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Self Care Practices among People with Type II Diabetes Mellitus in an Urban Area of Ernakulam, Kerala

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¹MPH Scholar; ²Assistant Professor, MD Community Medicine; ³Assistant Professor, MD Community Medicine, Amrita Institute of Medical Science, Kochi, Kerala

Abstract

Introduction: Diabetes prevalence has been rising more rapidly in middle- and low-income countries. In 2015, an estimated 1.6 million deaths were directly caused by diabetes worldwide. The Crude prevalence rate in the urban areas of India is thought to be 9%, while in Kerala it was estimated to be around 20%. Diabetes can be controlled and its consequences avoided with proper self-care practices. This study attempts to assess the current self-care practices among people with diabetes in a selected urban area of Ernakulam district.

Methodology: The cross sectional studies included 240 households, which were selected using systematic random sampling. Trained interns used a validated questionnaire – diabetes self-management questionnaire (DSMQ), to collect data. Self-care practices were assessed using a 16-item questionnaire. The scale score ranges from 0-10. People who obtained ≥6.67 were considered to have good self-care practices.

Results: Out of 99 people with type two diabetes mellitus in the survey, 68 answered Diabetic Self-care Management Questionnaire. Mean age of the study participants was 62.59 (SD +/-11.2). Majority of the respondents were males (57.4%). Overall 51% of people obtained high score (CI 39.13-62.87). In the sub domain scores 60.3% of people got low score in physical activity, and 54.4% people obtained low score in the domain of dietary care. People with higher education obtained higher scores compared to people with low educational background (p=<0.005).

Conclusion: The result of this study shows that the self-care behaviour among people with diabetes in urban areas of Ernakulam were poor in the domain of physical activity and dietary care. Non-compliance to diabetic management is expected to increase the complications and increase the cost of health care. A good diabetes self-management behaviour change communication program at the primary care level with emphasis on motivating good self-care behaviours are the need of the hour.

Keywords: Self care practices, Type II diabetes mellitus, Lifestyle modifications

Introduction

Prevalence of diabetes mellitus has been rising more rapidly in middle- and low-income countries. In 2015, worldwide an estimated 1.5 million deaths were directly caused by diabetes (¹). WHO projects that diabetes will be the 7th leading cause of death in 2030. The Crude prevalence rate in the urban areas of India is thought to be 9%, while in Kerala it was estimated to be around 20% (²).

Treatment of diabetes includes changes in lifestyle, most of which people with diabetes must provide for themselves on a daily basis. Self-management of diabetes involves a therapeutic regimen of a healthy diet, exercise, no smoking, low alcohol intake, glucose monitoring and medications. Good self-care practices...
have been found to be positively correlated with good glycaemic control, reduction of complications and improvement in quality of life\(^3\).

Majority of day-to-day care in diabetes is handled by patients or families. Managing the daily care of diabetes seems to be a challenging task for many patients. A recent study from an urban area of southern India had shown that good diet and exercise was being followed by only 29% and 19.5% of the patients with diabetes, respectively, blood sugar monitoring and drug adherence were better with prevalence of 70% and 79.8% \(^4\). With this background the present study was undertaken among people with type 2 diabetes in a community setting to assess the self-care practices regarding diabetes. Primary objective of the study was to assess the Self Care Practices among people with type II Diabetes Mellitus in an urban area of Ernakulam, Kerala. Secondary objective was to study the factors associated with good self-care practices among people with Type II Diabetes Mellitus.

**Materials and Method**

The Corporation of Kochi is the largest municipal corporation in Kerala both in area and population. This is the second most important port city in the western coast of India and is the commercial capital of the State. Primary health care system in City, like other urban areas in Kerala, was not well established and was functioning sub optimally with weak referral system and inadequate attention to public health till recently when 16 urban Primary Health Centres were set up in Kochi city under National Urban Health Mission.

A pilot project for prevention and control of Non Communicable Diseases was launched by the urban training centre of the Dept. of Community Medicine, Amrita Institute of Medical Sciences in 65\(^{th}\) division of Kochi Corporation. A community-based, cross-sectional survey was carried out from June to August 2017, in the area among people with Type 2 diabetes mellitus to assess the self-care practices that were followed by them.

The cross sectional study included 240 households, which were selected using systematic random sampling. Every 5\(^{th}\) house was visited to gather information regarding Non Communicable Diseases. Interview was conducted using structured questionnaires by trained social workers and interns. The present study pertains to people with type 2 Diabetes Mellitus. Permanent residents of the 65\(^{th}\) division those who were diagnosed to have type II Diabetes Mellitus were administered a second questionnaire to gather information regarding self-care practices. Questionnaire was an adapted version of 16-item Diabetes Self Management Questionnaire (DSMQ). DSMQ questionnaire allows the summation to a sum scale score as well as estimation of four subscale scores. The subscales were: Glucose Management, Dietary Control, Physical Activity and Hospital Care Use. The questionnaire was originally in English and was translated and back translated to and from Malayalam. The questionnaire was pilot tested before the actual start of the study. Critically ill persons who were unable to respond to the questions were excluded from the study. Houses were visited at least 2 times to administer the questionnaire to the diabetics. The data entry and analysis were performed using statistical software SPSS version 20. Quantitative variables were expressed as mean with standard deviation and qualitative variables as proportions. Scale scores were calculated as sums of item scores and then transformed to a scale ranging from 0 to 10 (raw score / theoretical maximum score * 10. A transformed score of ten thus represented the highest self-rating of the assessed behaviour. People who obtained ≥6.9 (mean value) out of 10 were considered to have higher score. Chi square test was used to test the statistical significance between proportions.

**Results**

Out of 99 people with type two diabetes mellitus in the survey, 68 answered Diabetic Self-care Management Questionnaire. Mean age of the study participants was 62.59 (SD +/-11.2). Majority of the respondents were males (57.4%). Majority of the study population belonged to Hindu religion (44.1%) and were married (86.8%). Among the participants, 38.2% were with higher educational qualification. Duration of diabetes was 10 years or more in 54% of participants (table1). Overall 51% of people obtained high score (CI 39.13-62.87). In the sub domain scores 60.3% of people got low score in physical activity, and 54.4% people obtained low score in the domain of dietary care. Of them 52.9%, patients got high score. People with higher education obtained higher scores as compared to people with low educational background (p=<0.005) (table 3).
### Table 1: Socio demographic details of participants

<table>
<thead>
<tr>
<th>SOCIODEMOGRAPHIC VARIABLES</th>
<th>N=68</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td></td>
</tr>
<tr>
<td>&lt;60YEARS</td>
<td>36(36.4%)</td>
</tr>
<tr>
<td>&gt;=60YEARS</td>
<td>63(63.6%)</td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>39(57.4%)</td>
</tr>
<tr>
<td>FEMALE</td>
<td>29(42.6%)</td>
</tr>
<tr>
<td>RELIGION</td>
<td></td>
</tr>
<tr>
<td>HINDU</td>
<td>30(44.1%)</td>
</tr>
<tr>
<td>CHRISTIAN</td>
<td>27(39.7%)</td>
</tr>
<tr>
<td>MUSLIM</td>
<td>11(16.2%)</td>
</tr>
<tr>
<td>EDUCATION</td>
<td></td>
</tr>
<tr>
<td>PRIMARY/MIDDLE/HIGHSCHOOL</td>
<td>42(61.8%)</td>
</tr>
<tr>
<td>DIPLOMA/DEGREE</td>
<td>26(38.2%)</td>
</tr>
<tr>
<td>OCCUPATION</td>
<td></td>
</tr>
<tr>
<td>PROFESSIONAL/UNSKILLED/SKILLED</td>
<td>30(44.1%)</td>
</tr>
<tr>
<td>HOMEMAKER/UNEMPLOYED/OTHERS</td>
<td>38(55.9%)</td>
</tr>
<tr>
<td>MARITAL STATUS</td>
<td></td>
</tr>
<tr>
<td>MARRIED</td>
<td>59(86.8%)</td>
</tr>
<tr>
<td>NOT MARRIED</td>
<td>2(3%)</td>
</tr>
<tr>
<td>WIDOW</td>
<td>7(10.3%)</td>
</tr>
<tr>
<td>FAMILY HISTORY</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>26(38.2%)</td>
</tr>
<tr>
<td>NO</td>
<td>42(61.8%)</td>
</tr>
</tbody>
</table>

### Table 2: Statistical description of sub domains of DSMQ questionnaire

<table>
<thead>
<tr>
<th></th>
<th>GLUCOSE MANAGEMENT</th>
<th>DIETARY CARE</th>
<th>PHYSICAL ACTIVITY</th>
<th>HEALTHCARE USE</th>
<th>OVERALL RATING</th>
<th>TOTAL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean(sd)</td>
<td>11.2(3.4)</td>
<td>8.1(2.7)</td>
<td>5.8(2.4)</td>
<td>5.82(1.9)</td>
<td>2.17(1.0)</td>
<td>6.9(1.7)</td>
</tr>
<tr>
<td>Median</td>
<td>12.0</td>
<td>7.5</td>
<td>6.0</td>
<td>6.0</td>
<td>3.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Minimum scores obtained</td>
<td>1.0</td>
<td>3.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.9</td>
</tr>
<tr>
<td>Maximum scores obtained</td>
<td>15.0</td>
<td>12.0</td>
<td>9.0</td>
<td>9.0</td>
<td>3.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

### Table 3: Association of factors with self care practices

<table>
<thead>
<tr>
<th></th>
<th>HIGH SCORE</th>
<th>LOW SCORE</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;60YEARS</td>
<td>10(43.5%)</td>
<td>13(56.5%)</td>
<td>.444</td>
</tr>
<tr>
<td>&gt;=60YEARS</td>
<td>25(55.6%)</td>
<td>20(60.6%)</td>
<td></td>
</tr>
</tbody>
</table>
Cont... Table 3: Association of factors with self care practices

<table>
<thead>
<tr>
<th>GENDER</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23(59.0%)</td>
<td>12(41.4%)</td>
</tr>
<tr>
<td></td>
<td>16(41.0%)</td>
<td>17(58.6%)</td>
</tr>
<tr>
<td>RELIGION</td>
<td>HINDU</td>
<td>CHRISTIAN</td>
</tr>
<tr>
<td></td>
<td>15(50.0%)</td>
<td>14(51.9%)</td>
</tr>
<tr>
<td></td>
<td>15(50.0%)</td>
<td>13(48.1%)</td>
</tr>
<tr>
<td></td>
<td>6(54.5%)</td>
<td>5(45.5%)</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>PRIMARY/MIDDLE/HIGHSCHOOL</td>
<td>DIPLOMA/DEGREE</td>
</tr>
<tr>
<td></td>
<td>16(38.1%)</td>
<td>19(73.1%)</td>
</tr>
<tr>
<td></td>
<td>26(61.9%)</td>
<td>7(26.9%)</td>
</tr>
<tr>
<td>MODE OF TREATMENT</td>
<td>TABLET</td>
<td>INSULIN</td>
</tr>
<tr>
<td></td>
<td>30(49.2%)</td>
<td>5(71.4%)</td>
</tr>
<tr>
<td></td>
<td>31(50.8%)</td>
<td>2(28.6%)</td>
</tr>
<tr>
<td>DURATION</td>
<td>&lt;10YRS</td>
<td>&gt;=10 YEARS</td>
</tr>
<tr>
<td></td>
<td>22(55.0%)</td>
<td>13(46.4%)</td>
</tr>
<tr>
<td></td>
<td>18(45.0%)</td>
<td>15(53.6%)</td>
</tr>
</tbody>
</table>

| .151 | .966 | .005 | .265 | .486 |

**Discussion**

Non-compliance to diabetic management is expected to increase the complications and increase the cost of health care. The current study provides a perspective from a community-based sample in Kerala regarding the diabetes self-care practices. Good diet and physical activity was being followed by only 45.6% and 39.7% of the study participants respectively. Education had found significant association (p=0.005) with self-care practices. There were very few community based studies in the aspects of self-care practices among diabetic people. In another community-based study to assess the prevalence of good diabetes self-care behaviour in an urban Southern Indian community, good diet and exercise was being followed by only 29% and 19.5% of the patients with diabetes. A facility-based cross-sectional study conducted in Government Winlock Hospital, Mangalore showed that self-care practices were found to be unsatisfactory in almost all aspects except for blood sugar monitoring and treatment adherence. A healthy eating plan on a daily basis was followed by 45.9% of the participants and daily exercises for 30 min were followed by 43.4% (5). In another community-based cross-sectional study in Rural Sullia, Karnataka, participants obtained low score in the domain of physical activity and only 19% of the study participants followed the recommended 20–30 min exercise per day for at least 5 days a week (6). The study self-care Practices among Diabetic Patients in Anand district of Gujarat showed less practice in dietary care and exercises (7). The higher compliance as compared to community based studies from other parts of the country could be due to the higher literacy rate and good health seeking behaviour of the people of Kerala. It could also be due to variations in the tools and definitions used in different studies to elicit compliance.

Blood samples were not analysed for HbA1c or other physiological measures so the relationship of good self-care practices and diabetes control could not have established by the study. Sample size was small and the collected data was based on self-report. Despite these limitations, this study has provided the foundation
for future studies among persons living with diabetes in relation to their diabetes management. Future study may use qualitative design to understand the barriers and facilitators to engage in diabetes self-care practices.

A practicing clinician should be able to identify persons at risk of noncompliance like Lower educational status and give extra attention to them to motivate self-care behaviours in them. From a public health point of view, the State needs good diabetes self-management education programmes at the primary care level with emphasis on motivating good self-care behaviours including lifestyle modification. Behaviour change communications should be continuous with enhancement of motivation to change and sustain the changes.

**Conclusion**

The result of this study shows that the self-care behaviour among people with diabetes in urban areas of Ernakulam were poor in the domain of physical activity and dietary care. A good diabetes self-management behaviour change communication program at the primary care level with emphasis on motivating good self-care behaviours including lifestyle modifications are the need of the hour.

**Conflict of Interest:** There are no conflicts of interest.

**Source of Funding:** Self

**Ethical Clearance:** The study has got ethical clearance from IRB of Amrita Institute Of Medical Sciences.

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**References**


Effect of Tailor Made Exercise Program in ACL Reconstruction of Knee Joint

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¹Physiotherapist, Faculty of Physiotherapy, ²Dean, Faculty of Physiotherapy, ³Assistant Professor, Krishna College of Physiotherapy, KIMS ‘deemed to be’ University, Karad, Maharashtra, India

Abstract

Introduction: ACL reconstructions have been reported to demonstrate a disproportionate loss of strength of quadriceps muscle. The effect of tailor made exercise program patient’s belief about exercise, experience of using exercise in daily management of ACL rehabilitation program.

Objectives: The objective is to evaluate the effect of tailor made exercise program on pain, to determine effectiveness of tailor made exercise program on muscle strength, and the effectiveness of tailor made exercise program on lower extremity function scale.

Method: A comparative study was conducted at Physiotherapy Department of Krishna Institute of Medical Sciences. A total of 60 subjects were equally divided into two groups by lottery method. Group A was given tailor made exercise program, Group B was given conventional rehabilitation program.

Results: Statistical analysis was done by paired t test and unpaired t test. p values for manual muscle testing, Numerical pain rating scale, lower extremity function scale were calculated. While comparing the post-interventional values of manual muscle testing, Numerical pain rating scale, lower extremity function scale, the result revealed that tailor made exercise program is effective.

Conclusion: From the study it can be concluded that, tailor made exercise program is significantly effective in improving muscle strength and lower extremity function.

Keywords: ACL; Reconstruction, rehabilitation, tailor made exercise.

Introduction

ACL tear

ACL tear is a relatively common sporting injury affecting the knee and is characterized by tearing of the Anterior Cruciate Ligament (ACL), an important stabilizing structure of the knee. It is typically caused by twisting the knee beyond its normal limits (hyperextension) and forward movement of the tibia on the femur. When these movements are excessive and beyond what the ACL can withstand, tearing to the ACL occurs. This condition is known as an ACL tear and may range from a small partial tear resulting in minimal pain, to a complete rupture of the ACL resulting in significant pain and disability, requiring comprehensive rehabilitation and potentially surgery.

Causes

Anterior cruciate ligament (ACL) injuries are caused when the knee is straightened beyond its normal limits (hyperextended), twisted, or bent side to side.
Typical situations that can lead to ACL injuries include:

Changing direction quickly or cutting around an obstacle or another player with one foot solidly planted on the ground. (This can happen in sports that put high demand on the ACL, such as basketball, football, soccer, skiing, and gymnastics.)

Landing after a jump with a sudden slowing down, especially if the leg is straight or slightly bent (such as in basketball).

Falling off a ladder, stepping off a curb, jumping from a moderate or extreme

**Mechanisms of Injury / Pathological Process**

Three major types of ACL injuries are described: 

- **Direct Contact**: 30% of the cases
- **Indirect Contact**
- **Non-Contact**: 70% of the cases: by doing a wrong movement 

Smaller size and different shape of the intercondylar notch. A narrow intercondylar notch and a plateau environment are risk factors of predisposing female non-athletes with knee OA to ACL injury aged 41-65 years.

Wider pelvis and greater Q angle. A wider pelvis requires the femur to have a greater angle towards the knee, lesser muscle strength provides less knee support, and hormonal variations may alter the laxity of ligaments.

Greater ligament laxity. Young athletes with no modifiable risk factors like ligament laxity are at a particularly increased risk of recurrent injury following ACL reconstruction (ACLR).

Shoe surface interface. The pooled data from the three studies suggest that the chances of injury are approximately 2.5 times higher when higher levels of rotational traction are present at the shoe-surface interface.

Neuromuscular factors Risk factors for ACL injuries include environmental factors (e.g. high level of friction between shoes and the playing surface) and anatomical factors (e.g. narrow femoral intercondylar notch).

**Tailor made exercise program:**

Exercise intervention can be defined as a range of physical activities involving muscular contraction and repetitive bodily movement that is planned, structured, and purposely aimed at improving one or more components of physical fitness.

Exercise intervention is a general concept that can have many variations such as different

- Modes (e.g., various types of exercises), dosages (e.g., intensity, duration, frequency), and delivery methods (e.g., individualized, class-based, home-based).
- Aerobic exercise, strengthening exercise, flexibility exercise, and neuromuscular training

Such as agility and perturbation training should be prescribed to people with ACL Reconstruction.

In ACL reconstruction, priority of exercise prescription should be given to regain the client’s

- Knee flexibility, muscle strength, and neuromuscular control, as these impairments are the primary causes
- Of difficulties in physical functioning.

We rarely hear about tailor made exercise programs. Now, we can agree that some physical activity is better than no activity but there is NOT ONE pre-formatted program that will meet everyone’s unique needs.

A 100% Tailor Made Program from a true health and fitness professional is the only acceptable path forward.

Strength training by tailor made program does promote neural and muscular adaptations that are complementary to the well-known effects of voluntary resistance training.”

**Materials and Method**

A experimental study was conducted in and around hospitals of karad, following a simple random sampling technique on a sample size of 60. The participants were divided into 2 groups. The study protocol was started after being approved by institutional ethical committee of Krishna Institute of Medical Sciences Deemed To Be University, Karad. Subjects were selected according to inclusion criteria. Written informed consent was taken and the whole study was explained to them. Each
subject was assessed for strength of muscles, intensity of pain and activity limitation by using, manual muscle testing, and Numeric Pain Rating Scale and lower extremity function scale. The equipments used were (1) continue passive movement (cpm). (2) Theraband, (3) muscle stimulator. Inclusion criteria was as follows: (1) Age group between 18-40 year. (2) Patients after ACL reconstruction with Bone Patellar Tendon Bone (BPTB) graft. (3) Males and females are both. Exclusion criteria was as follows: (1) patients with associated fracture, injuries and dislocation. (2) patients having systemic disease, neurological disorder (3) any serious uncontrolled medical disease.

Group A: experimental group

In experimental group 30 subjects will be given:

Experimental Group

Tailor made exercise program

After post-operative ACL reconstruction there is pain and inflammation occurs so patients given ice application and continues passive motion (CPM). Then strengthening exercise phase wise protocol given to patients.

Group B: control group

30 subjects will be given only conventional physiotherapy protocol.

The conventional physiotherapy protocol is divided into 3 phases and each phase includes various exercises which is given to the patients.

All outcome measure were assessed before starting and at the end of treatment.

Result

Table 1: Comparison of Pre test and Post test scores in Experimental Group

(Paired ‘t’ test)

<table>
<thead>
<tr>
<th>Lower Extremity Functional Scale (LEFS)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>30</td>
<td>18.63</td>
<td>5.83</td>
<td>45.34</td>
<td>0.00</td>
</tr>
<tr>
<td>Post test</td>
<td>30</td>
<td>82.58</td>
<td>8.23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manual Muscle Testing (MMT)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>30</td>
<td>2.86</td>
<td>0.73</td>
<td>15.62</td>
<td>0.00</td>
</tr>
<tr>
<td>Post test</td>
<td>30</td>
<td>4.56</td>
<td>0.56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numerical Pain Rating Scale( NPRS)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>30</td>
<td>5.83</td>
<td>1.14</td>
<td>7.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Post test</td>
<td>30</td>
<td>3.20</td>
<td>1.37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With Lower Extremity Functional Scale (LEFS), p value less than 0.05 shows that there was significant difference in the pre test and post test scores, in experimental group.

P value less than 0.05 shows that there was significant difference in the in the pre test and post test scores, in experimental groups with Manual Muscle Testing (MMT) and numerical Pain Rating Scale( NPRS)
Concludes that treatment, effect of tailor made exercise program was effective.

Table 2: Comparison of Pre test and Post test scores in Control Group  
(Paired ‘t’ test)

<table>
<thead>
<tr>
<th>Lower Extremity Functional Scale (LEFS)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>30</td>
<td>19.17</td>
<td>8.59</td>
<td>43.34</td>
<td>0.00</td>
</tr>
<tr>
<td>Post test</td>
<td>30</td>
<td>75.42</td>
<td>10.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manual Muscle Testing (MMT)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>30</td>
<td>2.70</td>
<td>0.59</td>
<td>18.92</td>
<td>0.00</td>
</tr>
<tr>
<td>Post test</td>
<td>30</td>
<td>4.53</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numerical Pain Rating Scale (NPRS)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>30</td>
<td>7.03</td>
<td>1.06</td>
<td>11.16</td>
<td>0.00</td>
</tr>
<tr>
<td>Post test</td>
<td>30</td>
<td>4.13</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With Lower Extremity Functional Scale (LEFS), p value less than 0.05 shows that there was significant difference in the pre test and post test scores, in control group.

P value less than 0.05 shows that there was significant difference in the in the pre test and post test scores, in experimental groups with Manual Muscle Testing (MMT) and numerical Pain Rating Scale (NPRS)

Concludes that treatment, with only conventional physiotherapy was effective.

Table 3: Comparison of the post test scores in Experimental Vs. Control Group  
(Unpaired t test)

<table>
<thead>
<tr>
<th>Lower Extremity Functional Scale (LEFS)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>30</td>
<td>82.58</td>
<td>8.23</td>
<td>2.91</td>
<td>0.01</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>75.40</td>
<td>10.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manual Muscle Testing (MMT)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>30</td>
<td>4.56</td>
<td>0.56</td>
<td>0.24</td>
<td>0.81</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>4.53</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numerical Pain Rating Scale (NPRS)</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>30</td>
<td>3.20</td>
<td>1.37</td>
<td>3.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>4.13</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
With Lower Extremity Functional Scale (LEFS), p value less than 0.05 shows that there was significant difference in the post test scores, of experimental and control groups.

With Manual Muscle Testing (MMT), p value more than 0.05 shows that there was no significant difference in the post test scores, of experimental and control groups.

P value less than 0.05 shows that there was significant difference in the in the post test scores, of experimental and control groups with numerical Pain Rating Scale (NPRS).

**Discussion**

In this study, sample of 60 subjects were drawn from the study population. The data were collected to describe the sample characteristics with demographic variables like age and gender. The sample was divided in to two groups, one experimental group of 30 subjects given tailor made exercise program. Other control group of 30 subjects treated with only conventional physiotherapy protocol.

In case of experimental group most of them 43.33% were between 26-30 years of age group, 26.67% between 21-25 years, 20% belonged to 31-35 age groups and 6.67% between 36-40 age group and remaining 3.33% in age group 15-20 years with 66.67% were male and remaining 33.33% were female. In case of control group most of them 36.67% were between 26-30 years of age group, 23.33% between 21-25 years, 20% belonged to 31-35 and 36-40 age groups with 60.00% were male and remaining 40.00% were female.

The Numerical Pain Rating Scale (NPRS) is a segmented numeric version of the visual analogue scale (VAS) in which a respondent selects a whole number (0–10 integers) that best reflects the intensity of his/her pain. It is a one-dimensional measure of pain intensity in adults, including those with chronic pain. High test–retest reliability has been observed in both literate and illiterate patients (r = 0.96 and 0.95) for construct validity, the NPRS was shown to be highly correlated with the VAS correlations range from 0.86 to 0.95.

Manual muscle testing (MMT) is a method of using the strength and response of a muscle to test function in the body. MMT (Medical Research Council score) Score ranges between 0-5, minimum 0, maximum 5/5. (r = 0.78)

The Lower Extremity Functional Scale (LEFS) is a questionnaire containing 20 questions about a person’s ability to perform everyday tasks. The LEFS can be used by clinicians as a measure of patients’ initial function, on-going progress and outcome, as well as to set functional goals. The LEFS reliability was 0.94 can be used to evaluate the functional impairment of a patient with a disorder of one or both lower extremities. It can be used to monitor the patient over time and to evaluate the effectiveness of an intervention.

The average pre-test score with the Numerical Pain Rating Scale (NPRS) in case of experimental group was 5.83 and in case of post-test was 3.20 & in case of control group was 7.03 and in case of post-test was 4.13.

The average pre-test score with the Manual muscle testing (MMT) in case of experimental group was 2.86 and in case of post-test was 4.56 & in case of control group was 2.70 and in case of post-test was 4.53.

The average pre-test score with the Lower extremity functional scale (LEFS) in case of experimental group was 18.63 and in case of post-test was 82.58 & in case of control group was 19.17 and in case of post-test was 75.42.

Comparison of Pre-test and Post test scores in Experimental Group & control group with Lower Extremity Functional Scale (LEFS), p value less than 0.05 shows that there was significant difference.

Inter group comparison with Lower Extremity Functional Scale (LEFS), p value less than 0.05 shows that there was significant difference in the post test scores, of experimental and control groups with numerical Pain Rating Scale (NPRS).

P value less than 0.05 shows that there was significant difference in the in the post test scores, of experimental and control groups with Lower Extremity Functional Scale (LEFS), p value less than 0.05 shows that there was significant difference in the post test scores, of experimental and control groups with numerical Pain Rating Scale (NPRS).

The statistical analysis shows insignificant result for all scales (p<0.05) except one result for LEFS. The electrical stimulation (NMES/SDIDC) in conjunction
with conventional rehab protocol shows no significant difference. Though Eriksson et al (1979), Delitto et al (1988) studied and found that electrical stimulation prevent the muscle atrophy after major knee ligament surgery. They concluded that tailor made exercise program helped to improve torque generating capability of the knee satiability after operation on the knee ligaments but the fact is those finding were qualified by isokinetic apparatus not by the functional parameters. The present study had some limitation that must be considered. The sample size considered for the study was small so generalizations are difficult. It would be of interest to evaluate the effectiveness of regular application of NMES to investigate whether an application of tailor made exercise program has a beneficial effect.

Conclusion

This study was undertaken to evaluate the effect of tailor made exercise programme in ACL reconstruction of knee joint.

GROUP A received tailor made exercise program and GROUP B received conventional physiotherapy program.

The outcome measure used were NPRS for intensity of pain, MMT used for muscle strength and lower extremity function scale used for daily living activity.

Statistical analysis was done using INSTAT software. Nonparametric paired and unpaired t test used for within the group and between the group analyses.

Thus, from the above study it concludes that patients in group A with ACL reconstruction of knee joint showed significant improvement in NPRS, MMT, LEFS clinically and statistically than group B.

This study accepts alternative hypothesis.

Conflict of Interest: This study can be carried out with tailor made exercise program activities, periodic assessment of outcome measures, comparison can be done between male and female subjects, study can be done with larger sample size.

Ethical Clearance: Ethical clearance was taken from institutional committee of Krishna institute of medical science, deemed University,Karad.

Source of Funding: Source of funding is Krishna institute of medical sciences deemed University,Karad.

References

Assessment of Musculoskeletal Problems among Women IT Professionals

Sivapriya KR¹, Pankaj B Shah², Palani Gopal³

¹Assistant Professor of Community Medicine, Tagore Medical College, Chennai, ²Professor and Head, Department of Community Medicine, Sri Ramachandra Medical College & Research Institute, Sri Ramachandra University

Abstract

Introduction: India is a developing economy and IT industry is a major contributor for India’s industrial and economic growth. The prevalence of computer users are exponentially increasing with years, and as a result of the duration and intensity of exposure to computers, the health problems related to prolonged computer use are also on the rise. This study was done to evaluate the musculoskeletal problems among women IT professionals.

Methodology: This cross sectional study was carried out among 609 women with over one year of experience working in one of the large projects in a software company in Chennai. Data collection comprised of work related history, questions related to self reported symptoms of musculoskeletal problems and symptoms of carpal tunnel syndrome. Wong-Baker faces scale was used to assess the severity of pain. Clinical examination was carried out by the investigator to look for the signs of carpal tunnel syndrome namely phalen’s sign and tinel’s sign.

Results: The mean age of the participants was 24.9 years. Over 57.2% had a work experience <3 years. Musculoskeletal problems were present in 73.1% of the participants. Carpal tunnel syndrome was present among 6.1% of the participants. Software developers were significantly at risk of musculoskeletal problems (p<0.05)

Conclusion: The high prevalence of musculoskeletal problems emphasizes the need for continuous, motivational, on site health education and rehabilitative measures to prevent the impact of these problems on the quality of life.

Keywords: Carpal Tunnel Syndrome, Musculoskeletal problems, Software professionals

Introduction

In today’s world, computers have become an essential commodity in day to day life. All the industries are dependent on computers. The role of Information Technology (IT) professionals becomes very crucial in every economic infrastructure of today’s world. According to National Association of Software and Service Companies (NASSCOM), the demand of IT professionals is on the rise. Around one million computer professionals are graduating from various courses every year. As computers have become a vital tool in every dimension and backbone of today’s occupational and non-occupational settings, the number of computer users is rising exponentially worldwide and is expected to exceed 1 billion in 2010.¹

The hazards of long term computer use are many. Their jobs are more sedentary, requiring more cognitive processing, mental attention, though requiring less expenditure of energy.² Continuous exposure to computer can lead to problems like musculoskeletal disorders, computer vision syndrome and psychological problems. In a study done in Delhi, the computer related morbidity was present in 93% and the prevalence of musculoskeletal problems was 77.5%. The females had more problems (96.7%) comparing to males (91.3%).³
Studies by various international medical research institutes showed that 80-90% of people who use computers regularly are likely to suffer from health problems. ASSOCHAM (Association of Chambers of Commerce, India) analyzed the issue through their study and it was revealed that 68% of the working females between 21-52 years were found to be afflicted to lifestyle disease such as obesity, depression, chronic backache, diabetes, hypertension etc.4

A rapidly growing sector, its sustainability depends on the welfare of its workers. An in-depth assessment of the burden of musculoskeletal problems will help in streamlining the health care services for this sector, with a special focus on prevention and rehabilitation, will help raising this awareness.5

Objectives
• To estimate the prevalence of musculoskeletal problems among women IT professionals
• To evaluate the risk factors associated with musculoskeletal problems

Methodology

Study setting

This study was carried out as a cross sectional study in an IT company located at Siruseri, Chennai, over a period of four months.

Study population

The study population comprised of women IT professionals working in the IT company. A total of 12,000 software professionals working on various projects in the IT company. Permission was granted for conducting the study in 22 projects.

Sample size and sampling

With the available literature, the prevalence of wrist pain among computer professionals was 23%6 and with a limit of accuracy as 15% of anticipated prevalence and with Zα value of 1.96, the sample size calculated was 572. Accounting 5% for refusal rates, the final sample size was calculated as 602.

Out of the 22 projects, in four projects the number of women employees was more than 1000. Amongst these four projects one project was selected by simple random sampling, using the table of random numbers, which consisted of 703 women who had worked in the company for over a year. Amongst them, 609 women consented for the study.

Inclusion criteria

Women IT employees
Minimum one year experience.

Exclusion criteria

Pregnant and lactating women were excluded.

Ethical approval and informed consent

Approval from the Institutional Ethics Committee was obtained. The participants were explained in detail about the study and informed consent was obtained prior to the data collection.

Data collection tools

A structured questionnaire was developed consisting of questions related to background information, details of work including working hours with computer; work experience in IT, type of breaks availed during working hours. Questions related to self reported symptoms of musculoskeletal problems and symptoms of carpal tunnel syndrome. Wong-Baker faces scale was used to assess the severity of pain.7

Clinical examination was carried out by the investigator to look for the signs of carpal tunnel syndrome namely phalen’s sign and tinel’s sign and examination of joints only for the participants having pain for tenderness, rigidity, swelling and range of movements.8,9

Body mass index and waist hip ratio were measured to assess the obesity.10 The assessment of physical activity was done using International Physical Activity Questionnaire Short form.11

The questionnaire was pretested on 30 participants from a different project to test the validity. The results of pre-test are not included in the analysis.

Data analysis

Data entry and analysis of the variables was done using Statistical Package for Social Sciences (SPSS) version 16 software. The prevalence of musculoskeletal
problems were computed as percentages. Chi square test was used to analyze the statistical significance of risk factors.

**Results**

This study was carried out among 609 women IT employees. The Mean age of the study participants was 24.9 ± 2.1 years. Majority of the study population were undergraduates 466 (76.5%) and 512 (84.1%) were living in nuclear families. The background characteristics of the participants are described in Table - 1.

The details of role, work experience, working hours with computer are given in Table - 2. Most of the women, 556 (91.3%) were working as software developers. Among the study subjects, 349 (57.2%) had less than 3 yrs of total IT experience. The mean duration of working with computers in office was 9 ± 1.29 hours. About 527 (86.5%) avail breaks during working hours.

The overall prevalence of musculoskeletal problems among the study participants was 73.1% (95%CI-69.6-76.6). (Figure 1) The most commonly reported musculoskeletal problems were low back pain in 235 (38.6%) women and 228 (37.4%) women had neck pain. Shoulder/arm pain was reported by 177(29%) women. The other musculoskeletal problems reported were knee pain 95(15.6%), hand pain including fingers 75(12.3%), wrist pain in 62(10.2%) women and foot pain 61(10%).

The low back pain was severe among 29(12.3%) and neck pain among 24(10.5%). Those reported shoulder/arm pain 22(12.4%) experiencing severe pain. Among the study subjects, 63(14.2%) women were found to suffer from any one severe pain. (table-3) About 37 women had Carpal Tunnel Syndrome with a prevalence of 6.1% (95% CI 4.2 to 8.0). All the women, 37(6.1%) had phalen’s sign positive and 25(4.1%) women had positive tinel’s sign.

Among the study subjects, software developers were found to have more musculoskeletal problems(74.3%) with an odds ratio of 1.90 (95%CI: 1.02-3.52) compared to project leaders (60.4%) [ value 4.753, p = 0.029]. Subjects having 6 years or more work experience in IT had more musculoskeletal problems (76.3%) than the subjects with less than 6 years work experience (72.6%). (Table 4)

**Table 1: Background Characteristics of the study participants**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Background characteristics</th>
<th>No. of Women(n=609)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age group in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-25 yrs</td>
<td></td>
<td>331</td>
<td>54.4</td>
</tr>
<tr>
<td>25-29 yrs</td>
<td></td>
<td>239</td>
<td>39.2</td>
</tr>
<tr>
<td>29 yrs and above</td>
<td></td>
<td>39</td>
<td>6.4</td>
</tr>
<tr>
<td>2.</td>
<td>Educational qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate</td>
<td></td>
<td>466</td>
<td>76.5</td>
</tr>
<tr>
<td>Postgraduate</td>
<td></td>
<td>143</td>
<td>23.5</td>
</tr>
<tr>
<td>3.</td>
<td>Type of family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td></td>
<td>512</td>
<td>84.1</td>
</tr>
<tr>
<td>Joint/Others</td>
<td></td>
<td>97</td>
<td>15.9</td>
</tr>
<tr>
<td>4</td>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>464</td>
<td>76.2</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td>145</td>
<td>23.8</td>
</tr>
<tr>
<td>Separated/divorce/widow/cohabiting</td>
<td></td>
<td>0</td>
<td>-</td>
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</tbody>
</table>
Table 2: Employment Profile of the study participants

<table>
<thead>
<tr>
<th>S. no</th>
<th>Particulars</th>
<th>No. of Women(n=609)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Role in project</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Software developer</td>
<td>556</td>
<td>91.3</td>
</tr>
<tr>
<td></td>
<td>Project leader</td>
<td>53</td>
<td>8.7</td>
</tr>
<tr>
<td>2.</td>
<td>Details of work experience (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 years &amp; above</td>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>6-9 yrs</td>
<td>74</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>3-6 yrs</td>
<td>180</td>
<td>29.6</td>
</tr>
<tr>
<td></td>
<td>&lt;3 yrs</td>
<td>349</td>
<td>57.2</td>
</tr>
<tr>
<td>3.</td>
<td>Travel time to office</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Up to 1hr</td>
<td>261</td>
<td>42.9</td>
</tr>
<tr>
<td></td>
<td>2-3hrs</td>
<td>302</td>
<td>49.6</td>
</tr>
<tr>
<td></td>
<td>4hrs and above</td>
<td>46</td>
<td>7.5</td>
</tr>
<tr>
<td>4.</td>
<td>Working hours/day with computer in office</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 hrs and above</td>
<td>159</td>
<td>26.1</td>
</tr>
<tr>
<td></td>
<td>&lt; 10 hrs</td>
<td>450</td>
<td>73.9</td>
</tr>
</tbody>
</table>

Table 3: Musculoskeletal problems according to severity

<table>
<thead>
<tr>
<th>S. no</th>
<th>Musculoskeletal problems</th>
<th>No. of Women</th>
<th>Mild n (%)</th>
<th>Moderate n (%)</th>
<th>Severe n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low Back pain (n=235)</td>
<td></td>
<td>63 (26.8)</td>
<td>143 (60.9)</td>
<td>29 (12.3)</td>
</tr>
<tr>
<td>2.</td>
<td>Neck pain (n=228)</td>
<td></td>
<td>78 (34.2)</td>
<td>126 (55.3)</td>
<td>24 (10.5)</td>
</tr>
<tr>
<td>3.</td>
<td>Shoulder/arm pain (n=177)</td>
<td></td>
<td>62 (35.1)</td>
<td>93 (52.5)</td>
<td>22 (12.4)</td>
</tr>
<tr>
<td>4.</td>
<td>Knee pain (n=95)</td>
<td></td>
<td>28 (29.5)</td>
<td>62 (65.3)</td>
<td>5 (5.2)</td>
</tr>
<tr>
<td>5.</td>
<td>Hand/finger pain (n=75)</td>
<td></td>
<td>40 (53.3)</td>
<td>32 (42.7)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>6.</td>
<td>Wrist pain (n=62)</td>
<td></td>
<td>29 (46.8)</td>
<td>27 (43.5)</td>
<td>6 (9.7)</td>
</tr>
<tr>
<td>7.</td>
<td>Foot pain (n=61)</td>
<td></td>
<td>27 (44.3)</td>
<td>33 (54.1)</td>
<td>1 (1.6)</td>
</tr>
<tr>
<td>8.</td>
<td>Elbow/forearm (n=23)</td>
<td></td>
<td>9 (39.1)</td>
<td>12 (52.2)</td>
<td>2 (8.7)</td>
</tr>
</tbody>
</table>

Table 4: Association between various factors and musculoskeletal problems

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Musculoskeletal problems</th>
<th>Chi-square value</th>
<th>P value</th>
<th>Odds Ratio</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Role in project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Software developer(n=556)</td>
<td>413 (74.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project leader(n=53)</td>
<td>32 (60.4%)</td>
<td>4.753</td>
<td>0.029</td>
<td>1.90</td>
<td>1.02-3.52</td>
</tr>
<tr>
<td>2.</td>
<td>Details of work experience (in years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>6 years and above(n=80)</td>
<td>61 (76.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;6 years (n=529)</td>
<td>384 (72.6%)</td>
<td>0.47</td>
<td>0.49</td>
<td>1.21</td>
<td>0.68-2.18</td>
</tr>
</tbody>
</table>
### Table 4: Association between various factors and musculoskeletal problems

<table>
<thead>
<tr>
<th>3.</th>
<th>Working hours/day with Computers in office</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 hrs &amp; above (n=159)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>(76.1%)</td>
</tr>
<tr>
<td></td>
<td>&lt; 10 hrs (n=450)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>324</td>
</tr>
<tr>
<td></td>
<td>(72%)</td>
</tr>
<tr>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>0.316</td>
</tr>
<tr>
<td></td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>0.80-1.92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.</th>
<th>Working hours/day with computer in office with breaks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 hrs &amp; above (n=129)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(77.5%)</td>
</tr>
<tr>
<td></td>
<td>&lt; 10 hrs (n=398)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>288</td>
</tr>
<tr>
<td></td>
<td>(72.4%)</td>
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<tr>
<td></td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>0.248</td>
</tr>
<tr>
<td></td>
<td>1.32</td>
</tr>
<tr>
<td></td>
<td>0.81-2.16</td>
</tr>
</tbody>
</table>

Figure 1: Prevalence of various musculoskeletal problems

**Discussion**

More than 2.5 million people are employed in IT sector either directly or indirectly, making it one of the biggest job creators in India. This has led to the new genre of occupational health problems. It was observed by other studies done among men and women IT professionals resulted with very high computer related morbidity.

In the current study, the mean age of the participants was 24.96 years. The study population was similar to studies done by Bakthiar and Sharma A and Talwar et al. Majority of the women, 84.1% were living in nuclear family and 23.8% were married. Only 8.7% were in the project lead role while 91.3% of subjects were software developers. Talwar et al, Branda et al and Bakthiari et al also had similar findings. In the present study, the average working hours per day with computer in office were 9±1.29 hours and 26.1% were found working more than 10 hours. The working hours were similar when compared to other studies. Nearly 50% were working with computer at home. A study done by Mohamed et al. in Chennai reported similarly. In the current study, it was found that only 17.9% women were in the high level of physical activity. This is probably due to their sedentary lifestyle.

In the present study, the prevalence of musculoskeletal problems was 73.1%. The common musculoskeletal problems reported by the subjects were low back pain (38.6%), neck pain (37.4%), shoulder/arm pain (29%) and hand pain including fingers (12.3%). This observation is in accordance with study done by Talwar et al. A study done in Delhi study also reported similar findings. It was also found that low back pain was more prevalent (38.6%). A study done in Kolkata by Banibra et al also reported similarly.

The second commonly reported musculoskeletal problem was neck pain (37.4%). In a study done in Finland by Korhonen et al. the incidence of local neck pain reported was also 34.4%. In the current study, pains perceived by the participants with high severity were low back pain, neck pain and shoulder/arm pain. In Mauritius, Subratty et al. reported similar findings. In the present study, the prevalence of carpal tunnel syndrome was 6.1%. Similar results were found in a study done by Mohamed Ali et al.

It was found that the musculoskeletal problems were more (74.3%) common among software developers compared to project leaders (60.4%) [OR=1.9; p=0.029], and also with work experience ≥ 6 years (76.3%) [OR=1.2; p=0.49]. Sharma et al showed similar results.

**Conclusion**

Musculoskeletal problems are morbid health problems among women, and its impact on quality of life is severe, when it is induced occupationally. This study elucidates the need for occupational safety and rehabilitative measures, complemented with continuous onsite motivation and health education as a part of a
larger policy implementation.

**Conflict of Interest** – None

**Funding** – None

**Ethical approval** – Obtained

**References**

1. NASSCOM. India’s software industry: The people’s dimension. [Internet]. 2009 [cited July 2009]. Available from: http://www.nasscom.org/


Evaluation of Serum Biomarkers to Assess Health Status in Urban Traffic Police Personnel

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Abstract

Traffic police personnel face multiple occupational hazards as they are continuously exposed to vehicular emissions and work in a noisy, polluted environment. The objective of the present study is to explore the impact of air pollution on health of traffic police, by evaluation of serum biomarkers.

The study population included 200 traffic police who worked outdoor on roads with heavy flow of vehicles and who were exposed to pollutants. 50 age and sex matched healthy subjects who worked indoor were considered as controls. Further, the traffic police group was subdivided into 4 groups based on the number of years of their exposure to urban pollutants. Group I included subjects with less than 5 years of exposure, Group II 6 to 10 years, Group III 11 to 20 years and group IV more than 20 years.

Biochemical parameters like glucose, cholesterol, bilirubin and other markers of liver function and renal function were estimated in fasting blood samples using spectrophotometric methods. 37% of the traffic police were pre-diabetic and 10% were diabetic. Hypercholesterolemia in police strongly suggest the risk of cardiovascular diseases. Significantly elevated total bilirubin, direct and indirect bilirubin levels in police indicate the prevalence of sub clinical jaundice. Further, increased serum transaminases demonstrate mild hepatocellular damage. Albumin globulin ratio decreased with the increase in duration of exposure to pollution within the police sub groups. Markedly high urea may be a sign of renal dysfunction in police personnel. Uric acid, the latest marker of pre-diabetes and insulin resistance, increased steadily from group I to IV along with glucose. The current study emphasizes the need for regular health checkups and create awareness regarding early diagnosis of organ dysfunction by investigation of biomarkers in police personnel.

Keywords: Traffic Police, Air pollution Liver function tests, Renal function tests, Diabetes mellitus

Introduction

Police personnel, the law enforcement authority of the society, are always under stress as they deal with unique shock situations and psycho social stressors¹. Traffic police on an average work almost eight hours per day. In addition to various stressors, they are exposed to various chemical pollutants like lead, sulfur dioxide, carbon monoxide, manganese, methanol which can cause biochemical alterations in blood cells, lungs, detoxifying organ like liver². Urbanization, increased automobile usage and traffic noise not only affects physical and mental health but may be a key factor in pathogenesis of several diseases³. Though recruitment of police is based on physical fitness, regular health checkups are seldom done throughout their career. Majority of studies on policemen, are on decreased lung function and increased respiratory morbidity due to vehicular emissions rich in benzene and other aromatic hydrocarbons⁴. To date most studies have focused on risk factors related to work environment in developed countries. Data are scarce for developing country like India where diabetes burden is very high and air pollution is on a rise. Hence, the
The aim of the present study is to assess the health status of police by estimation of various biochemical markers in the blood that would determine the subclinical organ dysfunction.

**Materials and Method**

The study population included 200 traffic police who worked outdoor on roads with heavy flow of vehicles, and who were exposed to pollutants. 50 age and sex matched healthy subjects who worked indoor were considered as controls. Further, the traffic police group was subdivided into 4 groups based on the number of years of their exposure to urban pollutants. Group I included subjects with less than 5 years of exposure, Group II 6 to 10 years, Group III 11 to 20 years and group IV more than 20 years of exposure to pollutants. Habitual smokers, alcoholics and subjects with systemic illness were excluded from the study. Informed consent was collected from all the participants along with a standardized questionnaire on food habits and personal details.

Fasting blood sample was collected in fluoride vacutainer for glucose estimation and rest in plain vacutainer for the estimation of biomarkers to assess liver and kidney functions. Analysis was carried out immediately in Cobas 6000 chemistry analyzer using spectrophotometric methods. Data was analyzed statistically using student t test and intergroup comparison was done by ANOVA followed by post hoc Tukey’s multiple comparison. The difference of p < 0.05 was considered significant.

**Results**

Fasting blood glucose (FBG) level of 37% of the traffic police was in pre-diabetic range and 10% in diabetic range, which was significantly higher compared to healthy controls. Serum creatinine levels remained unaltered in police compared to normal individuals, although urea and uric acid were significantly higher than controls. Total bilirubin, direct and indirect bilirubin levels were significantly elevated in police (p<0.01) compared to healthy controls. 68% of the traffic police had elevated conjugated bilirubin. Both the hepatic enzymes ALT and AST were also elevated in police, the increase was statistically significant. However, ALP and total proteins, albumin and globulins remained normal in the study group. Total cholesterol was significantly high in police group compared to normal. (Table 1)

FBG levels in group III and group IV were significantly higher than group I with statistical significance of p<0.001 and p<0.05 respectively. Serum uric acid level steadily increased from group I to group IV. The difference between group III and group IV were highly significant (p<0.03). Total bilirubin and unconjugated bilirubin levels steadily increased with number of years of exposure to pollutants. Bilirubin values in Group IV was significantly higher than Group I (p<0.05). Further, albumin levels and A/G ratio steadily decreased from Group I to Group IV, and the difference between group I and group III & IV were statistically significant (p<0.05). (Table 2)

<table>
<thead>
<tr>
<th>Table 1: Comparison of serum biomarkers in normal and police personnel (Mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal</strong> (n=100)</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Fasting Blood Glucose (mg %)</td>
</tr>
<tr>
<td>Urea (mg %)</td>
</tr>
<tr>
<td>Creatinine (mg %)</td>
</tr>
<tr>
<td>Uric acid (mg %)</td>
</tr>
<tr>
<td>Total cholesterol (mg %)</td>
</tr>
<tr>
<td>Total bilirubin (mg %)</td>
</tr>
<tr>
<td>Direct bilirubin (mg %)</td>
</tr>
<tr>
<td>Indirect bilirubin (mg %)</td>
</tr>
</tbody>
</table>
Table 2: Comparison of serum biomarkers in normal and police personnel (Mean ± SD)

<table>
<thead>
<tr>
<th></th>
<th>Group I (n=49)</th>
<th>Group II (n=61)</th>
<th>Group III (n=48)</th>
<th>Group IV (n=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBG (mg %)</td>
<td>97.95 ± 17.39</td>
<td>99.48 ± 14.15</td>
<td>125 ± 56.09**#</td>
<td>118.12 ±29.61*</td>
</tr>
<tr>
<td>Urea (mg %)</td>
<td>19.69 ± 5.15</td>
<td>21.33± 7.04</td>
<td>21.39 ± 7.06</td>
<td>21.66± 5.97</td>
</tr>
<tr>
<td>Creatinine (mg %)</td>
<td>0.9 ± 0.12</td>
<td>0.95 ± 0.12</td>
<td>0.95 ± 0.15</td>
<td>0.95± 0.13</td>
</tr>
<tr>
<td>Uric acid (mg %)</td>
<td>5.45 ± 1.12</td>
<td>5.59 ± 1.08</td>
<td>5.37 ± 1.56</td>
<td>8.91±14.35*$</td>
</tr>
<tr>
<td>Cholesterol (mg %)</td>
<td>171 ± 37</td>
<td>181 ±34</td>
<td>197 ± 44**</td>
<td>208± 45</td>
</tr>
<tr>
<td>Total bilirubin (mg %)</td>
<td>0.68 ± 0.36</td>
<td>0.79 ± 0.33</td>
<td>0.83 ± 0.4</td>
<td>0.98± 0.61*</td>
</tr>
<tr>
<td>Direct bilirubin (mg %)</td>
<td>0.22 ± 0.09</td>
<td>0.25 ± 0.07</td>
<td>0.25 ± 0.10</td>
<td>0.29± 0.13</td>
</tr>
<tr>
<td>Indirect bilirubin (mg%)</td>
<td>0.45 ± 0.27</td>
<td>0.54 ± 0.26</td>
<td>0.57 ± 0.30</td>
<td>0.69 0.48*</td>
</tr>
<tr>
<td>Total protein (g %)</td>
<td>7.63 ± 0.36</td>
<td>7.5 ± 0.41</td>
<td>7.5 ± 0.44</td>
<td>7.66± 0.45</td>
</tr>
<tr>
<td>Albumin (g %)</td>
<td>4.69 ± 0.23</td>
<td>4.61 ± 0.21</td>
<td>4.46 ± 0.26*#</td>
<td>4.5± 0.24*</td>
</tr>
<tr>
<td>Globulin (g %)</td>
<td>2.93 ± 0.33</td>
<td>2.89 ± 0.43</td>
<td>3.04 ± 0.45</td>
<td>3.1± 0.47</td>
</tr>
<tr>
<td>AG Ratio</td>
<td>1.62 ± 0.2</td>
<td>1.62 ± 0.24</td>
<td>1.5 ± 0.3</td>
<td>1.46± 0.27*</td>
</tr>
<tr>
<td>AST (IU/L)</td>
<td>24.09 ± 7.59</td>
<td>27.23 ± 16.36</td>
<td>29.95 ± 17.06</td>
<td>31.16 ± 19.03</td>
</tr>
<tr>
<td>ALT (IU/L)</td>
<td>29.42 ± 19.08</td>
<td>34.95 ± 37.95</td>
<td>41 ± 26.76</td>
<td>41.95 ± 19.03</td>
</tr>
<tr>
<td>ALP (IU/L)</td>
<td>76.8 ± 17.89</td>
<td>70.92 ± 23.58</td>
<td>73.86 ± 20.56</td>
<td>± 25.03</td>
</tr>
</tbody>
</table>

**Group I versus Group III , Group IV  p<0.001
*Group I versus Group IV p<0.05
# Group II versus Group III
$ Group III versus Group IV p<0.03

Discussion

Traffic police face multiple occupational hazards, which not only impact mental health but also increases physical health risks. Results of the present study showed that 37% of police personnel were pre-diabetic and 10% were diabetic, the prevalence of which was much higher than the normal population. This was in accordance with the earlier studies done on police personnel of Saudi community. A cohort study demonstrated that occupational stress was an independent predictor of diabetes mellitus. Further, FBG was significantly
high in police personnel with long term exposure to air pollutants. A positive correlation between serum cortisol and blood glucose was seen in police\textsuperscript{9}. Insulin resistance, increased consumption of high carbohydrate, low fiber diet, obesity and lack of physical exercise might have led to increase FBG in police personnel \textsuperscript{10}. Most recent Chinese study showed that exposure to sulfur dioxide, nitric oxide, ozone the major air pollutants increased the prevalence of diabetes mellitus and also was associated with high fasting glucose level\textsuperscript{11}. Though creatinine, the renal function marker did not alter significantly in police personnel compared to normal population, other markers like urea and uric acid elevated significantly with the increase in the number of years of exposure to pollutants. Recent articles not only consider uric acid as a potential risk factor of diabetes mellitus, hypertension and CVD but also a marker of pre-diabetes \textsuperscript{12,13}. Police in Group IV and Group V with high FBG also showed hyperuricemia which highlights the fact that renal clearance of uric acid is reduced with insulin resistance. Physical activity and exercise the protectors of cardiovascular diseases are considerably lower in police personnel \textsuperscript{14}. One of the earlier reports on morbidity profile of police personnel showed prevalence of hypertension, dyslipidemia and cardiovascular diseases \textsuperscript{15}, which is justified by hypercholesterolemia observed in approximately 30\% of the study group, with a steady increase from group I to IV. Several studies observed hypercholesterolemia in people who worked in night shifts. Regular consumption of saturated fat rich diet from restaurants would have led to hypercholesterolemia \textsuperscript{16}. Occupational stress was demonstrated to be a risk factor for non-alcoholic fatty liver disease (NAFLD) among Chinese policemen \textsuperscript{17}. Elevated total bilirubin, both direct and indirect bilirubin in police corroborate with the findings of other workers. Moreover, increased use of automobiles and exposure to diesel exhausts may mediate pathogenesis of NAFLD, inflammation and oxidative stress in police. Urinary 8OHdG, most sensitive marker of DNA damage was markedly elevated in traffic police exposed to vehicular exhausts, with concomitant increase in mutated cytochrome P450 and glutathione S transferase, enzymes known to play a significant role in detoxification of xenobiotics \textsuperscript{18}. The other proposed mechanisms by which occupational stress affect liver function include cytokine related inflammation and activation of hypothalamic pituitary adrenal axis \textsuperscript{19}. Present study observed a steady rise in serum transaminases ALT and AST in police with the number of years of exposure to pollutants. A steady decline in serum albumin may signify a decrease in synthetic function of the liver, in addition to its possible degradation by oxidants. The increase in globulins may be secondary to subclinical inflammatory response to pollutants.

On the whole, the current study emphasizes the need to arrange regular health checkups and create awareness regarding benefits of life style modifications and early diagnosis of organ dysfunction by investigations of biomarkers in police personnel. Further, to minimize the adverse effects of vehicular exhaust, preventive strategies should to be adopted by traffic police.

Conflicts of Interest: None

Source of Funding: Self

Ethical Clearance: The study was approved by Institutional Ethical Committee.

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Bio-Social Characteristics as Determinants of Maternal Death: A Community based Case-Control Study

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Abstract

Background: The WHO estimates that of the 529 000 maternal deaths occurring every year 136 000 take place in India.

Method: This was a community based case-control study done in rural areas of Lucknow, UP (India) in a period of one year. 90 maternal deaths were identified and were matched with two controls. Data were analysed using SPSS version 17.0 and Open Epi version 2.3. Results have been given in form of Unadjusted Odds ratio (UOR) and Adjusted Odds ratio (AOR).

Results: The most important direct cause of maternal death was Hemorrhage. Anaemia was the most important indirect cause of death. Poverty, illiteracy, age of the mother, occupation of the husband were found as significant risk factors for maternal death.

Conclusion: The most vulnerable group for maternal death are the women who are illiterate, belongs to the weaker section of the society and coming with increasing at the time of pregnancy. Women coming with this background needs special focus and ensuring that these women receive appropriate health care right from the conception till the termination of her pregnancy is the need of the hour in order to prevent maternal deaths.

Keywords: case-control study, risk factors, bio-social, maternal death

Introduction

Though India has made an appreciable progress in improving the overall health status of its population but it is is far from satisfaction. The pace of decline in trends of maternal mortality and child mortality has been slow but steady.¹ The National Family health survey (NFHS)-1 (1992-93) was the first to provide the national level estimates of maternal mortality ratio (MMR) for India as 437 per 100,00 live births.² In the year 2013-2014 MMR of India was 167 per 100,00 live births. MMR of Uttar Pradesh, the most populated stated of India, was second highest as 285 per 100,00 live births.³

Several reasons are cited for high maternal mortality in India including poverty, illiteracy. This highlights the need to view maternal mortality as a human rights issue.⁴ Different causes of maternal deaths may develop due to certain social factors working in the background. The aim of our study was to assess the bio-social factors which lead to a mother towards maternal death.

Method

This was a community-based case-control study conducted on 90 maternal deaths identified during the one year study. Study participants were the females...
(age group of 15-49 years) in the study area who either delivered and were alive after 42 days of the postpartum period or died within 42 days of termination of pregnancy in the reference period. All maternal deaths identified in all the rural blocks during the study period were enrolled through snow-balling technique.

Each of the maternal death was matched with two controls. One was a geographical-matched control and other was complication matched control. All controls were drawn from the same community from where the maternal death cases were taken. Maternal deaths were identified through ASHA and ANM. A home visit was made to the family of deceased after the mourning period. Best suitable respondents were interviewed after taking informed consent. For controls mothers, self-reported symptoms were taken and family was inquired for logistics and health seeking.

**Maternal death** (ICD-10\(^5\) definition) is defined as death of a woman during pregnancy or within 42 days from the end of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not accidental or incidental causes.\(^5\)

**Geographical matched control** was defined as mother who lived in same village where a maternal death took place and had delivered normally in the same reference period without any obstetric complications (which needed urgent hospitalization) during ante-/intra-/post-natal period and was alive after 42 days of post-partum period. Random selection was done from the list of deliveries that took place in same geographical area and in same reference period using ASHAs delivery register.

**Complication matched control** was defined as a mother who had a similar biomedical complication (either direct obstetric causes or indirect medical causes of morbidity which needed hospitalization) and was admitted for the complication at a tertiary health centre of Lucknow such as district hospitals or medical college for management but survived and was alive after 42 days of post-partum period.

Non co-operative families, mothers who died due to accidental/incidental causes and late maternal deaths (ICD-10\(^5\) definition: deaths due to direct or indirect obstetric causes after 42 days of termination of pregnancy but less than one year of termination of pregnancy), maternal deaths due to rare non-pregnancy related causes (like leukaemia, burns) and mother residing in urban areas of Lucknow were not enrolled.

The study area was Lucknow district, capital of Uttar Pradesh. As per Census 2011, Lucknow catered a population of 4,588,455 with an average literacy rate of 79.33 Sex Ratio of 940 per 1000 males far below the national average.\(^6\)

Data collection was done through two schedules. Verbal autopsy was conducted using UNICEF’s maternal and perinatal death inquiry and response tool to ascertain the cause of maternal death. A pre-tested and semi-structured schedule was used for both cases and controls to identify their biosocial characteristics. ICD-10 definitions were used for complications during pregnancy and delivery.\(^5\) The completed interview schedules were reviewed by experts to verify the cause of death. Relevant modifications were made in after pretesting.

Data was tabulated on Microsoft Excel Sheet and analyzed by using the software SPSS, Version 17.0 and Open Epi, Version 2.3. All variables were entered as categorical. The significance test used was MacNemar test for paired data. Bivariate analysis and multin was carried out to compare the characteristics (independent /predictor variables) of the cases and controls with a dichotomous outcome which was maternal death or maternal survival and unadjusted odds ratio (OR) and 95 % confidence intervals were calculated for risk factors of maternal death. Risk factors obtained significant in bivariate analysis were subjected to conditional multiple logistic regressions for adjustment of confounding variables and the results have been given in form of unadjusted OR (UOR) and Adjusted OR (AOR).

**Ethical Consideration:** The study received clearance from the Ethical Board Committee of the King George’s Medical University, Lucknow, UP, India. The objective, purpose of the study were explained to all the participants in their local language and written informed consent taken.

**Results**

A total of 90 maternal deaths were identified during the study period. These were matched with 90 geographical controls and 87 complication controls. Three cases of maternal death were from Hepatitis and
Tuberculosis and Tetanus for which matched control could not be identified from the given community. Seventy-three deaths (82.2%) occurred due to the direct cause of maternal death. The most common direct cause of maternal death was Hemorrhage (37, 41.1%), followed by Peurperal Sepsis (16, 17.8%), Ruptured Uterus/Obstructed Labour (9, 10%), Pre-Eclampsia/Eclampsia (8, 8.9%). Three cases of deaths due to abortion and one death due to maternal tetanus was reported. Sixteen deaths occurred due to indirect causes of maternal death. Amongst indirect causes, Anemia (14, 15.6%) was the most important cause of death. Fourth-fifth of the death due to indirect causes was due to Anemia.

The distribution of bio-social risk factors amongst maternal deaths and the geographical matched controls, who were apparently healthy till 42 days of post-partum period, were compared after adjustment for confounding factors with multinomial regression. It was seen that increasing age, scheduled caste community, husband being a farmer or a labour, illiteracy of the mother were the most important predictors for maternal death. Maternal age 30 years and above increased the odds of death by four-fold (OR 3.7; 95% CI 1.1-12.7). Coming from scheduled caste community increased the odds of death by three-fold (OR 2.9; 95% CI 1.3-6.8). Husband being a farmer or a labour raised the odds of death by six-fold (OR 5.79; 95% CI 1.8-19.1). Illiteracy status of the mother increased the odds of death by four-fold (OR 4.3; 95% CI 1.5-12.1). Illiteracy status of husband was found statistically significant on univariate analysis but significance was lost after adjustment. (Table-1)

The distribution of bio-social risk factors amongst maternal deaths and the complication matched controls, who developed same complication but survived from it, were compared after adjustment for confounding factors with multinomial regression. It was seen that husband being a farmer or a labour, illiteracy of the mother, belonging to the poorest class of socio-economic status (Class V) and family not able to generate income whole year were the most important predictors for maternal death. Husband being a farmer or a labour raised the odds of death by nine-fold (OR 8.9; 95% CI 2.9-27.1). Illiteracy status of the mother increased the odds of death by two and half times (OR 2.5; 95% CI 1.1-5.7). Poor socio-economic status also increased the odds of death by six-fold (OR 6.0; 95% CI 2.2-16.2) and family not able to generate income for whole year raised the odds of death by three-fold (OR 3.4; 95% CI 1.2-10.4) (Table-2)

**Table 1. Comparison of maternal deaths with their geographical controls by the bio-social characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sub-category</th>
<th>Case No. (%) N=90</th>
<th>Control No. (%) N=90</th>
<th>Unadjusted OR (95% CI)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age during index pregnancy (years)</td>
<td>≥ 30</td>
<td>22(24.4)</td>
<td>5(5.6)</td>
<td>1.5(1.1-1.9)*</td>
<td>3.7(1.1-12.7)*</td>
</tr>
<tr>
<td></td>
<td>&lt; 30</td>
<td>68(75.6)</td>
<td>85(94.4)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Caste of the family</td>
<td>SC</td>
<td>74(82.2)</td>
<td>52(57.8)</td>
<td>1.65(1.2-2.2)*</td>
<td>2.92(1.3-6.8)*</td>
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<tr>
<td></td>
<td>Others</td>
<td>16(17.8)</td>
<td>38(42.2)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Occupational status of husband</td>
<td>Farmers/ Labours</td>
<td>70(78.7)</td>
<td>43(47.8)</td>
<td>1.8(1.4-2.6)*</td>
<td>5.79(1.8-19.1)*</td>
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<tr>
<td></td>
<td>Others</td>
<td>20(21.3)</td>
<td>47(52.2)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Literacy status of mothers</td>
<td>Illiterate</td>
<td>59(65.6)</td>
<td>26(28.9)</td>
<td>2.2(1.6-2.95)*</td>
<td>4.29(1.5-12.1)*</td>
</tr>
<tr>
<td></td>
<td>Literate</td>
<td>31(34.4)</td>
<td>64(71.1)</td>
<td>Reference</td>
<td>Reference</td>
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<tr>
<td>Literacy status of husband</td>
<td>Illiterate</td>
<td>49(54.4)</td>
<td>20(22.2)</td>
<td>1.95(1.4-2.7)*</td>
<td>1.2(1.04-3.4)</td>
</tr>
<tr>
<td></td>
<td>Literate</td>
<td>41(45.6)</td>
<td>70(77.8)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
</tbody>
</table>

*p value was found to be significant*
Table 2. Comparison of maternal deaths with their complication matched controls by the bio-social characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sub-category</th>
<th>Case No. (%) N=87</th>
<th>Control No. (%) N=87</th>
<th>Unadjusted OR (95% CI)</th>
<th>Adjusted OR (95 % CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational status of husband</td>
<td>Farmers/ Labours</td>
<td>69(79.3)</td>
<td>33(37.9)</td>
<td>2.4(1.7-3.3)</td>
<td>8.9(2.9-27.1)*</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>18(20.7)</td>
<td>54(62.1)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Literacy status of mothers</td>
<td>Illiterate</td>
<td>58(66.7)</td>
<td>34(39.1)</td>
<td>1.7(1.3-2.4)</td>
<td>2.5(1.1-5.7)*</td>
</tr>
<tr>
<td></td>
<td>Literate</td>
<td>29(33.3)</td>
<td>53(60.9)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Socio-economic class</td>
<td>Class V</td>
<td>37(42.5)</td>
<td>9(10.3)</td>
<td>1.95(1.4-2.7)</td>
<td>6.0(2.2-16.2)*</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>50(57.5)</td>
<td>78(89.7)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Earning whole year</td>
<td>No</td>
<td>45(51.7)</td>
<td>32(36.8)</td>
<td>1.3(1.06-1.9)</td>
<td>3.4(1.2-10.4)*</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>42(48.3)</td>
<td>55(63.2)</td>
<td>Reference</td>
<td>Reference</td>
</tr>
</tbody>
</table>

*p value was found to be significant

Discussion

In the present study the majority of maternal deaths were due to direct causes amongst which obstetric hemorrhage was the most important cause of death. Amongst the indirect causes Anemia was the most important cause of death. This finding is in concordance with the figures from India and worldwide.\(^7,8\)

In the present study increasing age of the mother was found as an important risk factor for maternal death specially compared to geographical control but not against complication matched control. This finding suggests that increasing age is a risk factor for development of obstetric complications which if left unattended may lead to maternal death. Or finding is in line with other case-control studies conducted in India.\(^9,10\) A Birth cohort study from US (1995-2000) which included 8079996 live births reported that the risks for most obstetric complications such as Prolonged labour, dysfunctional labour, excessive labour bleeding, mal-presentation increased with increasing maternal age.\(^11\)

We observed that illiteracy status of both the husband and wife had a risk for maternal death. Illiteracy status of the women increased the risk of death when compared to apparently healthy geographical control while the illiteracy status of the husband increased the risk of death when compared to complication matched control. This finding suggests that mother’s literacy status may have a role in preventing the development of complication but once the complication has developed the decision making to seek for health care depends on the literacy status of the husband. Several studies have cited that in Indian setup it’s the male members of the house who takes decision for seeking health care especially when it is related to logistics like time, transport and money.\(^10,12,13\)

Proxy indicators for poverty such as socio-economic class, income generation for only part of year, belonging to scheduled class rural community and husband working as a farmer or labour were found to be significant risk factors when compared to both geographical and complication matched control. This finding suggests that poverty has a role to play in both development of maternal complications and occurrence of maternal death. Or finding is in line with studies conducted in different parts of India.\(^9,10,14\)
Limitations of the study:

1. Small sample size: Since maternal death being a rare event the sample size was small and hence weaker risk factors may not have been detected.

2. Recall bias: The result may be influenced by the recall bias as the reference period was large and families who faced the event long back couldn’t give as good an information as those who faced the event recently especially regarding logistics and delays. To minimize this bias we interviewed the family as early as possible.

3. Information bias: In our study respondents amongst cases were the family members whereas the controls responded personally. Hence some variables/events may have gone unnoticed by the family members. To minimize this bias we tried to collect information from the best suitable respondent who was there at the time of specific pregnancy-related events.

Conclusion

We conclude that poverty, illiteracy, weaker section of society, increasing age of the mothers were important bio-social risk factors contributing to maternal death through a web of causation. Thereby women coming with this background needs special focus and ensuring that these women receive appropriate health care right from the conception till the termination of her pregnancy is the need of the hour in order to prevent maternal deaths.

Conflict of Interest: We declare that we have no conflict of interest.

Source of Support: None

References


Comparision of Contamination of Tooth Brush among Dental Students and Patients

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Abstract

Introduction: The insertion of fixed appliances alters the oral microbiological profile, thus increasing the risk for caries and gingivitis considerably. Furthermore, caries and gingivitis prevention demands greater efforts in tooth brushing, since brushing becomes more complicated as substantial parts of the tooth surface are covered with attachments. Tooth brushing is most common method of maintaining oral hygiene. Contaminated tooth brushes can be a source of infection. The main aim of the study is to compare the contamination of tooth brush among dental students and patients undergoing orthodontic treatment.

Material and Method: Welcare orthodontic tooth brushes were used for the study. Twenty random subjects were selected for the study which included two groups of 10 subjects containing 10 dental students and 10 patients undergoing orthodontic treatment. Same tooth brush and tooth paste was given all the samples. The subjects were given instructions for brushing and asked to return the samples after one week. The samples are tested for bacterial colony forming units in nutrient agar culture plate.

Results: It has been found from the result that there is no statistical difference between the number of colony forming units in the nutrient agar culture plate between the tooth brush obtained from the dental students and the patients undergoing orthodontic treatment.

Conclusion: though there were no statistical difference between the two groups, there were colony forming bacteria in both the cases. Thus it is very essential to rinse the brush properly and store the same in a dry container to prevent contamination from external environment.

Keywords: Toothbrush, Contamination, Orthodontics, Malocclusion, Oral hygiene

Introduction

Tooth brush is most common oral hygiene aid to promote oral health and prevent dental diseases. Tooth brushes can get contaminated with microorganisms present in oral cavity. Retention and survival of microorganisms on tooth brush after brushing represents a possible cause of re-contamination of the mouth. Tooth brushes are usually rinsed in plain water and are stored in Bathroom which harbours millions of microorganisms. These micro-organisms usually grow in moist conditions.

Due to increase in demand for the presence of a well aesthetic dentition, the prevalence of population undergoing Orthodontic treatment has significantly increased in the past few years. The esthetics of patient plays an important role in development of social and psychological state of the patient [1]. People who are dissatisfied with their appearance are the ones who seek for orthodontic treatment [2]. Tooth brush contamination
occurs not only from the oral environment but also from the outside environment and surroundings where the tooth brushes are usually stored. The purpose of this study is to evaluate and to study if there is any difference in the number of bacterial colonies formed by contamination of tooth brush from the oral and external environment between the tooth brushes obtained from the dental students and the tooth brushes from the patients undergoing orthodontic treatment.

**Materials and Methodology**

Twenty random people were selected using convenience sampling method for the study and were divided into two groups. Convenient sampling method was used for selecting the samples. One group included ten patients who were undergoing orthodontic treatment in the department of orthodontics in Saveetha dental college, Chennai and other group included ten postgraduate dental students without fixed orthodontic appliance studying in the same university. Informed consent was obtained from all the subjects participating in the study.

**Inclusion criteria**

Patients undergoing fixed orthodontic treatment in one group and post graduate students not undergoing orthodontic treatment in another group.

Subjects between age of 18-30 years.

Subjects who had no active periodontal problems or carious lesions.

Subjects with no systemic disease or health conditions.

**Exclusion criteria**

Subjects with active carious lesions and current or previous history of periodontal problems.

Subjects with any systemic health problems or conditions.

Subjects taking any anti-infective agents or any form of medications.

Welcare orthodontic tooth brushes (fig 1) were used for this study to find the contamination of tooth brushes in this study and Colgate anticavity active salt tooth paste was also given to the patients for this study. All the subjects were given the same tooth brush and tooth paste to prevent any bias during the study. They were given instructions about the method of tooth brushing.

![Welcare orthodontic tooth brush](image)

The tooth brush samples were collected from all the subjects after one week and were taken for microbiological study. The subjects were instructed to return the tooth brushes after one week in a wrapped aluminium foil to prevent any contamination during the transportation. Then the samples were examined for colony forming units in the department of Microbiology in Saveetha dental college and hospital, Chennai. The examiner was blinded from the group of tooth brush which the sample belonged to prevent any bias. One single tuft of each of the tooth brushes obtained from the subjects were removed using a sterilized metal tweezer and is added to test tube containing 1 ml of saline to form a bacterial suspension. The bacteria are then uncoated by gently tapping the test tube. 10 micro litre of the suspension is pipetted out using sterilized micro litre tips on to a culture plate containing solid nutrient agar culture medium. The bacterial suspension is inoculated into the culture plate containing the culture medium by streaking the pipetted out liquid using sterile cotton swab. Then the plates are incubated and were examined for the bacterial colony forming units after the incubation period of minimum twelve hours.

After the incubation period the culture media plates are examined for the number of bacterial colonies.

**Results**

The number of microbiological colonies formed from the toothbrush samples obtained from the subjects are tabulated below.
### Group 1 [Patients undergoing orthodontic treatment] | Bacterial colony count | Group 2 [Students not undergoing orthodontic treatment] | Bacterial colony count
---|---|---|---
Nagarajan | 94 | Sunayna | 64
Santhosh | 79 | Subashree | 173
Gladyston | 232 | Sukanya | 0
Faridha | 89 | Sruthi | 74
Shyam | Confluent growth | Aravind | 94
Devaki | 156 | Joji | 42
Karthik | 142 | Swetha | Confluent growth
Prasanth | Confluent growth | Vaishnavi | 49
Muthulakshmi | 93 | Vignesh | 109
Azhagar | 206 | Joseph | 148

The number of bacterial colonies obtained from the twenty samples is tabulated. The bacteria identified from the smears prepared from the colonies showed increased prevalence of *Streptococcus* mutans, *Lactobacillus* and *Staphylococcus* in the samples obtained from Group 2 [Dental students undergoing orthodontic treatment] and prevalence of *Streptococcus* mutans, *Lactobacillus* species, *Staphylococcus* and *Enterococcus* bacterium in the samples obtained from Group 1 [Patients undergoing orthodontic treatment].

### Discussion

Patients undergoing orthodontic treatment are more prone for alteration in their microbiological profile. The results obtained in the study showed no significant difference in the number of bacterial colonies formed in the culture medium (fig 2 & fig 3). The samples obtained from the patients undergoing orthodontic treatment showed mild difference in the number of bacterial colonies but the difference was not statistically significant [p>0.05]. Further study with increased sample size is essential to prove the statistical significance in the difference in number of bacterial colonies.

The type of bacteria obtained from the colonies was studied by preparing a smear of the colonies in the culture medium. It showed that there was presence of *Streptococcus*, *staphylococcus* and *lactobacillus* bacteria from the colonies obtained from all the tooth brushes. This showed the contamination of the toothbrush with microorganisms. Few samples from group 1 [n=2] showed the presence of *enterococcus* bacterium in their smear.

Malocclusion is one of the most common dental disorders that the dentists come across in their daily practice. The prevalence of malocclusion has been studied
by many authors. Sarabjeet Singh et al [3] studied the prevalence of malocclusion and the need for orthodontic treatment in children of Himachal Pradesh and stated that greater need for orthodontic treatment was seen in 37.55% of the sample taken into the study. Aniket H. Vibhute [4] and Ramachandhra Prabhakar et al [5] studied the prevalence of malocclusion in subjects of Maharashtra and Chennai respectively. They stated that Angle’s class 1 malocclusion was the most common malocclusion seen among the population with class 1 molar relation with spacing and crowding. The prevalence of malocclusion in the school going children of Bangalore was studied by Usha Mohan Das et al [6]. They stated that 71% of the studied subjects had malocclusion and out of it 61% subjects had class 1 malocclusion and mostly with crowded lower anterior teeth. Goyal Sandeep et al [7] did a retrospective hospital based study on the prevalence of malocclusion in a hospital in Rwanda and stated that Angle’s class 1 malocclusion was the most prevalent malocclusion among the subjects included in the study.

Microbial alterations in the oral cavity after fixed orthodontic treatment was studied by many researchers in the past two decades [8-10]. These studies showed that there was definite increase in the number of micro-organisms such as Lactobacillus species and Streptococcus mutans in saliva and stated that it was mainly due to the accumulation of plaque on the tooth surface and poor oral hygiene maintenance. They also stated that there are alterations in oral salivary flow and pH. The rate of stimulated salivary flow was increased in the patients undergoing orthodontic treatment. A systematic review on the effect of fixed orthodontic appliance was done by Amanda Osório Ayres de Freitas et al [11]. They stated that the literature revealed only moderate evidence to show the presence of fixed orthodontic appliances influences the amount of oral microorganisms. The effect of fixed orthodontic appliance on oral health status was studied by Kenan Cantekin et al [12]. The results of their study showed that DMFT counts and the Periodontal Index were increased in a group of young dental patients undergoing fixed orthodontic treatment, and thus the patients undergoing orthodontic treatment must follow a very rigid oral hygiene protocol.

The contamination of tooth brush was studied by various authors in the past few decades. It was as early as 1989 when Muller HP et al [13] studied the contamination of tooth brush by A. actinomycetemcomitans from the patients harbouring them. They stated that 62% of the toothbrushes of the subjects showed significant amount of the bacteria when the organisms were found in the mucous membranes of the saliva. A pilot study on the microbial contamination of tooth brush was done by S.S. Taji et al [14]. They stated that the total number of bacterial colonies per toothbrush was found to be $10^4$ to $10^5$ colony forming units. However there was no incidence of the presence of Streptococcus mutans or lactobacillus in their samples. A review of literature on the contamination of tooth brush was done by Michelle R. Frazelle et al [15]. They found that toothbrushes of subjects who are healthy and toothbrushes of subjects with any oral diseases became contaminated with the pathogenic bacteria from the dental plaque, environment, design, or due to combination of these factors. Rashmi Naik et al [16] in their study stated that the contamination of tooth brush is a potential threat to oral and general health and said that it was very essential to disinfect tooth brush once in a while.

The microbial contamination of the tooth brushes and their decontamination was studied by various authors [17-19]. They showed that there was severe contamination of tooth brushes with streptococcus mutans immediately after brushing.

Jay Chamele et al [20] did an in-vitro study to compare the efficacy of microwaves and chlorhexidine in decontamination toothbrushes and pacifiers. They showed spraying the tooth brush with 0.12% of chlorhexidine and irradiation of the toothbrush with microwave for seven minutes had equal effect on disinfection of toothbrushes and pacifiers. A comparison between the efficacy of ultra-violet rays and microwaves in disinfection of toothbrushes was studied by S. K. Gujari et al [21]. They showed that after disinfection with microwave of ultra-violet rays there was significant reduction in the number of colony forming units thus showing their efficacy in decontamination of tooth brushes. The contamination of tooth brushes with antibacterial properties by microorganisms was studied by M. Efstratiou et al [22]. They stated that the toothbrushes with antibacterial properties in which the bristles were coated with triclosan had no effect against the number of colony forming units and on the other hand tooth pastes significantly reduced the contamination of the toothbrushes with microorganisms.
Conclusion

Patients undergoing orthodontic treatment for aesthetic and functional needs have been increased in the past few decades. The maintenance of oral hygiene in such patients becomes difficult due to the presence of various attachments on tooth surface. This may result in various infections of the gingival and the periodontal structures. Thus it is very essential to prevent contamination from external sources. The contamination of tooth brushes was seen in both groups and there was no statistical difference in the number of colony forming units between both groups. There was presence of enterococcus bacterium in few samples of group 1 along with the streptococcus, staphylococcus and lactobacillus species and the reason for which cannot be justified. Thus it is very essential to follow strict oral hygiene protocols in all conditions. Frequent change of tooth brush and effect of disinfection should be considered in the future studies.

Ethical Clearance- Taken from the college Scientific Research Board

Source of Funding- Self Funding

Conflict of Interest - Nil

References

14. S. S. Taji, A. H. Rogers, The microbial contamination of toothbrushes. A pilot study, Australian Dental


Awareness of Ill – Effects to Tobacco in General Population

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¹Professor, ²Post Graduate Student, Department of Oral Medicine and Radiology, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai, India

Abstract

Introduction: Tobacco – related illnesses are on the rise due to increase in the number of people using tobacco products in smoking and smokeless forms. Tobacco acts as an etiological factor for various diseases affecting oral and general health. The aim of this study is to assess the level of awareness of the ill – effects of tobacco use in general population.

Materials and Method: The assessment of knowledge and awareness of the effects of tobacco use – smoking and smokeless is done by evaluating the answers to 20 - point questionnaire. The questionnaire was designed to enquire the extent of awareness of the respondents regarding the risks and hazards to tobacco use on oral and general health. The participants of the study were asked to fill the questionnaire either electronically or in the form of hand – outs. The results of the study were compiled and expressed in frequencies and percentages.

Results: 83% of the study population were aware of the ill – effects of tobacco use. Majority of the participants were aware that smoking causes lung cancer. 88% of the study population were aware of the risks of passive smoking. About 16 % were unaware of the complications of passive smoking. 78% of respondents were aware that tobacco chewing can cause oral cancer.

Conclusion: Increased awareness of ill – effects of tobacco can lead to decrease in the number of people using tobacco and related products. Raising mass awareness movements against tobacco, tobacco control and cessation measures can be undertaken to develop tobacco – free future generations.

Keywords: Tobacco, Smoking, Oral cancer, Awareness, Passive smoking

Introduction

Tobacco is a leafy plant belonging to the family Nicotiana. It contains an alkaloid called nicotine which is a highly addictive drug. It is grown and consumed all over the world. The tobacco leaves are cured (dried), processed and used in various forms. Tobacco products are used mainly in smoking and smokeless forms.

Smoking forms of tobacco include cigarettes, beedi, hookah, cigars, pipes and smokeless forms are betel quid chewing, mishri, khaini, gutka, snuff, and as an ingredient of pan masala¹.

India is the third largest producer of tobacco and second largest consumer of tobacco products. A variety of tobacco products available at low costs also acts an incentive for substantial number of users in India. The use of both smoking and smokeless forms are prevalent². According to WHO global report on trends in prevalence of tobacco smoking 2015³, about 13% of the Indian population were smokers. WHO also estimated that by 2025, 8% of the population will be smokers, if the efforts to control tobacco persists in the same pace.

Tobacco smoke contains about 5000 chemicals of which about 98 are proven to be carcinogenic⁴. The
health hazards of tobacco smoking include increased risk of oral cancer, lung cancer, heart diseases. Smokeless tobacco is the chief etiological factor for oral cancer, gastro-esophageal cancer, periodontal diseases and pre-malignant lesions in the oral cavity. The health hazards of tobacco smoke do not cease with the smokers, but also affects the non-smokers near them. It is known that passive smoking is as dangerous as active smoking as there is “no risk – free level of exposure”. The airborne nicotine from second – hand smoke is known to be absorbed in similar concentrations as in active smoking and have displayed high levels of nicotine biomarkers in non-smokers. Second – hand smoke is linked to frequent and severe asthma attacks, ear infections, sudden infant death syndrome in babies, learning difficulties and neurobehavioural effects in children. The knowledge and the understanding of the risks of passive smoking can help prevent initiation of the habit in non – smokers and to establish regulations to prevent exposure of general population to second - hand smoke.

The awareness about these hazards can help reduce the number of tobacco – related deaths, facilitates the users to quit the habit and also impede non – users from becoming users. This study aims at evaluating the awareness of general population regarding the ill-effects of tobacco in the form of a questionnaire survey.

**Materials and Method**

A questionnaire containing 20 questions to assess the extent of awareness of the ill – effects of tobacco was designed. The details of the subject – name, age, current and past tobacco status, and habit history, perception about the health hazards of use of smoking and smokeless forms, passive smoking, and readiness to quit the habit were assessed using the questionnaire. The study sample was identified as general population and not specified by age groups.

The hazards of tobacco use in smoking form such as heart diseases, lung cancer, oral cancer, pulmonary tuberculosis, low – birth weight in infants born to pregnant women who smoke and impotence in men were listed. The ill – effects of tobacco chewing like oral cancer, stomach cancer, gum recession and gum disease, tooth loss, whitish patches that turn malignant and unaware of the effects were tabulated. The risks of passive smoking such as Lung infections, Ear infections, frequent and severe asthma attacks, lung cancer, impaired lung function and slow lung growth in children, learning difficulties, developmental delays and neurobehavioural effects in children, miscarriages in women exposed to passive smoke, sudden infant death syndrome in babies and unaware of the risks were enumerated. The respondents were required to select the options which they were aware of as an adverse effect of smoking, tobacco chewing and passive smoking.

Respondents answered the questionnaire either electronically or in handouts provided to them. 100 responses were collected and evaluated. The results obtained were analyzed and tabulated using frequencies and percentages.

**Results**

The majority of the respondents belonged to the age group 16-30 years (38%), followed by 30% of respondents from the age group 31-45 years. Only 3% of the respondents were from age less than 15 years (Figure 1). Majority of the participants who are users responded to the age at which they started using tobacco as 16-30 years (67%).

Of the 100 respondents, 72% of them were non-users and 28% were users of tobacco and related products. Of the 28% of users, 86% of them were smokers and 14% used chewable or snuff type of tobacco. Out of 72% of current non-users, 6 respondents were past users – 4 of them used tobacco in smoking form and 2 of them used in smokeless form.

In response to who introduced them to the habit, 45% of them answered as Friends, 29% as relative and 26% as self. Of the 26% of respondents, 50% of them started using tobacco by seeing others use it (Figure 2).
72% of the participants responded in denial to the use of tobacco in the household. Of the 100 respondents, 34% of them were exposed to tobacco products at work.

**Awareness of ill – effects of tobacco use:**

83% of the study population were aware of the ill – effects of tobacco use.

**Ill – effects of tobacco smoking:**

76% of the study population were aware that smoking causes lung cancer and 66% were knowledgeable about oral cancer as a consequence of smoking (Table 1). Respondents were comparatively unaware of the increase in the risk of pulmonary tuberculosis and impotence in men as a possible side effect of smoking.

**Awareness of ill – effects of passive smoking:**

With regard to the knowledge of ill –effects of passive smoking, 88% of the study population were aware of the risks of passive smoking. 66% of the respondents answered that they were aware that passive smoking increases the risk of heart attack and stroke in non – smokers.

57% and 49% of the participants were aware that passive smoking can cause lung cancer and frequent and severe asthma attacks respectively (Table 2).

16% of the respondents were unaware of the complications of passive smoking.

**Table 2 : Awareness of ill – effects of passive smoking**

<table>
<thead>
<tr>
<th>Ill – effects of passive smoking</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung infections</td>
<td>55</td>
</tr>
<tr>
<td>Ear infections</td>
<td>16</td>
</tr>
<tr>
<td>Frequent and severe asthma attacks</td>
<td>49</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>57</td>
</tr>
<tr>
<td>Impaired lung function and slow lung growth in children</td>
<td>22</td>
</tr>
<tr>
<td>Learning difficulties, developmental delays and neurobehavioural effects in children</td>
<td>13</td>
</tr>
<tr>
<td>Miscarriages in women exposed to passive smoke</td>
<td>13</td>
</tr>
<tr>
<td>Sudden infant death syndrome in babies</td>
<td>4</td>
</tr>
<tr>
<td>Unaware</td>
<td>16</td>
</tr>
</tbody>
</table>

92% of the participants were aware of the advertising of ill – effects on various tobacco products. Of the 28% of users, 43% exhibited readiness to quit the habit after knowing the ill – effects of tobacco. 51% of the study population expressed willingness to advice someone to...
stop smoking in public.

Discussion

There were a few previous studies that are done to measure the extent of awareness of general population about the ill – effects of tobacco – in smoking, smokeless forms as well as passive smoking. The study population was confined to specific age groups such as adolescents, school children, college – going and medical students in many previous studies. Chitalkar et al reported that 90% medical students were aware of role of smoking in causing oral and lung cancer. Similar results were reported by Raina et al in study done to assess the knowledge, attitude, and behavioral determinants of tobacco use among high school students (age 13–15 years) in Bangalore. However, negative results were reported by Basavaraj et al. The results of their study showed that only 4% of their study population had good awareness about effects of smoking on oral health. As the present study is not age – specific, the level of awareness among various age groups of the population can be assessed.

In the present study, the study population (83%) was well aware of the ill-effects of tobacco. The awareness regarding lung cancer as an outcome of smoking was maximum among the participants followed by oral cancer. It is similar to the results reported by Hansen et al and Ariyawardana et al. Hansen et al reported that 99% and 95% of the study population identified that smoking and passive smoking as a risk factor for lung cancer. Ariyawardana et al reported 95% awareness of oral cancer of which only 44.9% were aware of precancerous lesions.

78% of the respondents were familiar with the fact that tobacco chewing can cause oral cancer. The knowledge about premalignant lesions is low (27%) in the study population. About 9% of the population were unaware of the hazards of tobacco chewing. The awareness of premalignant lesions can be beneficial to the general public as it can lead to early diagnosis and prevention of the lesion from progressing into a malignancy.

The results of the present study was higher with reference to the knowledge of the participants on second hand smoke or passive smoking. About 88% of the study population were aware of the adverse effects of passive smoking. The awareness of lung cancer and lung infections as a result of passive smoking was more prevalent among the respondents followed by increased frequency and severity of asthma attacks. 16% of the participants were unaware of the consequences of passive smoking. Knowledge of passive smoking can help building a smoke – free environment and obstruct the progression of passive smoking induced health hazards in future generations.

Out of 28% users, 57% were in precontemplation stage of change. Such patients need to be counseled to assist them in quitting tobacco use. Raising awareness about Nicotine replacement therapies and other pharmacologic – based strategies that can help reduce the symptoms of withdrawal can improve the chances of quitting in these users.

Conclusion

Even though the present study was not age specific, there was reduced number of responses from adolescents and school children (< 15 years). Hence, the extent of awareness of ill – effects of tobacco could not be studied adequately in this age group and is a limitation of the present study. The study population was limited to 100 and future research with a higher sample size and equal distribution of the participants among various age groups is required to assess the exact level of awareness of the adverse effects of tobacco use in general population.

Another limitation of this study is that there was only 28% of the survey population who were users of tobacco products. Hence the quantification of awareness of tobacco related illnesses in users cannot be done.

Increased awareness of ill – effects of tobacco can lead to decrease in the number of people using tobacco and related products. Raising mass awareness movements against tobacco, tobacco control and cessation measures can be undertaken to develop tobacco – free future generations. Knowledge about tobacco replacement therapies should be disseminated among young smokers to aid them in quitting their habit.

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References


Factors Influencing Dental Avoidance Behavior among Adolescents in India- Application of Contemplation Ladder

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Abstract

Health workers are incessantly in dilemma as to why people healthy or otherwise avoid health professionals. This study aimed at establishing an association between the dental ladder and numerous psychosocial factors associated with dental avoidance in an adolescent population using a Contemplation Ladder. This study is an analytical cross-sectional study which evaluates attitudes of subjects towards their oral health and future intentions to go to a dentist in the coastal city of Mangalore. The Dental Contemplation Ladder is based on the ladder developed by Biener and Abrams. The questionnaires used in the study included the Modified Dental Anxiety Scale (MDAS, the Dental Neglect Scale (DNS) and the Revised Dental Beliefs Survey (R-DBS). The Pearson chi square association between the ladder scores and gender showed high statistical significance (p <0.001) with females having higher ladder scores than males. A one-way ANOVA demonstrated a significant difference between the variables with (p<0.05) for all three psychosocial variables. The regression models showed a statistically significant relation between the ladder scores and psycho social variables. The study provides an important link between dental absenteeism and different psychological and social parameters and the interrelation and association of these to the differing stages of change in adolescent population.

Keywords: dental avoidance, adolescent, dental ladder, health behavior models, psychosocial factors.

Introduction

Health workers are incessantly in dilemma as to why people healthy or otherwise avoid health professionals. This scenario deteriorates in the dental health setup, when patients even after desensitisation do not turn-up on a regular basis at the dentist’s office. When viewed in the aspect of a dental health professional, this cohort forms a major impediment to any program and this jargon severely interferes with the comprehensive treatment plan tailor-made for the individual and in turn causes a greater set back to the treating dentists.

It’s always a matter of controversy as well as a conundrum as to why individuals avoid dental treatment. To pinpoint where the problem lies is very difficult. There are many factors that might contribute towards dental avoidance of which, dental fear is among the most dominating factors followed by dental anxiety. The other contributing factors for avoidance might include dental indifference,2 high costs of dental care3, ‘trust’, and ‘fear of negative information’. However, the EFA further suggested a general factor with all 15 items. By using the CFA, five factors were found based on the EFA solution and the original DBS dimensions. A general factor, ‘social interaction distress in dental treatment’, and four more narrow dimensions, ‘communication’, ‘trust’, ‘fear of negative information’ (originally labelled ‘belittlement’ perceptions of the dental experience as being uncontrollable, unpredictable, dangerous.4and this might be explained by the less frequent dental visiting

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of many fearful people. The objectives of this study were to investigate differences between dentally fearful people who regularly attend the dentist and fearful people who infrequently visit the dentist. A random sample of 1,082 Australians ! 15 yr of age completed a mailed questionnaire (response rate = 71.6%). The solutions for all these problems might be related to the behaviour, attitude and beliefs of individuals and thus, focus on behavioural sciences is the need for the hour. Health behaviour research is now focusing increasingly on many such models and their application in changing health behaviour in the community.

There are many models that assess health behaviour needs of the individual. The foremost models that have been practised for health behavioural change are the Health Belief Model, the Theory of Planned Behaviour, Transtheoretical Model and social cognitive theory. However, in the present study The Transtheoretical Model (TTM) developed by Prochaska, Norcross, and DiClemente was applied, which measured an individual’s readiness to adopt new health behaviour.

The study aimed at establishing an association between the dental ladder and numerous factors associated with dental absenteeism in an adolescent population. Adolescents between the ages of 10 and 19 years are a vulnerable group and are the bridges between the young and the old and are often the population that is routinely missed for screening especially for dental diseases. Many serious diseases in adulthood have their roots in adolescence and catching them younger seems the best preventive modality that can be practiced worldwide.

We hypothesized that the participants who selected higher scores on the Ladder would also provide convincing acceptance for statements inquiring about their intentions to go to a dental health professional (DHP), their attitudes towards DHP, and negative beliefs about DHP all of it in turn reflecting their oral health status.

**Method**

Study type and Study Setting: This study was an analytical cross-sectional study which evaluated the attitudes of subjects towards their oral health and future intentions to go to a dentist in an urban and rural locale in the coastal city of Mangalore in India. The list of all institutions in Mangalore city was obtained from Authorities. Two urban and rural institutions were randomly selected. The participants who were familiar with English and Kannada and were present during the study period were included in the study.

**Material**

The Dental Contemplation Ladder was based on the ladder developed by Biener and Abrams originally meant for smoking cessation, the words at five different rungs of ladder were modified accordingly and referred to the stages of change of the Transtheoretical Model (TTM) developed by Prochaska, Norcross, and DiClemente. The Kannada version of the ladder was designed by translating and back-translating the English wording. The ladder was reassigned the values of the rungs to range from 1 (lowest rung) to 10 (highest rung). Other questionnaires used in the study included the Modified Dental Anxiety Scale (MDAS), the Dental Neglect Scale (DNS) and the Revised Dental Beliefs Survey (R-DBS).

Sample size was calculated using the formula: G power 3, which was calculated from pilot study among 30 adolescents. The final sample size was estimated to be 381 considering 5% allowable error.

Ethical clearance was obtained from the Institutional Ethics Committee. Permissions were obtained from the Head of the institutions of the Colleges, randomly selected by lottery method. Participants gave written informed consent before answering the questionnaire and undergoing an oral examination.

**Statistical analysis**

Data was analyzed using Statistical Package for Social Sciences (SPSS), version 16.0 (SPSS Inc., Chicago IL). Mean (X) and Standard Deviation (SD) was calculated. The Chi square and Fisher’s exact tests was used for comparison of categorical data. Pearson product-moment correlation was used to correlate ladder scores with other variables. Multiple means between the groups of all parameters were compared with ANOVA and a post hoc test. The inter relationships between parameters which were found to correlate significantly were assessed using multiple linear regression analysis and p value < 0.05 was considered statistically significant.
Results

Of the 526 participants present on the days of study 458 of them were subjected to the oral health examination and answered the questionnaire with a response rate of 87 percent. The mean age of the participants was 18.37 (SD= 0.54), the number of males in the sample was slightly higher than the female representatives at 55%. More than half of the representatives were from the rural background (56.3%). Demographic and psychosocial variables and association with ladder scores in rural and urban population Table 1.

Reliability analysis revealed a Cronbach’s alpha value of 0.93. Split-half reliability and Guttman split-half reliability were found to be 0.76 and 0.74, respectively. Test-retest reliability reflects the variation in measurements taken by an instrument on the same subject under the same conditions and was found to be 0.74 (p < 0.01)

The Pearson chi square association between the ladder scores and gender showed high statistical significance (p <0.001) with females having higher ladder scores than males. The rural and urban divide between the participants was contrasting nonetheless as there was a highly significant association (p <0.001) between the rural and urban participants with more than 57(25%) ready to go to the dentist as opposed to 48(24%) of urban population who were unwilling to go to a dentist. Pearson product-moment correlation between the ladder scores and the psychosocial variables demonstrated some meaningful and noteworthy correlations, dental ladder scores were positively correlated with dental belief with (r= +0.046) and was negatively correlated with dental anxiety (r= -0.33) (p<0.001). [Table 2]

A one-way between subjects ANOVA was conducted to compare the effect of ladder scores on dental anxiety, dental neglect and dental belief. There was a significant difference between the variables with (p<0.05) level for the three psychosocial variables.

The multiple comparison Regression models were created with ladder scores kept as dependent variables and MDAS, the DNS, the Revised Dental Beliefs Survey, caries experience, and gender as independent variables it showed a statistically significant relation between the ladder scores, dental anxiety and caries experience. [Table 3]

<table>
<thead>
<tr>
<th>Ladder scores</th>
<th>Total (n)</th>
<th>Males (n)</th>
<th>Females (n)</th>
<th>MDA Scores</th>
<th>DNS</th>
<th>RDBS</th>
<th>DMFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>201</td>
<td>91</td>
<td>110</td>
<td>12.85(4.5)</td>
<td>21.49(3.31)</td>
<td>45.31(12.51)</td>
<td>1.33</td>
</tr>
<tr>
<td>Rural</td>
<td>257</td>
<td>163</td>
<td>94</td>
<td>11.12(3.56)</td>
<td>20.75(3.71)</td>
<td>46.05(13.8)</td>
<td>1.67</td>
</tr>
<tr>
<td>Ladder scores 1</td>
<td>171</td>
<td>93</td>
<td>78</td>
<td>13.21(3.9)</td>
<td>21.38(3.38)</td>
<td>44.17(13.58)</td>
<td>3.85(2.07)</td>
</tr>
<tr>
<td>Ladder scores 2</td>
<td>15</td>
<td>8</td>
<td>7</td>
<td>12.4(4.18)</td>
<td>21.26(3.28)</td>
<td>45.46(8.21)</td>
<td>0.266(0.45)</td>
</tr>
<tr>
<td>Ladder scores 3</td>
<td>86</td>
<td>47</td>
<td>39</td>
<td>12.59(4.7)</td>
<td>20.43(4.28)</td>
<td>45.83(13.5)</td>
<td>2.76(1.98)</td>
</tr>
<tr>
<td>Ladder scores 4</td>
<td>74</td>
<td>52</td>
<td>22</td>
<td>10.86(3.01)</td>
<td>21.87(3.24)</td>
<td>51.58(13.0)</td>
<td>0.90(1.14)</td>
</tr>
<tr>
<td>Ladder scores 5</td>
<td>112</td>
<td>52</td>
<td>60</td>
<td>9.78(3.46)</td>
<td>20.57(3.31)</td>
<td>44.10(12.3)</td>
<td>1.33(2.1)</td>
</tr>
</tbody>
</table>
Values in parenthesis represent standard deviation

Table 2: Pearson product-moment correlation between ladder scores and the psychosocial variables.

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Dental Belief</th>
<th>Dental Anxiety</th>
<th>Dental neglect</th>
<th>DMFT</th>
<th>Gender</th>
<th>Ladder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.00</td>
<td>0.09</td>
<td>-0.007</td>
<td>-0.11</td>
<td>0.07</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Dental Belief</td>
<td>0.09</td>
<td>1</td>
<td>0.2**</td>
<td>0.06</td>
<td>-0.14*</td>
<td>0.1</td>
<td>0.01</td>
</tr>
<tr>
<td>Dental Anxiety</td>
<td>-0.007</td>
<td>0.2**</td>
<td>1</td>
<td>0.09</td>
<td>-0.07</td>
<td>-0.03</td>
<td>-0.42**</td>
</tr>
<tr>
<td>Dental neglect</td>
<td>-0.11</td>
<td>0.06</td>
<td>0.09</td>
<td>1</td>
<td>-0.09</td>
<td>-0.2**</td>
<td>-0.01</td>
</tr>
<tr>
<td>DMFT</td>
<td>0.07</td>
<td>-0.14</td>
<td>-0.07</td>
<td>-0.09</td>
<td>1</td>
<td>-0.1*</td>
<td>-0.01</td>
</tr>
<tr>
<td>Gender</td>
<td>0.01</td>
<td>0.1</td>
<td>-0.03</td>
<td>-0.22**</td>
<td>-0.12</td>
<td>1</td>
<td>-0.07</td>
</tr>
<tr>
<td>Ladder</td>
<td>0.01</td>
<td>0.01</td>
<td>-0.42**</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.07</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3: Regression models with ladder scores kept as dependent variable and MDAS, the DNS, the Revised Dental Beliefs Survey, caries experience, and gender and as independent variables.

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Constant</td>
<td>4.234</td>
<td>0.598</td>
</tr>
<tr>
<td>Gender</td>
<td>0.301</td>
<td>0.156</td>
</tr>
<tr>
<td>Place</td>
<td>-0.083</td>
<td>0.060</td>
</tr>
<tr>
<td>Dental Anxiety</td>
<td>-0.149</td>
<td>0.018</td>
</tr>
<tr>
<td>Dental Neglect</td>
<td>-0.031</td>
<td>0.021</td>
</tr>
<tr>
<td>DMFT</td>
<td>-0.007</td>
<td>0.036</td>
</tr>
<tr>
<td>Dental belief total</td>
<td>0.017</td>
<td>0.006</td>
</tr>
</tbody>
</table>

*- p value significant
**- p value highly significant

Discussion

Adolescence is described as a transitional phase between childhood and adulthood, with a biological beginning (puberty) and a social ending\textsuperscript{14}, they form the main bulk of population worldwide, around 1 in every 6 person in this world is an adolescent which numbers to around 1.2 billion people aged 10 to 19. Adolescents are a vulnerable group and are the bridges between the young and the old and are often the population that is routinely missed for screening especially for dental diseases. Many serious diseases in adulthood have their roots in adolescence and catching them younger seems the best preventive.

In the present study the mean dental anxiety scores were 9.8(1.5-4.4) and dental neglect scores 3.5 (1.5 – 4.6) and dental beliefs scores were 87.4 (40-163). The dental anxiety scores were similar to the studies conducted by Appukuttan et al\textsuperscript{15} and Fotedar et al\textsuperscript{16} in India, but
contrasts to the studies done by Pratima et al\textsuperscript{17}, Marya et al\textsuperscript{18} and Tunc et al\textsuperscript{19}. Where the dental anxiety scores were higher among participants as all these studies were hospital based studies and the mean age of participants was higher than that of the our study. The scores in the dental belief scales were similar to that of studies conducted by Coolidge et al\textsuperscript{13}. The main aspect of this study was to assess the relationship between dental ladder scores and that of all three scales namely MDAS\textsuperscript{11}, DNS\textsuperscript{12} and R-DBS\textsuperscript{13}.

The regression analysis where the dependent variable was dental ladder and afore mentioned variables resulted that the dental ladder scores which predicted dental avoidance among Indian adolescents was strongly associated with dental anxiety and dental neglect but weekly associated with dental belief which corresponded to many studies in literature\textsuperscript{5} and this might be explained by the less frequent dental visiting of many fearful people. The objectives of this study were to investigate differences between dentally fearful people who regularly attend the dentist and fearful people who infrequently visit the dentist. A random sample of 1,082 Australians ! 15 yr of age completed a mailed questionnaire (response rate = 71.6\%,\textsuperscript{20,21,22} The root cause of dental avoidance is probably a dynamic phenomenon with a root cause that remains constant. Very few dynamic conclusions can be sought for as to why people do not visit dentist but underlying dental anxiety seems to play a very important factor.

The present study aims at finding what stage the individuals are in their phase of change and tries to quantify the differing psychosocial characters that effect dental absenteeism. This study showed that an adolescent with lower ladder scores (no thoughts of going to dentist) had higher dental anxiety scores, higher dental neglect scores and lower dental beliefs score. Whereas higher ladder scores had strikingly opposite finding and all these values were statistically significant. This makes it clearer that dental absenteeism is a frame of mind similar to habit, as the present area of study is located in such an area where there is abundance of dental care providers.

The most important feature of this ladder is its graphical representation of the stage of which the subject is in, with direct and explicit words for each of the stages. Once this is evaluated the subjects then can be treated accordingly as to what intervention is required for the specific stage\textsuperscript{7}. The correlation of ladder with dental anxiety and dental belief as demonstrated in this study can also pave way as a substitute to the heavier load of questions, allowing the use of a fast and easy application in order to determine the state for changes.\textsuperscript{23}

Conclusion

The study is especially important from the perspective that it opens newer insights on dental absenteeism as no other study in dental literature could be retrieved on this population with relation to the use of the dental ladder. Nevertheless, this descriptive analytical study provides a new dimension for future research in the different socio economic and geographical settings. The graphical representation of the ladder is much more simpler than any questionnaire and provides a base for further research as adolescents form an important cohort in the community which if neglected might form a serious public health concern in future.

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Acknowledgements of support & assistance- Nil

Conflict of Interest- Nil

Consent: Participants gave written informed consent before answering the questionnaire and undergoing an oral examination

References


Prevalence of Use of Tobacco Products among Aizawl Population

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Abstract

Diseases arising due to usage of tobacco is one of the most common cause of premature death & disability around the world. In 3rd round of Nationwide survey across India held in 2005-06 by National Family Health Survey estimated that tobacco consumption habit was among 57.6% males & 10.8% females. Mizoram is a small hilly state located in Northeast of India.

Aims & Objective: (a) Pattern & Prevalence of use of tobacco among local population (b) Reasons for tobacco consumption (c) Attitude and knowledge regarding tobacco consumption.

Materials & Method: 275 patients reporting for dental treatment was selected for the study. Data was recorded in Microsoft Excel software and SPSS Version 19 was used. To analyse the association between the different parameters Chi square test was applied & the level of significance for the present study was fixed at p≤0.05.

Results: 80% of the sample had some or other form of tobacco habit. Smoking was more prevalent among males (64.5%) whereas tobacco chewing was more common among females (77.5%). Habit of tobacco chewing was highest among house wife 48.3%. Smoking among students was 32.3 %.

Conclusion: High percentage of tobacco use is not due to ignorance or illiteracy but due to social custom, habit & acceptance of the same in the society. State government will have to strictly implement the tobacco control mechanism. Sale & consumption of tobacco in public will have to be banned legally.

Key-words: Tobacco, Population, Smoking, Prevalence, Store, Myeloperoxidase (MPO)

Introduction

Tobacco consumption and related diseases is one of the major health challenges that developing countries like India face. Of the total population of India roughly 70% of the population reside in rural area and most of them depend on agriculture for livelihood & belong to low socio-economic status and habit of tobacco is very high among them.

Side effects / diseases arising due to usage of tobacco is one of the most common cause of premature death & disability around the world.¹ Situation is very alarming especially in the developing countries as most of the disease arising due to usage of tobacco is preventable in nature & related to one’s lifestyle. On an average 4.9 million² death occurring annually may be due to usage of tobacco and if this trend continues roughly 10 million² population is expected to die by the year 2020 with 70%² of them will be from developing countries. Based on some studies about 2/3rd of the world population addicted to tobacco/smoking belong to either developing or under developed countries and if this trend continues it may leads to 8.3 million deaths annually by the year 2030³ with 80% of them being from low & middle per capital
Prevalence of consumption of one or other form of tobacco among the world population is well documented. There have been instances wherein the individual having tobacco & smoking habit and suffering from cancer, cardiovascular, respiratory disease or any other health problem are likely to develop more systematic problems & die prematurely than the non smokers.

In 3rd round of Nationwide survey across India held in 2005-06 by National Family Health Survey stated that there is widespread usage of tobacco among males 57.6% whereas among females it is 10.8%. India being the most populated country is also the second largest producer & usage of tobacco & related products in the world. Usage of both the forms of tobacco i.e smokeless & smoking is very high among the Indian population.

Mizoram is a small hilly state located in Northeast of India. Aizawl being the capital of the state has one district hospital and numerous private dental practitioners. To know the prevalence and pattern of tobacco use among the population is important as this information may be utilized to enable laws, measures & develop strategies for effective tobacco control. Thus a questionnaire based study was carried with the aim and objective to assess the

(a) Pattern & prevalence of use of tobacco among local population
(b) Reasons for tobacco consumption
(c) Attitude and knowledge regarding tobacco consumption

Materials And Method

Study Area

According to census survey 2011 Aizawl city is very progressive in terms of literacy, sex ratio, and population growth. Aizawl has a population of 400309 of which male and female were 199270 and 201039 respectively. Average literacy rate was 97.89%. With regards to Sex Ratio, it stood at 1009 per 1000 male. 78.63% of population or 3,14,754 people lived in urban region of which 1,55,490 are males & 1,59,264 are females with a Sex Ratio 1024 per 1000 male. 21.37% population or a total of 85,555 of population lives in rural area; of these 43,780 are males and 41,775 are females with a sex ratio of 954 females per 1000 males.

Study Design

It’s a questionnaire based study. Questionnaire was prepared in both English and local Mizo language for the convenience of the patients. A local interpreter was used to communicate with the study subjects.

Sample Size

275 study subjects were selected for the study. Out of these 12 questionnaires were rejected due to errors in filling up the form.

Statistical Data Analysis

The data was recorded in Microsoft excel software & SPSS version 19 was used to study the data.

To analyze the association between the different parameters Chi Square test was applied & the level of significance for the present study was fixed at p≤0.05.

Results

Socio-Economic Distribution

Out of 263 subjects 111 (42%) of the subjects were male and 152 (58%) were females. Among these 71(27%) of the sample belonged to rural area & 192(73%) belonged to urban area Table 1. Maximum 79(30%) of the subjects belonged to the age group of 31-40 yrs followed by 69(26%) in the age group of 18-24 yrs. 88.6% of the study sample were literate. 30(11%) of the respondent were illiterate. 191(72.6%) of the respondent belonged to middle class followed by 47(17.9%) belonging to low socio-economic status. 80(30.4%) of the female respondents were housewife followed by 69(26.2%) sample in service.

Personal Habit

Majority of the respondents 118(44.9%) and 182(69.2%) underwent only emergency medical and dental treatment as and when required. Only 19(7.2%) of the responden underwent regular dental check up. A very high percentage of the sample 80.6% had some or other form of oral habit. Among them 45.6% had tobacco chewing habit followed by 11.8% who had smoking habit; 21.7% of the sample having more than one habit Graph 1. High prevalence of chewing tobacco and smoking 93 (77.5%) & 11 (35.5%) respectively
was found among the female study subjects Table 2. About 57 (47.5%) of the subjects studied up to high school had tobacco chewing habit whereas 15 (48.4%) of the graduate had smoking habit. Habit of tobacco chewing and smoking was most common among the middle income group subjects 90 (75%) & 26 (83.9%) respectively. 58 (48.3%) of the housewife had habit of tobacco chewing followed by self employed 27 (22.5%) & service 25 (20.8%) subjects.

Among the respondents having oral habit 42% of the subjects used 10-20 tobacco packets/cigarette in a day followed by 25.9% having less than 10 quantities and 11.3% having more than 30 quantities Graph 2. About 43.6% of the respondents chewed & kept the tobacco product in their moth for 10-20 minutes.

Knowledge about Tobacco Chewing

90.1% respondent knew that chewing tobacco or smoking is injuries to health whereas 9.1% were not bothered about the consequences or harmful effects. About 37.3% of the subjects knew about harmful effects from the TV/Print media followed by 27% from friends and family. Only 12.5% of the respondent knew about the harmful effects from the government banners and posters. Only 28.5% of the respondents were willing to quite the oral habit voluntarily but a good number of them 25.6% refused to do so were as 26.6% of them said they may try to quite.

Tobacco Habit & Respondent

91% of the respondent bought the tobacco product from shop. 71(33.49%) had the habit of chewing & then swallowing the tobacco product while 52(24.52%) of them kept the tobacco product & then spit it. About 67(31.6%) of the respondent started the habit on their own wish whereas 86(40.6%) of the subject answered with more than one option. Despite knowing the hazards of tobacco usage 58(27.4%) subjects stated that it has become a habit as the reason of continued usage of the tobacco product whereas 66(31.1%) & 17(8%) reported to use it as a favourite time pass & for social reasons respectively. 55(51.4%) of the respondents had no specific time of usage of tobacco product while 51(24.1%) used to have it after food.

Table 1: Comparison of Biochemical parameters between CKD-ND and CKD-DM groups

<table>
<thead>
<tr>
<th>S. No</th>
<th>TYPE</th>
<th>Male %</th>
<th>Female %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gender</td>
<td>111(42%)</td>
<td>152 (58%)</td>
<td>263</td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>18 - 24</td>
<td>29 (26.2%)</td>
<td>40 (26.3%)</td>
<td>69 (26.2%)</td>
</tr>
<tr>
<td>1</td>
<td>25 - 30</td>
<td>21 (18.9%)</td>
<td>36 (23.7%)</td>
<td>57 (21.7%)</td>
</tr>
<tr>
<td>1</td>
<td>31 - 40</td>
<td>31 (27.9%)</td>
<td>48 (31.6%)</td>
<td>79 (30.0%)</td>
</tr>
<tr>
<td>1</td>
<td>41 - 50</td>
<td>20 (18.0%)</td>
<td>18 (11.8%)</td>
<td>38 (14.4%)</td>
</tr>
<tr>
<td>1</td>
<td>50 &amp; Above</td>
<td>10 (9.0%)</td>
<td>10 (6.6%)</td>
<td>20 (7.6%)</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Illiterate</td>
<td>08 (7.2%)</td>
<td>22 (14.5%)</td>
<td>30 (11.4%)</td>
</tr>
<tr>
<td>2</td>
<td>10th Std</td>
<td>26 (23.4%)</td>
<td>28 (18.4%)</td>
<td>54 (20.5%)</td>
</tr>
<tr>
<td>2</td>
<td>High School</td>
<td>47 (42.3%)</td>
<td>65 (42.8%)</td>
<td>112 (42.6%)</td>
</tr>
<tr>
<td>2</td>
<td>Graduate</td>
<td>30 (27.0%)</td>
<td>37 (24.3%)</td>
<td>67 (25.5%)</td>
</tr>
<tr>
<td>3</td>
<td>Socio-economic Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>24 (21.6%)</td>
<td>23 (16.1%)</td>
<td>47 (17.9%)</td>
</tr>
<tr>
<td>3</td>
<td>Middle</td>
<td>77 (69.4%)</td>
<td>114 (75.0%)</td>
<td>191 (72.6%)</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
<td>10 (9.0%)</td>
<td>15 (9.9%)</td>
<td>25 (9.5%)</td>
</tr>
<tr>
<td>4</td>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Housewife</td>
<td>00 (00%)</td>
<td>80 (52.6%)</td>
<td>80 (30.4%)</td>
</tr>
<tr>
<td>4</td>
<td>Self-Employed</td>
<td>43 (38.8%)</td>
<td>21 (13.8%)</td>
<td>64 (24.3%)</td>
</tr>
<tr>
<td>4</td>
<td>Service</td>
<td>47 (42.3%)</td>
<td>22 (14.5%)</td>
<td>69 (26.2%)</td>
</tr>
<tr>
<td>4</td>
<td>Student</td>
<td>21 (18.9%)</td>
<td>29 (19.1%)</td>
<td>50 (19.0%)</td>
</tr>
<tr>
<td>5</td>
<td>Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rural</td>
<td>36 (32.4%)</td>
<td>35 (23.0%)</td>
<td>71 (27.0%)</td>
</tr>
<tr>
<td>5</td>
<td>Urban</td>
<td>75 (67.6%)</td>
<td>117 (77.0%)</td>
<td>192 (73.0%)</td>
</tr>
</tbody>
</table>
Table 2: Association between Tobacco Usage & Socio-Demographic Characteristic *

<table>
<thead>
<tr>
<th></th>
<th>Smoking</th>
<th>Chewing Tobacco</th>
<th>Alcohol</th>
<th>More than 1 habit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20 (64.5%)</td>
<td>27 (22.5%)</td>
<td>4</td>
<td>43 (75.4%)</td>
</tr>
<tr>
<td>Female</td>
<td>11 (35.5%)</td>
<td>93 (77.5%)</td>
<td>0</td>
<td>14 (24.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>120</td>
<td>4</td>
<td>57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Smoking</th>
<th>Chewing Tobacco</th>
<th>Alcohol</th>
<th>More than 1 habit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>2 (6.5%)</td>
<td>19 (15.8%)</td>
<td>1 (25%)</td>
<td>5 (8.8%)</td>
</tr>
<tr>
<td>10th std</td>
<td>3 (9.7%)</td>
<td>21 (17.5%)</td>
<td>1 (25.5%)</td>
<td>20 (35.1%)</td>
</tr>
<tr>
<td>High School</td>
<td>11 (35.5%)</td>
<td>57 (47.5%)</td>
<td>0</td>
<td>18 (31.6%)</td>
</tr>
<tr>
<td>Graduate</td>
<td>15 (48.4%)</td>
<td>23 (19.2%)</td>
<td>2 (50%)</td>
<td>14 (24.6%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Socio-Economic Status</th>
<th>Smoking</th>
<th>Chewing Tobacco</th>
<th>Alcohol</th>
<th>More than 1 habit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1 (3.2%)</td>
<td>25 (20.8%)</td>
<td>0</td>
<td>18 (31.6%)</td>
</tr>
<tr>
<td>Middle</td>
<td>26 (83.9%)</td>
<td>90 (75%)</td>
<td>4</td>
<td>31 (54.4%)</td>
</tr>
<tr>
<td>High</td>
<td>4 (12.9%)</td>
<td>5 (4.2%)</td>
<td>0</td>
<td>08 (14%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Smoking</th>
<th>Chewing Tobacco</th>
<th>Alcohol</th>
<th>More than 1 habit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housewife</td>
<td>1 (3.2%)</td>
<td>58 (48.3%)</td>
<td>0</td>
<td>8 (14%)</td>
</tr>
<tr>
<td>Self-Employed</td>
<td>10 (32.3%)</td>
<td>27 (22.5%)</td>
<td>2 (50%)</td>
<td>19 (33.3%)</td>
</tr>
<tr>
<td>Service</td>
<td>10 (32.3%)</td>
<td>25 (20.8%)</td>
<td>2 (50%)</td>
<td>20 (35.1%)</td>
</tr>
<tr>
<td>Student</td>
<td>10 (32.3%)</td>
<td>10 (8.3%)</td>
<td>0</td>
<td>10 (17.5%)</td>
</tr>
</tbody>
</table>

*All differences significant at p≤0.05

Table 3 Knowledge about Tobacco Chewing (N=263)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Male %</th>
<th>Female %</th>
<th>All %</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTIVATE OTHERS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>81 (73.0%)</td>
<td>132 (86.8%)</td>
<td>213 (81.0%)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>26 (23.4%)</td>
<td>20 (13.2%)</td>
<td>46 (17.5%)</td>
</tr>
<tr>
<td>Always</td>
<td>4 (3.6%)</td>
<td>0 (0%)</td>
<td>4 (1.5%)</td>
</tr>
<tr>
<td>INJURIOUS TO HEALTH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96 (85.6%)</td>
<td>141 (92.8%)</td>
<td>236 (90.1%)</td>
</tr>
<tr>
<td>No</td>
<td>02 (1.8%)</td>
<td>0 (0.0%)</td>
<td>02 (0.8%)</td>
</tr>
<tr>
<td>Not Bothered</td>
<td>13 (11.7%)</td>
<td>11 (7.2%)</td>
<td>24 (9.1%)</td>
</tr>
</tbody>
</table>

SOURCE OF KNOWLEDGE
**Table 3** Knowledge about Tobacco Chewing (N=263)

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MALE %</th>
<th>FEMALE %</th>
<th>All %</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV &amp; Print Media</td>
<td>40 (36.0%)</td>
<td>58 (38.2%)</td>
<td>98 (37.3%)</td>
</tr>
<tr>
<td>Banners &amp; Posters</td>
<td>19 (17.1%)</td>
<td>14 (9.2%)</td>
<td>33 (12.5%)</td>
</tr>
<tr>
<td>Friends &amp; Family</td>
<td>23 (20.7%)</td>
<td>48 (31.6%)</td>
<td>71 (27.0%)</td>
</tr>
<tr>
<td>Disclaimer During Movie</td>
<td>05 (4.5%)</td>
<td>06 (3.9%)</td>
<td>11 (4.2%)</td>
</tr>
<tr>
<td>More than one source</td>
<td>24 (21.6%)</td>
<td>26 (17.1%)</td>
<td>50 (19.0%)</td>
</tr>
</tbody>
</table>

**WILLING TO QUIT**

<table>
<thead>
<tr>
<th></th>
<th>MALE %</th>
<th>FEMALE %</th>
<th>All %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>28 (25.2%)</td>
<td>47 (30.9%)</td>
<td>75 (28.5%)</td>
</tr>
<tr>
<td>No</td>
<td>27 (24.3%)</td>
<td>40 (26.3%)</td>
<td>67 (25.6%)</td>
</tr>
<tr>
<td>Will Try</td>
<td>39 (35.1%)</td>
<td>31 (20.4%)</td>
<td>70 (26.6%)</td>
</tr>
<tr>
<td>Not Applicable (Non-Tobacco Users)</td>
<td>17 (15.3%)</td>
<td>34 (22.4%)</td>
<td>51 (19.4%)</td>
</tr>
</tbody>
</table>

*All differences significant at p≤0.05

**Table 4** Association between Tobacco Habit & Respondent (N=212)

<table>
<thead>
<tr>
<th>S. No</th>
<th>TYPE</th>
<th>MALE %</th>
<th>FEMALE %</th>
<th>All %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SOURCE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Own</td>
<td>03 (3.2%)</td>
<td>05 (4.2%)</td>
<td>08 (3.8%)</td>
</tr>
<tr>
<td></td>
<td>Shop</td>
<td>83 (88.3%)</td>
<td>110 (93.2%)</td>
<td>193 (91.0%)</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>06 (6.4%)</td>
<td>03 (2.5%)</td>
<td>09 (3.4%)</td>
</tr>
<tr>
<td></td>
<td>More than One Source</td>
<td>02 (2.1%)</td>
<td>00 (0%)</td>
<td>02 (0.8%)</td>
</tr>
<tr>
<td></td>
<td>HABIT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chew &amp; Spit</td>
<td>19 (20.21%)</td>
<td>24 (20.33%)</td>
<td>43 (20.28%)</td>
</tr>
<tr>
<td></td>
<td>Chew &amp; Swallow</td>
<td>30 (31.91%)</td>
<td>41 (34.74%)</td>
<td>71 (33.49%)</td>
</tr>
<tr>
<td></td>
<td>Keep &amp; Swallow</td>
<td>09 (9.57%)</td>
<td>08 (6.77%)</td>
<td>17 (8.01%)</td>
</tr>
<tr>
<td></td>
<td>Keep &amp; Spit</td>
<td>21 (22.34%)</td>
<td>31 (26.27%)</td>
<td>52 (24.52%)</td>
</tr>
<tr>
<td></td>
<td>More than 1 habit (5)</td>
<td>02 (2.12%)</td>
<td>03 (2.54%)</td>
<td>05 (2.35%)</td>
</tr>
<tr>
<td></td>
<td>Smoke (7)</td>
<td>13 (13.82%)</td>
<td>11 (9.32%)</td>
<td>24 (11.32%)</td>
</tr>
<tr>
<td></td>
<td>MOTIVATION &amp; START</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>16 (17.02%)</td>
<td>17 (14.40%)</td>
<td>33 (15.60%)</td>
</tr>
<tr>
<td></td>
<td>Own Wish</td>
<td>34 (36.17%)</td>
<td>33 (27.96%)</td>
<td>67 (31.60%)</td>
</tr>
<tr>
<td></td>
<td>Easy Availability</td>
<td>04 (4.25%)</td>
<td>09 (7.62%)</td>
<td>13 (6.1%)</td>
</tr>
<tr>
<td></td>
<td>Social Custom</td>
<td>07 (7.44%)</td>
<td>06 (5.08%)</td>
<td>13 (6.1%)</td>
</tr>
<tr>
<td></td>
<td>More than one source</td>
<td>33 (35.10%)</td>
<td>53 (44.91%)</td>
<td>86 (40.6%)</td>
</tr>
</tbody>
</table>

*Reason for usage*
<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Custom</td>
<td>06(6.4%)</td>
<td>06(5.1%)</td>
</tr>
<tr>
<td>Favourite Time Pass</td>
<td>27 (28.7%)</td>
<td>39(33.1%)</td>
</tr>
<tr>
<td>Became a Habit</td>
<td>28(29.8%)</td>
<td>30(25.4%)</td>
</tr>
<tr>
<td>Status Symbol</td>
<td>02(2.1%)</td>
<td>02(2.5%)</td>
</tr>
<tr>
<td>More than One reason</td>
<td>31(33.0%)</td>
<td>40(33.9%)</td>
</tr>
</tbody>
</table>

**Time of Usage**

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>01(1.1%)</td>
<td>04(3.4%)</td>
</tr>
<tr>
<td>Afternoon</td>
<td>01(1.1%)</td>
<td>03(2.5%)</td>
</tr>
<tr>
<td>Evening</td>
<td>06(6.4%)</td>
<td>00(00%)</td>
</tr>
<tr>
<td>No Specific Time</td>
<td>49(52.1%)</td>
<td>60(50.8%)</td>
</tr>
<tr>
<td>After Food</td>
<td>17(18.1%)</td>
<td>34(28.8%)</td>
</tr>
<tr>
<td>While Working</td>
<td>13(13.8%)</td>
<td>11(9.3%)</td>
</tr>
<tr>
<td>Multiple times</td>
<td>07(7.4%)</td>
<td>06(5.1%)</td>
</tr>
</tbody>
</table>

*All association significant at p≤0.05*

**Graph 1: Prevalence of Any Form of Tobacco/Alcohol**

**Graph 2: Frequency & Duration of Usage**
Discussion

The study results show widespread prevalence of tobacco chewing/smoking among the study population. Almost 8 out of 10 or 80% of the study subjects had some or other form of tobacco habit. The usage of tobacco is substantially high & when compared to national average of 35% among Indian population and when compared to 67.6% of Mizoram population having oral habit in a study by H K Chaturvedi & et al. It may be due to study being conducted at a dental centre were majority of the study population were dental patient and it is well established fact that use of tobacco products leads to dental disease among others. 45.6% of the respondent used smokeless tobacco much higher than the national average of 21% & 11% used to smoke as compared to national average of 9%. The combined usage of some or other form of oral habit was 21.7% much higher to national usage of 5%.

Use of any form of tobacco among male was 43.26% less when compared to national average of 48% but similar to a study by H K Chaturvedi et al among Mizoram population and that among females was 56.73% higher when compared to national average of 20% and 45.7% in a study by H K Chaturvedi et al. Smoking was more prevalent among males (64.5%) whereas tobacco chewing was more common among females (77.5%) indicating presence of sex differences in tobacco use pattern. Similar results were found in as study by H K Chaturvedi & Giovini et al. Use of tobacco among Indian women show quantum jump of 11% in the year 2005-06 to 20% in the year 2009-10 as reported by Durgesh Nandan Jha. Habit of tobacco chewing was highest among the house wife 48.3% followed by employed samples (20.8%) similar to study by H K Chaturvedi. Overall use of tobacco among student respondent was 14.15% similar to a study by C T Sreeramareddy et al & by H K Chaturvedi et al. Smoking among students was 32.3 % similar to a study by DN Sinha et al wherein smoking among Mizoram student was 34.5% highest among the eight Northeastern states.

Easy availability and being offered by friends was cited by 6.1% & 15.6% as reasons for motivation to start oral habit with 40.6% of the respondent choosing more than one reason. Similar reasons were cited by the subjects in study by D N Sinha & PC Gupta on medical students of Patna & by Urvashi J et al on urban population of Jamnagar city in Gujarat. 91% of the respondent bought tobacco from the shop as these products are freely available & consumption is widely accepted in the society similar to national average where 87% of the Indian Population bought the product from stores/shops. 25.9% of the respondent used to have 10 packets/cigarettes of tobacco product which is similar to national average of 25%. 42% of the subjects had 10-20 pkts/cigarette in a day much higher when compared to similar study by Urvish J et al.

28.5% of the respondent was willingly to quite the habit similar to other studies by JD Sargent but less when compared to national average of 35% who are willingly to quite. 25.6% of the respondent were a concern as they were not willingly to quite the habit despite 90% of the subjects knowing that tobacco usage is injurious to health. Similar response was given by adult population during the national health survey study. 37.3% of the subjects knew about the hazardous of tobacco habit from TV/Print Media similar to response during national tobacco survey followed by 27% from friends & family and only 12.5% from government banners and posters much lower when compared to national average.

Prevalence of malaria is very high in North Eastern states of India particularly Mizoram were 7359/100000 population suffered from the disease; almost double that of national average of 3697/100000 population. Tobacco was used as medicinal/therapeutic value very long time back. Tobacco used to be administered orally for malaria/intermittent fever when allopathic treatment was not available. Since malaria was very common use of tobacco as medicinal product was also very common among the masses. This may be one of the reasons for high percentage of tobacco usage and also habit of population who either chew/keep & swallow the tobacco product as they may have learnt it from their ancestors.

Conclusion

Our study concludes that in the state of Mizoram use of tobacco is exceptionally high as compared to national across the various categories like gender, sex, occupation and education etc. This high percentage is not due to ignorance or illiteracy but mostly due to the social custom, habit and acceptance of the same in the society. Almost all the respondent knew about the harmful effect but still used the tobacco product as it is freely available and consumption is not considered a
bad habit among the common masses. Government & health officials will have to take proactive measures and bring about behavioural change among the population to tackle this menace. Owing to severe side effects of tobacco usage WHO in 2005 asked various countries to implement Framework Convention on tobacco control. Many countries including India took proactive measures such as high taxes, bigger pictorial warnings on packs, public awareness etc, so as to bring down the widespread usage of tobacco among the masses. Because of these proactive measures worldwide smoking among the people decreased by almost a third 29.4% to 15.3% between the years 1990 to 2015.  

State government will have to strictly implement the tobacco control mechanism. Sale & consumption of tobacco in public should be banned. The use of tobacco products among women is also high and specific health programmes targeting the particular gender should be implemented. It should emphasize on the fact that usage of tobacco not only affects one’s personal health but is hazardous to the health of her spouse, her embryo & children and affects the society as whole.

References


18. Sushmi Dey. India among Nations Accounting for 50% of Smoking Deaths. The Times of India, New Delhi, 2017 Apr 06
Prevalence of Voiding Dysfunction and its Impact on Quality of Life among Perimenopausal Women: A Community based Study

Kavita Choudhary¹, Maharaj Singh²

¹Lecturer, Department of Nursing, Bee Enn Nursing Institute, Chak Bhalwal, Jammu, India, ²Associate Professor, Department of Nursing, NIMS Nursing College, NIMS University, Jaipur, Rajasthan, India

Abstract

Voiding Dysfunction is one of the common non life-threatening medical condition among perimenopausal women worldwide. Nearly one third of women face voiding problems during their life and it may affect their physical, mental, social, and overall health related quality of life. The aim of this study was to assess prevalence of voiding dysfunction and its impact on quality of life among perimenopausal women. The total 390 perimenopausal women in the age group of 40 – 60 years were selected through purposive sampling technique from selected area of Hoshiarpur, Punjab. International Consultation on Incontinence Questionnaire – Female Lower Urinary Tract System (ICIQ- FLTUS) was used for assessing prevalence of voiding dysfunction and modified King’s Health Questionnaire was used for assessing quality of life. The collected data were tabulated and analysed by using descriptive and inferential statistics. The study findings revealed that out of 390 perimenopausal women, 96(24.61%) suffer with voiding dysfunction. Out of 96 perimenopausal women with voiding dysfunction, 38(39.59%) had mild impact, 53(55.21%) had moderate impact, and 5(5.20%) had severe impact on quality of life. There was statistical significant relationship found between quality of life and age (F=3.38, p=0.02), education (F=4.18, p=0.003), occupation (t=2.89, p=0.04), family income (F=3.28, p=0.02) and type of delivery (t=1.98, p=0.05) of perimenopausal women with voiding dysfunction. The voiding dysfunction is an existing health problem among perimenopausal women and it had impact on quality of life.

Keywords: Prevalence, Quality of life, Voiding dysfunction, Perimenopausal women

Introduction

A woman’s reproductive system is a delicate and complex system in the body. Women reproductive life is cyclical in nature. Puberty and perimenopause demarcate the beginning and end of the female reproductive life cycle and are two major transitions in a woman’s life.¹

Perimenopause is the time period during which women’s body shifts more or less from regular ovulation and menstrual periods towards permanent infertility or menopause. Perimenopausal age usually starts in a woman’s mid to late 40s and remain in this transitory state for approximately 4–5 years before reaching menopause.² Irregular menstrual periods are one of the first signs of perimenopause. Estrogen is a hormone that helps to regulate the menstruation and keeps the bladder and urethra healthy and functioning properly. As a woman reaches near to the stage of menopause the estrogen level begins dropping and this lack of estrogens may cause the pelvic muscles to weaken. They may no longer be able to control bladder as they did before. As estrogens levels continue to drop throughout, the symptoms of voiding dysfunction may become worse.³

Voiding dysfunction is a common, distressing, non life- threatening condition in which there is a
poor coordination between the bladder muscle and the urethra. According to the American College of Physicians, about 50% of women between the ages of 40 to 60 years and nearly 75% of women over the age of 75 years, have symptoms of voiding dysfunction in the form of urinary incontinence, voiding and filling symptoms. As per various research study findings report perimenopausal women with voiding dysfunction suffer with wide range of symptoms, which include hesitancy, weak stream, intermittency, straining to void, spraying or a split stream, incomplete bladder emptying, a need to immediately re-void, position-dependent micturition and postmicturition dribbling. Sometimes women complain of concomitant stress and/or urge urinary incontinence.

Voiding dysfunction is a silent global epidemic and it is associated with high economic costs, psychological morbidity and adverse effects on the quality of life. Quality of Life is a broad ranging concept affected in a complex way by the person’s physical health, psychological state, levels of independence, social relationships, personal beliefs and their relationship to salient features of their environment. Numerous recent research study findings indicate that voiding dysfunction in whichever form, sweepingly affect the life of the women. It generates feelings of anger, sadness, embarrassment and depression. Women may avoid social gatherings and lose self-confidence, which has a proportional impact on their social interactions, sexual life and emotional health.

In the light of above facts and personal experiences, voiding dysfunction among female population is quite a common health problem and it may affect the quality of life in various ways. Hence, the researcher strongly felt the need of assessing the prevalence of voiding dysfunction and its impact on quality of life among perimenopausal women.

Material And Method

This was a quantitative non experimental study with descriptive cross sectional design conducted in the month of April 2017 among 390 perimenopausal women in the age group of 40 to 60 years in selected rural community of Sataur, Hoshiarpur District of Punjab. The sample size was determined based on the results of a pilot study and was computed by power analysis. The samples were selected through nonprobability purposive sampling technique. The inclusion criteria for sample selection included: Perimenopausal women in the age group of 40 to 60 years willing to participate in the study. The exclusion criteria included: perimenopausal women with any gynaecological disorder, surgical menopause and on hormonal therapy.

To execute the study, the researcher obtained official written permission from the Sarpanch of selected village and written informed consent from perimenopausal women after explaining the study purpose and assuring for confidentiality and anonymity. The structured tool was used for data collection and it consisted of three sections. Section A: Socio-demographic variables of perimenopausal women: It consisted of 9 variables including age, education, occupation, type of family, family income, religion, type of delivery and history of gynecological surgery. Section B: Standardized ICIQ-FLUTS (International consultation on incontinence questionnaire- female lower urinary tract system) questionnaire: It consisted of total 12 items under 3 subscales as filling, voiding and incontinence symptoms, to assess the prevalence of voiding dysfunction. If there was presence of 3 or more symptoms then women was considered to have voiding dysfunction. Section C: Modified King’s Health Questionnaire: It consisted of 29 items under eight domains of quality of life ( general health – 2 items, role limitation-2 items, physical/social limitation-4 items, personal relationship – 3 items, emotions- 3 items, sleep/energy- 2 items, coping measures- 4 items, urinary symptoms- 9 items) was used to assess the impact of voiding dysfunction on quality of life among perimenopausal women. Each item was scored against four points from 1 to 4. The total score of the items in each category was added to yield a total raw score. Total raw score was ranging between 29 to116 and it was interpreted in terms of impact on quality of life as mild impact (≤ 40%), moderate impact (41-60%), and severe impact (61-100%). The tool was translated in to Hindi and tested by back translation into English.

The content validity of tool was obtained from the six experts in the field of medicine and nursing. Reliability of tool was checked by test-retest method and it was found 0.96 for ICIQ – FLUTS Questionnaire and 0.92 for modified King’s health questionnaire, hence both tools was considered reliable for data collection. During data collection, the perimenopausal women’s of 40-60 years were identified and screened for voiding dysfunction through ICIQ – FLUTS Questionnaire, following this the assessment of impact of voiding dysfunction on
quality of life was done through modified Kings Health Questionnaire. The collected data was tabulated and analyzed in accordance with objectives of the study by using descriptive and inferential statistics with the help of Statistical Package for the Social Sciences version 16 software (SPSS Inc., Chicago, IL, USA) and Instat.

Findings

The socio-demographic variables of perimenopausal women showed that, majority of perimenopausal women were, in the age group of 55-60 years (36.92%), educated up to secondary class (32.05%), married (73.33%), working (57.17%), living in joint family (58.20%), having family income between 20,001-30,000 ₹/month (40.51), belongs to Sikh religion (80.25%), having normal vaginal delivery (85.12%), and having no history of gynaecological surgery (91.28%)

As per the prevalence of voiding dysfunction among perimenopausal women, out of 390 perimenopausal women, 96(24.61%) were sufferers with voiding dysfunction. Among them, 38(39.58%) were having incontinence symptoms, 33(34.37%) were having voiding symptoms and 25(26.05%) were having filling symptoms.

Figure 1: Percentage distribution of perimenopausal women with voiding dysfunction as per levels of impact on quality of life

Figure 1 depicts that, among the perimenopausal women with voiding dysfunction, almost one third i.e. 38(39.59%) had mild impact, almost half i.e. 53(55.21%) had moderate impact, and least i.e.5 (5.20%) had severe impact on quality of life.

Table 1: Mean, mean percentage and rank order of domains of quality of life among perimenopausal women with voiding dysfunction

<table>
<thead>
<tr>
<th>Domains of Quality of Life</th>
<th>Maximum score</th>
<th>Mean score</th>
<th>Mean %</th>
<th>Rank order</th>
</tr>
</thead>
<tbody>
<tr>
<td>General health</td>
<td>8</td>
<td>3.51</td>
<td>43.87</td>
<td>2</td>
</tr>
<tr>
<td>Role limitation</td>
<td>8</td>
<td>2.91</td>
<td>36.37</td>
<td>5</td>
</tr>
<tr>
<td>Physical/social limitation</td>
<td>16</td>
<td>5.02</td>
<td>31.37</td>
<td>7</td>
</tr>
<tr>
<td>Personal relationships</td>
<td>12</td>
<td>2.81</td>
<td>23.41</td>
<td>8</td>
</tr>
<tr>
<td>Emotions</td>
<td>12</td>
<td>4.34</td>
<td>36.16</td>
<td>6</td>
</tr>
<tr>
<td>Sleep/energy</td>
<td>8</td>
<td>3.39</td>
<td>42.37</td>
<td>3</td>
</tr>
<tr>
<td>Coping measures</td>
<td>16</td>
<td>5.85</td>
<td>36.56</td>
<td>4</td>
</tr>
<tr>
<td>Urinary symptoms</td>
<td>36</td>
<td>16.08</td>
<td>44.66</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1 shows that, the highest impact of voiding function was observed on urinary symptoms (44.66%) domain of quality of life this was followed by general health (43.87%), sleep/energy (42.37%), coping measures (36.56%), role limitation (36.37%), emotions (36.16%), physical/social limitation (31.37%) and personal relationship (23.41%) domains of quality of life.

Table 2 demonstrate that, there was statistical significant relationship found between quality of life and age (F=3.38, p=0.02), education (F=4.18, p=0.003), occupation (t=2.89, p=0.04), family income (F=3.28, p=0.02) and type of delivery (t=1.98, p=0.05) of perimenopausal women with voiding dysfunction whereas other demographic variables were not significantly associated.
Table 2: Relationship between quality of life and selected socio-demographic variables of perimenopausal women with voiding dysfunction

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Socio-demographic variables</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Test value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age (in years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-45</td>
<td>24</td>
<td>39.16</td>
<td>9.36</td>
<td>F=3.38</td>
</tr>
<tr>
<td></td>
<td>45-50</td>
<td>18</td>
<td>42.05</td>
<td>9.55</td>
<td>p=0.02</td>
</tr>
<tr>
<td></td>
<td>50-55</td>
<td>18</td>
<td>46.31</td>
<td>11.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55-60</td>
<td>36</td>
<td>46.83</td>
<td>10.19</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>10</td>
<td>50.27</td>
<td>10.57</td>
<td>F=4.18</td>
</tr>
<tr>
<td></td>
<td>Upto primary</td>
<td>25</td>
<td>48.38</td>
<td>12.23</td>
<td>p=0.003</td>
</tr>
<tr>
<td></td>
<td>Upto secondary</td>
<td>31</td>
<td>41.34</td>
<td>10.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Senior secondary</td>
<td>18</td>
<td>41.94</td>
<td>7.53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graduate and above</td>
<td>12</td>
<td>38.00</td>
<td>6.13</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>72</td>
<td>43.58</td>
<td>10.00</td>
<td>F=2.08</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>02</td>
<td>30.00</td>
<td>0.00</td>
<td>p=0.12</td>
</tr>
<tr>
<td></td>
<td>Widow</td>
<td>22</td>
<td>45.56</td>
<td>9.84</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working</td>
<td>55</td>
<td>46.43</td>
<td>8.04</td>
<td>t=2.89</td>
</tr>
<tr>
<td></td>
<td>Non-working</td>
<td>41</td>
<td>40.46</td>
<td>11.60</td>
<td>p=0.04</td>
</tr>
<tr>
<td>5.</td>
<td>Type of family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nuclear</td>
<td>25</td>
<td>40.88</td>
<td>9.69</td>
<td>F=1.50</td>
</tr>
<tr>
<td></td>
<td>Joint</td>
<td>56</td>
<td>44.48</td>
<td>10.67</td>
<td>p=0.22</td>
</tr>
<tr>
<td></td>
<td>Extended</td>
<td>15</td>
<td>46.17</td>
<td>11.29</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Family income (₹/month)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>≤10,000</td>
<td>21</td>
<td>47.68</td>
<td>11.90</td>
<td>F=3.28</td>
</tr>
<tr>
<td></td>
<td>10,001-20,000</td>
<td>26</td>
<td>40.33</td>
<td>7.31</td>
<td>p=0.02</td>
</tr>
<tr>
<td></td>
<td>20,001-30,000</td>
<td>39</td>
<td>42.67</td>
<td>10.70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;30,000</td>
<td>10</td>
<td>49.27</td>
<td>11.23</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hindu</td>
<td>14</td>
<td>41.13</td>
<td>10.46</td>
<td>F=1.78</td>
</tr>
<tr>
<td></td>
<td>Sikh</td>
<td>78</td>
<td>43.83</td>
<td>10.35</td>
<td>p=0.17</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>4</td>
<td>51.40</td>
<td>13.84</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Type of delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal vaginal delivery</td>
<td>83</td>
<td>44.74</td>
<td>10.97</td>
<td>t=1.98</td>
</tr>
<tr>
<td></td>
<td>LSCS</td>
<td>13</td>
<td>38.93</td>
<td>6.49</td>
<td>p=0.05</td>
</tr>
<tr>
<td>9.</td>
<td>History of gynaecological surgery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>7</td>
<td>45.88</td>
<td>9.95</td>
<td>t=0.57</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>89</td>
<td>43.72</td>
<td>10.74</td>
<td>p=0.56</td>
</tr>
</tbody>
</table>

Discussion

Voiding dysfunction is a common health problem among women and has negative impact on women’s health and results in diminished overall quality of life. The present study aimed to assess prevalence of voiding dysfunction and its impact on quality of life among perimenopausal women.

In this study, the prevalence of voiding dysfunction among perimenopausal women was found 24.61%. Similarly, the studies conducted in Telangana and
Madhya Pradesh states of India reported the prevalence of urinary incontinence 10% and 18% respectively which is slightly lower than the prevalence of present study.\textsuperscript{11,12} On the other hand, International studies conducted in Nigeria, Qatar, Saudi Arabia and Turkey reported prevalence of voiding dysfunction/urinary incontinence from 12.6% to 44.6%.\textsuperscript{13-16} This wide difference in prevalence could be due to different socio-demographic population, cultural practices, health seeking behaviour of the women’s and availability of health care services. In the present study, the most common form of voiding dysfunction found among perimenopausal women was urinary incontinence symptoms. These findings are similar with the findings of the study conducted in Turkey and Saudi Arabia which revealed that the urinary incontinence is the most prevalent form of voiding dysfunction among women.\textsuperscript{15,16}

The findings of this study showed that most of the perimenopausal women with voiding dysfunction had mild to moderate impact on their quality of life. The almost similar findings were observed in the various studies conducted in Telangana, Qatar, Saudi Arabia and South Africa.\textsuperscript{11,14,15,17} Whereas the present study findings are contradictory to the study conducted in Nigeria which revealed that voiding dysfunction had severe impact on quality of life of perimenopausal women.\textsuperscript{13} As per findings of the present study, the impact was equitable over all domains measured for quality of life namely urinary symptoms (44.66%), general health (43.87%), sleep/energy (42.37%), coping measures (36.56%), role limitation (36.37%), emotions (36.16%), physical/social limitation (31.37%) and personal relationship (23.41%). These findings are almost consistent with the findings of the studies conducted in Madhya Pradesh and Saudi Arabia.\textsuperscript{12,15}

The findings of this study demonstrated that age, education, occupation, family income and type of delivery had significant relationship with quality of life among perimenopausal women with voiding dysfunction. These findings are consistent to the findings from Madhya Pradesh, India which revealed that the increasing age and low education status negatively affect the quality of life of perimenopausal women with voiding dysfunction.\textsuperscript{12}

**Conclusion**

Voiding dysfunction is a significant prevalent problem among the perimenopausal women, with a significant mild to moderate impact on their quality of life. Nurses are often the initial health care professionals, who can engage in identifying the cases, creating awareness campaigns to change perceptions, improve knowledge and empower women to seek early intervention to this problem in order to improve quality of life.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Ethical clearance was obtained from the Institutional Ethical Committee of Shri Guru Dass College of Nursing, Hoshiarpur, Punjab and written informed consent was obtained from perimenopausal women.

**References**

9. Tubaro A. Defining overactive bladder:


Association of Periodontal Disease, Obesity and Serum Cholesterol Levels: Is there a Link?

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¹Associate Professor, ²Oral Surgeon, AB Shetty Dental College, Mangalore, Karnataka State, India

Abstract

Background—Recent studies indicate that there is more than a causal relationship between serum lipid level, systemic health, and infectious oral disease like periodontitis. Periodontal disease is a destructive inflammatory disease inducing catabolic state characterized by altered lipid metabolism and hypertriglyceridemia.

Objective—The aim of present study was to investigate the association between periodontal status, cholesterol levels and Body Mass Index in normal and obese group.

Material & Method: A sample of 60 subjects; 30 subjects with normal BMI and 30 subjects with obese BMI with an age range of 30 to 65 years were included in the study. After clinical measurement of periodontium was done the serum samples of the both groups were drawn to estimate levels of High-density Lipoprotein, Low-density Lipoprotein, and Triglycerides.

Results—There was no statistically significant association observed in relation to Mean age, LDL and HDL cholesterols and TG in subjects with healthy periodontium and periodontitis (p>0.05). Our study did not find significant association between periodontal status, normal and obese body mass index.

Conclusions: In our study, we did not observe, significant association between the periodontal status, cholesterol levels and body mass Index in normal and obese group.

Key-words: periodontal disease, inflammation, obesity, cholesterol level.

Introduction

Periodontal disease refers to the inflammatory processes that occur in the tissues surrounding the teeth in response to bacterial accumulations, or dental plaque, on the teeth. The bacterial accumulations cause an inflammatory response from the body.¹ It is caused predominantly by gram-negative, anaerobic bacteria that induces local and systemic elevations of pro-inflammatory cytokines, such as tumour necrosis factor-alpha (TNF-α), interleukin -1β (IL-1β) and IL-6, this further leads to an increased mobilization of lipids from the liver and adipose tissue.²

The definition of obesity is based on the Body Mass Index (BMI) which is the ratio of body weight (in kg) to body height (in m) squared. BMI is highly correlated with fat mass and morbidity and mortality, and therefore sufficiently reflects obesity-related disease risk in a wide range of populations. Epidemiological studies have studied the association between obesity and periodontitis.³ One consequence of obesity might be increased risk for periodontal disease, although periodontal inflammation in turn may exaggerate the metabolic syndrome of which obesity is one component.⁴

Recent studies indicate that there is more than a causal relationship between serum lipid levels and systemic health (particularly cardiovascular disease, diabetes, tissue repair capacity and immune cell function), and periodontitis. In terms of potential relationship between periodontitis and systemic disease, it is possible that periodontitis-induced changes in
immune cell function, causes metabolic dysregulation of lipid metabolism through mechanisms involving proinflammatory cytokines.[5]

The high prevalence of both obesity and periodontal disease poses a substantial public health risk. Although obesity is becoming a worldwide problem, there is a small number of works devoted to this problem, especially about the relationship between obesity, cholesterol and periodontal disease. The aim of this study was to explore the association between obesity, serum cholesterol level and periodontal disease among adult population.

Materials and Method

A Cross-sectional case control study was conducted to investigate the association between periodontal status, cholesterol levels and body mass index in normal and obese group at AB Shetty Dental College, Mangalore, and Karnataka. A total of 60 subjects between age group of 30-65yrs, were randomly recruited from out patient’s attending the department of periodontics from May 2011 to 2012 and were classified into normal body mass index group and obese body mass index group based on body mass index, it was calculated using formula weight in kilograms divided by height in meter square (kg/m²).

Ethical clearance was obtained from the institutional ethics committee. All participants’ rights were protected and written informed consents were obtained before the procedures according to the Helsinki Declaration. Number and date of permission-Cert no:ABSM/EC/5/2011 Date-31-01-2011.

To ensure uniform interpretation, understanding and application by the examiner, codes and criteria for various conditions to be observed were recorded in the performa and the examiner were priorly calibrated and trained in the department. Study participants will be included if they have complete dentition, and are aged between 30-45 years, and are non-smokers and have no history of systemic disease or antibiotic therapy in the past 6 months. Study participants will be excluded if they are aged less than 30 years or aged above 65 years and are having systemic disease or have received oral prophylaxis or antibiotic therapy in the last 6 months. Study participants will be excluded if they had body mass index (BMI<18.5kg/m²).

A performa was used to record study subjects age, gender, height, weight, and periodontal status. The subjects BMI was calculated using formula weight in kilograms divided by height in meter square (kg/m²). The weight of each subject was measured to nearest 0.5 kg, using a portable analog weighing machine, manufactured by Edryl, India. The height was measured to nearest 0.5cm, using portable height measuring unit (floor model, manufactured by Narang scales Enterprises, Agra). The patients were divided into two groups according to their BMI (BMI) as normal (BMI<25.0 kg/m²) and obese BMI (30.0kg/m2 or more). [6]

Periodontal Examination and Assessment:

Periodontal disease was measured by single examiner, using William’s graduated periodontal probe, by measuring pocket depth and clinical attachment loss. Pocket depth was measured from gingival margin to base of the pocket. Clinical attachment loss was measured from the cement-enamel junction to the base of the pocket. Clinically, chronic periodontitis was defined as clinical attachment loss of ≥ 3mm and pocket depth ≥ 4mm in 30% of the total sites examined. [7]

Estimation of Cholesterol Levels: Two ml of blood sample was taken from each patient and sent to the Central Laboratory, Nitte University Research Centre, and was tested for low density cholesterol, high density cholesterol and Triglycerides using enzymatic analysis. All cholesterol determinations were made using the Total Serum Cholesterol Assay Reagent. High-density lipoprotein (HDL) cholesterol was measured by the precipitation procedure with DextraLip®50, (Genzyme Diagnostics). Triglycerides (TG) measured enzymatically with glycerol blanking using reagents from Miles-Technicon (Tarrytown, NY).Low-density lipoprotein cholesterol and triglyceride analyses were all performed on an Abbott Spectrum (Abbott Diagnostics, Irvine, TX) while direct LDL filtrates were analysed on a Cobas(Roche Diagnostics,Montclair,NJ).

The data obtained was subjected to statistical analysis with the consult of a statistician. Statistical analysis was done using Statistical Package of Social Science (SPSS 11.0; Chicago Inc., USA).The tests employed were Student’s t-test and Chi-square(X²). The level of significance was fixed at p<0.05.

The following study comprised of 60 patients they were divided into 2 groups of 30 patients each into normal BMI and obese BMI. The mean age of patients with normal BMI was 39.3±4.85 (mean ± SD) and the
The mean age of obese subjects was 46.6± 9.8 (mean ± SD) years.

There is a statistically significant difference in mean age as well as LDL cholesterol with subjects with normal and obese BMI with p values of 0.001 and 0.000, respectively. However, it was observed that there was no statistically significant association between HDL cholesterol, TG and BMI. [Table1]. The Mean age, LDL and HDL cholesterols and TG did not show any significant difference between healthy periodontium or periodontitis group p<0.05[Table 2]. There was no significant difference between the normal, obese BMI groups and healthy periodontium and periodontitis groups [Table 3].

Table 1 – Association between BMI (BMI) and high-density lipoprotein (HDL) and low-density lipoprotein (LDL) cholesterols and TG (TG) levels in both (Obese and Normal) study groups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal BMI Mean±SD</th>
<th>Obese BMI Mean±SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>39.27±4.85</td>
<td>46.60±9.82</td>
<td>0.001</td>
</tr>
<tr>
<td>HDL-c</td>
<td>44.30±8.40</td>
<td>47.27±8.64</td>
<td>0.182</td>
</tr>
<tr>
<td>LDL-c</td>
<td>65.29±21.63</td>
<td>74.77±20.76</td>
<td>0.000</td>
</tr>
<tr>
<td>TG</td>
<td>83.57±19.39</td>
<td>100.61±46.62</td>
<td>0.072</td>
</tr>
</tbody>
</table>

P<0.05, SD- Standard deviation; HDL-c - High-density Lipoprotein cholesterol; LDL-c - Low-density Lipoprotein cholesterol; TG-TG

There is a statistically significant difference between the mean age as well as LDL cholesterol in subjects with normal and obese BMI with p values of 0.001 and 0.000, respectively. However, it was observed that there was no statistically significant association between HDL cholesterol, TG and BMI.

Table 2 – Association between periodontal status and age, high-density lipoprotein cholesterol (HDL-c), low-density lipoprotein cholesterol (LDL-c) and TG (TG)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Periodontitis Mean±SD</th>
<th>Healthy periodontium Mean±SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>44.03±9.50</td>
<td>41.50±6.96</td>
<td>0.258</td>
</tr>
<tr>
<td>HDL-c</td>
<td>43.91±7.95</td>
<td>48.24±8.90</td>
<td>0.052</td>
</tr>
<tr>
<td>LDL-c</td>
<td>80.51±25.51</td>
<td>79.66±26.31</td>
<td>0.901</td>
</tr>
<tr>
<td>TG</td>
<td>93.66±35.92</td>
<td>90.04±37.69</td>
<td>0.707</td>
</tr>
</tbody>
</table>

Mean age, LDL and HDL cholesterols and TG did not show any significant difference between subjects with or without periodontitis p>0.05.

Table 3 Association between BMI (Body mass Index) and healthy periodontium and periodontitis.

<table>
<thead>
<tr>
<th>BMI</th>
<th>Healthy periodontium</th>
<th>periodontitis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>14</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>subjects</td>
<td>50%</td>
<td>47.1%</td>
<td>53.8%</td>
</tr>
<tr>
<td>Obese</td>
<td>12</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>subjects</td>
<td>46.2%</td>
<td>50%</td>
<td>52.9%</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>34</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Chi square value: 0.271, p value-0.016

There was no significant difference between the mean BMI and presence and absence of periodontitis [Table 3]
Discussion

Periodontal disease, caused mainly by bacteria, is characterized by inflammation and destruction of the attachment apparatus of the teeth and it affects large number of the adult population. Obesity is a systemic disease that predisposes to a variety of co-morbidities and complication that effect overall health. Recent studies have proposed several possible biological mechanisms that could mediate the association between BMI and periodontal infection. But it is still unclear whether being overweight or obese truly precedes periodontal disease.\cite{3-4}

The mean age of patients with normal BMI was 39.3±4.85 (mean ± SD) and the mean age of obese subjects was 46.6± 9.8 (mean ± SD) years it was statistically significant.

In our study there was significantly increased LDL cholesterol in obese BMI group compared to normal BMI group, however no association was found in relation to periodontal status. In our study, there were no smokers in all groups thus, smoking had smaller impact on the results. HDL is the compound containing both lipid and protein, which transport cholesterol to liver for excretion in the bile\cite{9-10}

In our study, the absolute values of HDL -cholesterol levels were low in patients with periodontitis but statistical insignificant. Present study showed that there was a difference in the mean values of low density cholesterol and TG between subjects with periodontitis and healthy periodontium, but it was not statistically significant. Previous studies demonstrated that there was a positive correlation between tooth loss and the levels of TG and LDL and a negative correlation between tooth loss and the levels of HDL and a positive correlation of blood pressure and the blood lipid index were significantly associated with the presence of periodontal pockets respectively. Patients with hyperlipidemia showed higher values of periodontal parameters compared to those with normolipidemic subjects.\cite{10-13}

Present study also showed that BMI was weakly associated with chronic periodontitis and the association was not statistically significant. Studies have suggested that there was no difference in clinical periodontal parameters, significant differences in inflammatory or metabolic parameters were found between overweight/obese and normal-weight patients in their systematic review.\cite{14} There was no casual relation between body weight and periodontal infection, and the association which is often observed, is due to number of shared risk factors. No association was observed between measures of obesity and periodontitis, although this study identified an association between number of episodes of obesity and risk factor for dental calculus, and number of teeth with gingivitis. The combination of these two conditions in obese subjects suggests these individuals may be at greater risk of chronic periodontitis.\cite{15}

The limitations of our study are small sample size and inability to account for confounding factors. Further longitudinal studies with larger sample size are needed to verify association between obesity and periodontal disease.

Conclusions

Our study concludes that no association was observed between serum cholesterol levels, Body mass Index and periodontal disease status.

Conflict of Interests Statement: The authors declare that there is no conflict of interests regarding the publication of this article.

Source of Funding: The authors thank Nitte University for the support in providing the grant for the study.

Ethical Considerations- Ethics Committee of AB Shetty dental college, Mangalore India. Number and date of permission-Cert no:ABSM/EC/5/2011 Date-31-01-2011

References


Assess the Awareness and Information Needs Regarding Normal Developmental Milestones of 1 to 3 Year Children among the Mothers of Infants, in a View to Prepare Information Booklet

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Abstract

Background: Developmental milestone are a set of functional skills or age specific tasks that most children can do at a certain age range. Child development mentions how a child becomes able to do more consisting of many different things as they grows older. Development is different than growth. Growth refers to the child’s development: Although each milestone has an age level, the actual age when a normally developing child reaches that milestone can vary quite a bit. Aims & Objectives: To assess the awareness and information needs regarding normal developmental milestones of 1 to 3 year children among the mothers of infants. And to find out the association between level of knowledge with selected socio demographic variables.

Material & Method: a community based descriptive study conducted among 200 samples on mothers of 1 to 3 year children by using simple random sampling technique through structured questionnaires. Inclusion criteria of study was mothers having first child. Result & Conclusion: study shows that there was 162(81%) Mothers of 8-12 month children’s having below average knowledge, and 38 (19%) were having above average knowledge regarding normal developmental milestones of 1-3 year Children’s. Study concluded that there was maximum mothers are having below average knowledge regarding normal developmental milestones of 1-3 year Children’s. So need to aware them or educate to mothers regarding normal developmental milestones of 1 to 3 year children.

Keywords—Normal developmental milestones, Mothers knowledge.

Introduction

“As your kids grow they may forget what you, but won’t forget how you made them feel.”

- Kevin Health

Developmental milestone are a set of functional skills or age specific tasks that most children can do at a certain age range. Child development mentions how a child becomes able to do more consisting of many different things as they grows older. Development is different than growth. Growth refers to the child’s development: Although each milestone has an age level, the actual age when a normally developing child reaches that milestone can vary quite a bit. Every child is unique (S. Neil). Over the past decade there has been a growing recognition of the involvement of the home in several public health and hygienic issues. Perhaps the best understood of these issues is the role of mother in preventing the delay in growth of infant Child development is one of the crucial issues of the twentieth century. Among the reasons for this interest is that child development affects the society at large. Consequently the manner in which the parents bring up their children has become the concern of the state and society. If the state does not make this concern, maladjusted children of today may become the anti-social elements of tomorrow.

More than 200 million children’s under 5years of age in developing countries do not reach their developmental potential. Children, especially infants and toddlers constitute the most disadvantaged group.
as far as psychosocial development is concerned. This is attributable to the greater vulnerability of developing brain in the early formatting years. Besides biological determinants, family environments of young children are major predictors of cognitive and socio emotional abilities. The present study is an attempt to assess the magnitude of global developmental delay among children less than 3 years of age and to analyze the impact of important biological ambient environmental factors on their psychosocial development.2

Review of Literature

The reviewed literature for the present study were organized under the following headings-

Section-I: - Review of Literatures Related to knowledge regarding selected aspects of growth and development among mothers.

Section-II: - Review of literatures related to problems identified during developmental period

A study done by Shivani Rikhy, Suzanne Tough et al in 2010 on parental knowledge of child development has been associated with more effective parenting strategies and better child outcomes, computer assisted telephone interviews were completed with 1443 randomly selected adults. Result shows that parents and females were better able to identify physical developmental milestones compared to non-parents and males. 81% of parents correctly responded that a child’s experience in the first year of life has an important impact on later school performance, 70% correctly responded that a child’s ability to learn is not set from birth, 50% of adults correctly responded that children learn more from hearing someone speak than from television, and 45% recognized that parents’ emotional closeness with a baby influences later achievement. Parents were most likely to use doctors/pediatricians, books, and nurses as resources. Among parents, there was no relationship between knowledge and parenting morale. Study concluded that the majority of adults were unable to correctly answer questions related to when children under six years of age typically achieve developmental milestones.3

Materials and Methodology

In this study the population was consists of 200 mothers of infants. Inclusion criteria was mothers of 8-12 month children, and exclusion criteria was mothers who are having more than one child. Sample size was calculated by using power analysis based on previous researches, quantitative research approach and descriptive research study design was used for the study. stratified sampling technique is used for differentiate the samples in strata’s & Then simple random sampling technique through lottery method was used for randomly selection of samples from selected strata’s among mothers of 8-12 month children. Based on study objectives self-structured questionnaire was used for the collection of data. The tool was divided into two sections. The first section contained demographic variable. The second section contained 28 multiple choice questions with four options for assessing the knowledge. Question was related on normal developmental milestones of 1-3 year children. The correct answer scored with one mark and incorrect answer zero mark and maximum score was 28. For the structured questionnaire test the grading of the score was formulated by investigator with the help
of statistician. The total was divided into two categories, 1-14 marks indicates below average knowledge and 15-28 marks indicates above average knowledge, Permission was obtained from the research committee of the Bharati Vidyapeeth Deemed to be University College of Nursing, Sangli, Pearson’s chi square test was obtained to find out association between the knowledge score and selected demographic variables.

Result and Discussion

Study shows that maximum 162 (81%) Mothers of 8-12 month children’s having below average knowledge, and 38 (19%) were having above average knowledge regarding normal developmental milestones of 1-3 year Children’s.

In age category maximum 60% mothers were from age group of 21 to 25 years. 34.5% belongs to the age group of 26 to 30 years and 5.5% from age group of 31 to 35 years. Educational Qualification:- It was found that 44% mothers are had secondary education, 39% are had primary education and 17% had higher secondary education. Type of family: - 65% mothers were belongs to the joint family and remaining 35% mothers are from nuclear family. Previous knowledge sources related to this study:- It was found that 89.5% mothers of infants was not having previous knowledge and 10.5% mothers was having previous knowledge regarding normal developmental milestones of 1-3 year children’s through, 5.5% mothers from books, 4% from TV, 0.5% from college and remaining 0.5% mothers through newspaper. The Pearson’s chi-square test was used to find out association between demographic variables knowledge. For the age Pearson’s Chi-square value is 1.073 and ‘p’ value is 0.585 which is more than 0.05 it shows there is no significant association between age of mothers with knowledge score. In education Chi-square value is 18.031 and ‘p’ value is 0.000 which is less than 0.05 it shows there is highly significant association between the education of mothers with knowledge score. In type of family Chi-square value is 7.61 and ‘p’ value is 0.006 which is less than 0.05 it shows there is highly significant association between type of family and knowledge score.

Conclusion

Maximum mothers was having not aware and less knowledge about the normal developmental milestones. They needs teaching or educate to improve their knowledge about normal developmental milestones of 1 to 3 year children

Conflict of Interest: Nil

Source of Funding: Self-Funding

Ethical Considerations: Ethical committee letter were submitted to the Bharati Vidyapeeth (to be Deemed) University, Pune

And obtained permission from university to conduct the research. Permission from concerned authority and parent of each sample were obtained before data collection.

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5. h t t p : / / d x . d o i . o r g / 1 0 . 1 5 9 0 / S 1 4 1 3 - 35552010000400007
Effect of Early Trunk Facilitation on Functional Mobility in Hemiplegic Individuals

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Abstract

Objectives: To find and compare the effect of conventional exercise and proprioceptive neuromuscular facilitation for early trunk facilitation on functional mobility in hemiplegic individuals.

Method: 30 subjects diagnosed with hemiplegia were included on the basis of inclusion and exclusion criteria in this study. These subjects were allocated in two groups by simple random sampling method. In the study pre and post treatment outcome assessment was taken on Barthel Index. Group A received conventional functional mobility exercises and trunk proprioceptive neuromuscular facilitation and Group B received only conventional functional mobility exercises for 4 weeks treatment protocol.

Results: 30 subjects participated in the study. Intra group comparison results showed statistically significant improvement in Barthel index score in both the groups (p <0.0001). Inter group comparison results showed Group A was statistically significant in showing improvement in Barthel Index score than Group B (p = 0.003).

Conclusion: Group A treated with conventional functional mobility exercises and trunk proprioceptive neuromuscular facilitation for early trunk facilitation showed significant improvement in functional mobility than Group B.

Keywords: Hemiplegia, Early trunk facilitation, conventional functional mobility exercises, proprioceptive neuromuscular facilitation, Barthel Index.

Introduction

Stroke is also termed as cerebrovascular accident. Stroke is defined as rapid onset of focal neurological deficit, resulting from diseases of the cerebral vasculature and its contents.

World Health Organisation defines stroke as a “rapidly developing clinical sign of local (at times global) disturbances of cerebral functions lasting more than 24 hr or leading to death with no apparent cause other than vascular origin”.

If the symptom resolves within the 24 hours of onset it is called as transient ischemic attack even though presenting with similar feature it is not considered as stroke.

It is the most common neurological disorder and the second commonest medical condition in the developed world that causes disability among adults.

Major risk factors are Hypertension, Heart disease and Diabetes. Stroke may be haemorrhagic or ischemic in nature. Embolism or thrombosis can lead to ischemic stroke.

Stroke leads to the long-term disability and leading preventable disability Which causes focal deficits including changes in the level of consciousness and impairments of sensory, motor, cognitive, perceptual and language functions.
Motor deficits are characterized by paralysis (hemiplegia) or weakness (hemiparesis) typically on the side of body opposite to the side of lesion.

Complete loss of voluntary movements in the arm and leg on one side is termed as Hemiplegia. It is characterized by altered muscle tone and tendon reflex, difficulty or inability to move upper and lower extremity.

After stroke functional performance gets impaired due to sensory and motor impairment of trunk. Bilateral impairment of the trunk muscles is present in patients with stroke.

Ability of trunk muscles that is trunk control is very essential as it allow the body to remain upright, adjust weight shifts, and performs selective movements of the trunk so it helps to maintain the centre of mass within the base of support during static and dynamic postural adjustments.

Trunk control is a fundamental component for performing All Daily Living activities. For balance and use of extremity during every day functional activities and higher-level tasks good trunk stability is essential. Thus, Trunk control is an early predictor of Functional outcome after stroke.

Most literature available which are focusing on the hemiplegic upper and lower limbs while the trunk receives little attention.

Dickstein et al. (2004) reported that the anticipatory activity of trunk muscles is impaired in stroke patients. Therefore, improving trunk stability is the major goal of rehabilitation in many stroke patients.

In physiotherapy a variety of movement therapy approaches are available for retraining motor skills in adult patients with hemiplegia.

**Functional Mobility:**

Functional mobility defined as person’s ability to move around in his or her environment. Examples include walking, scooting along a bed, and rising from a chair.

Getting up from a chair, walking up the stairs, or making yourself food are just a few examples of how functional mobility could be measured.

There are three main areas of functional mobility: 1) Bed mobility 2) Transfer 3) Ambulation

**PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF):**

PNF has been used for very long time for the functional improvement of stroke.

PNF is an approach to therapeutic exercise that combines functionally based diagonal pattern of movement with techniques of neuromuscular facilitation to evoke motor responses and improve neuromuscular control and function.

To improve the functional mobility in hemiplegic individuals. Early trunk facilitation is needed as an intervention in order to achieve early functional mobility.

As there is lack of literature on benefits of trunk facilitation to improve trunk mobility in hemiplegic subjects

The specific trunk control exercises should be studied as a therapeutic intervention so as to facilitate functional mobility.

Till date many neurophysiological techniques are available which mainly concentrates on reducing the limb spasticity and rehabilitation for better mobility of the limbs.

Despite the trunk performance is considered to be the important predictor for balance and functional performance, the evidence supporting the effectiveness of trunk rehabilitation is rare.

So, the present study conducted to rule out the effect of early trunk facilitation in gaining early functional mobility.

**Materials and Method**

**Participants**

30 subjects who diagnosed as Hemiplegia, based on inclusion and exclusion criteria were selected. Both male and female between age group 45-65 yr. willing to participate were included in the study. Written consent was taken. The criteria for inclusion were as follows: 1) Participants with stroke 2) Diagnosed as hemiplegia 3) Brunstrom stage 1. Exclusion criteria were as follow: 1) Participants with Any Other Neurological Condition, Musculoskeletal Conditions 2) Those Are Not Willing to
Participate in The Study. 3) Who Has Already Developed Synergy Pattern. functional mobility was recorded on Barthel Index pre-interventional and post interventional.

**Interventions**

30 subjects were divided into two group (n=15 in each group) by simple random sampling method. Group A were treated with conventional functional mobility exercises and trunk proprioceptive neuromuscular facilitation for early trunk facilitation to improve functional mobility and Group B were treated only with conventional functional mobility exercises for 4 weeks 5days/week. Pre and post treatment assessment were done with Barthel Index. Post treatment assessment was taken at 4 weeks.

**Conventional functional mobility exercises consisting of following exercise protocol**

**Positioning**

Passive RIMP (Reflex Inhibitory Movement Pattern) for Upper limb and Lower limb : 30 repetitions X 3 sets

**PELVIC BRIDGING:**

Lay on the exercise mat and place one leg flat on the floor with the knee bent. Place the other leg on an exercise ball. Using the core muscles, lift the pelvis off the mat and slowly lower back down. Repeat for 10 repetitions.

Functional mobility exercises included following  

1.**SUPINE-TO-SIDE LYING:**

subject lies in supine position. Therapist turn the subject neck towards affected side and cross the leg with unaffected leg over affected leg. Using posterior superior iliac spine (PSIS) as a key point therapist turned the subject towards the affected side and took the patient in side lying position.

2.**SIDE LYING- SITTING:**

Subject lies in side lying position on unaffected side then he asked to bear the weight on unaffected upper limb to get in sitting position at the edge of the plinth.

3.**SITTING-TO- STANDING:**

Subject was in sitting position with hip and knee in 90-90 degree and feet resting on the floor .one assistant was standing in front of the subject. subject’s hands were resting on the shoulder of the assistant. Therapist was standing behind the subject. Holding at the key point that is at PSIS subject was encourage to get in standing position.

**Trunk Proprioceptive Neuromuscular Facilitation:**

Protocol of three PNF technique were given to the subjects that is rhythmic initiation, slow reversal and agonistic reversal for pelvis for 45 minutes. For 5 days a week for total duration of 4 week. Each technique was given for 10 min

**Data Analysis**

**TABLE 1: AGE DISTRIBUTION**

<table>
<thead>
<tr>
<th></th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE IN YEAR</td>
<td>56.4</td>
<td>60.86</td>
</tr>
</tbody>
</table>

The statistical analysis shows that the mean age of subjects included in Group A was 56.4 year and that in group B was 60.86 years. According to unpaired t test as p value is 0.0558. the difference is considered as not quite significant.

**TABLE 2. GENDER DISTRIBUTION IN THE STUDY**

<table>
<thead>
<tr>
<th></th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>MALE</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

The table shows total no. of females in Group A was 4 and in Group B were 6 and total no. of men in Group A was 11 and in Group B were 9.

**TABLE 3: COMPARISON OF BARTHEL INDEX SCORE WITHIN GROUP**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-treatment</th>
<th>Post- treatment</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ±SD</td>
<td>Mean ±SD</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>10±6.81</td>
<td>35.66±8.83</td>
<td>p &lt;0.0001</td>
</tr>
<tr>
<td>B</td>
<td>6.66±6.17</td>
<td>25.33±7.18</td>
<td>p &lt;0.001</td>
</tr>
</tbody>
</table>
The pre-treatment values were 10+6.81 in group A and 6.66+6.17 in group B respectively, were as post interventional value for group A is 35.66+8.83 and group B is 25.33+7.188. Intra group changes in trunk control shows extremely significant functional mobility for both the groups. This was done by using paired ‘t’ test (Friedman test with post-test).

**TABLE 4: COMPARISON OF BARTHEL INDEX SCORE BETWEEN GROUP**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-treatment</th>
<th>Post- treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ( \pm SD )</td>
<td>Mean ( \pm SD )</td>
</tr>
<tr>
<td>A</td>
<td>10+6.81</td>
<td>35.66+8.83</td>
</tr>
<tr>
<td>B</td>
<td>6.66+6.17</td>
<td>25.33+7.188</td>
</tr>
<tr>
<td>U'</td>
<td>145</td>
<td>184</td>
</tr>
<tr>
<td>P</td>
<td>0.1753</td>
<td>0.003</td>
</tr>
</tbody>
</table>

The pre-treatment values were in group A 10+6.81 and 6.66+6.17 in group B respectively, were as post interventional value for group A is 35.66+8.83 and group B is 25.33+7.188. Inter group analysis for functional mobility between group A versus group B showed statistically very significant difference. This was done by using unpaired ‘t’ test. (Mann-Whitney test).

**Discussion**

The study, Effect of early trunk facilitation on functional mobility in hemiplegic individual was undertaken with the aim to evaluate the effect of early trunk facilitation on functional mobility in subjects with hemiplegia.

The objectives of the study, to determine the effect of trunk PNF with conventional functional mobility exercises and conventional functional mobility exercises alone for early trunk facilitation to improve the functional mobility in hemiplegic individuals.

The study was included 30 subjects diagnosed as hemiplegia of age group 45 to 65 years approaching to the outpatient physiotherapy department of Krishna hospital, karad. Depending upon the inclusion and exclusion criteria and those who were willing to participate were included in the study. In this study subjects were divided into two group, Group A and Group B. With simple random sampling technique (lottery method). Group A was treated with conventional functional mobility exercises and trunk proprioceptive neuromuscular facilitation and Group B was treated with conventional functional mobility exercise. Interventions were carried out for 4 weeks with 5 times per week.

Functional mobility of the individual is scored on Barthel index which is one of the best reliable and valid outcome measure.

This study shows significant difference in pre and post treatment values in both the groups. Group A which was treated with trunk proprioceptive neuromuscular facilitation with conventional trunk mobility exercises showed significant improvement in the outcome variables.

Statistical analysis was done by using ‘Paired t- test’ for within group comparison and ‘Unpaired t-test’ for between the group comparisons.

Target population or target age group for the stroke or cerebrovascular accident is the age 40 yr. and older. So, for this study age criteria were set in between 45 to 65. Mean for Group A was 56.4 and Group B was 60.86 which shows that there is no significant difference in mean age group of both the group.

Study showed that incidence of stroke is greater in men than women. In this study Group A has 11 male participant and group B has 9 male participants. Group A has 4 female participants and Group B has 6 female participants. which shows that there is poor gender distribution occurred which means males are more affected than female participants.

In the study pre-interventional values for Barthel index score were 10+6.81 and post interventional values for Barthel index were 35.66+8.83 in GROUP A.

p value is <0.0001 considered extremely significant.

In the study pre-interventional values for Barthel index score were 6.66+6.17 and post interventional value were 25.33+7.18 in GROUP B.

p value is 0.001 considered extremely significant.

In study pre-interventional values for Barthel index were 10+6.81 for group A and 6.66+6.17 for group B.

p value is 0.1753 considered not significant.

In the study post-interventional values for Barthel index were 35.66+8.83 for group A and 25.33+7.188 for
p value is 0.003 which is considered as extremely significant.

In the study for difference calculation statistical analysis was done with unpaired t test (mannwhitnty test) from which mean value for group A was 25.66 + 5.627 and mean value for group B was 18.33 + 6.455 respectively.

p value is 0.57 which is very significant in nature and u value for it is 179.50

The proprioceptive neuromuscular facilitation (PNF) technique is a method to improve the trunk stability of stroke patients. PNF stimulates proprioceptors within the muscles and tendons, thereby improving functions and increasing muscle strength, flexibility, and balance. The PNF approach utilizes a typical diagonal pattern to stimulate proprioceptive sensation. Improving proprioceptive sensation, and techniques of PNF help to normalize the tone of affected side trunk muscles, lengthening the contracted structures, relax the hypertonic muscles, initiating the movements, strengthening the weak muscles and improving the control of the pelvis, which helps to improve the trunk control.

Kumar et al (2012), in his study stated that specific PNF technique are very beneficial techniques for improving functional independence in patient with stroke especially in area like locomotion which is very important for functional mobility. Which correlates with this study.

The Group A where the subjects were treated with Trunk PNF and conventional functional mobility exercises showed extremely significant results in functional mobility improvement because, the subjects here received trunk PNF in addition and they also received the treatment benefitted with the same physiological effect as the other group.

**Result**

Based on the results of the present study it is concluded that both the Groups showed improvement in Barthel Index Score. Group A showed extremely significant result than Group B in improving functional mobility in hemiplegic individuals.

**Conclusion**

Results supported that conventional functional mobility exercises with trunk proprioceptive neuromuscular facilitation was more effective than only conventional functional mobility exercises for early trunk facilitation and in improving functional mobility in hemiplegic individuals.

**Conflict of Interest:** There were no conflicts of interest in this study

**Ethical Clearance:** Ethical clearance was taken from institutional committee of Krishna Institute of Medical Science, Deemed University, Karad.

**Source of Funding:** Source of funding is Krishna institute of medical sciences deemed University, Karad

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Comparative Study to Predict the Kidney Disease for the Clinical Data Using Classification Techniques

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Abstract

Data mining has proven to be very helpful and extremely effective. It has been used to uncover patterns from big stored information and then used that pattern to build or train classification models. Classification models are helpful to large clinical data for guidance and decision making. Through classification models, the disease can be classified, and also describes that disease is on which stage, from this patient receives better health care services. Kidney is one of the important organs of human body, it extracts waste creatinine and provides purified blood to other organs. Like that, a disease of another organ can also affect the kidney. Kidney disease can be caught by some tests but other diseases can also affect the kidney. This happens when medicinal services authorities utilize data mining projects to recognize and observe patients disease and plan the correct involvement required. So, the causes and effect of disease after period of time, from old data will be predicted using efficient classification techniques.

Keywords: Data Mining, Classification Models, Kidney Disease, Predicted, Medicinal Services

Introduction

Health care organizations are facing many new problems related to disease every day. Kidney disease is basically that condition in which kidneys will not work properly or we can say that the severe decrease of kidney function. Kidney disease can be tested by two major tests which are ¹³ Albumin-to-Creatinine Ratio (ACR) and Glomerular Filtration Rate (GFR).

So, kidney disease depends on the extract of creatinine, which is a waste material comes out from the filtration of blood, and it is removed from the body with urine. To diagnose the kidney disease urine test was preferred. Through urine test which checks for creatinine can describe the situation of the kidney that it will extract protein and filter the blood properly or not.

But what if another disease also affects the kidney²². So, this paper describes how other disease affects the kidney using data mining techniques. Cost of diagnosis of most diseases is heavy since many experiments are required to predict the disease. Selecting attributes which are really important for prediction of disease which can reduce this cost. Thus dimensionality reduction plays an important role in medical diagnosis. Some recent studies widely use feature selection techniques, and to extract some pattern data mining technique is used.

Data Mining

Data Mining is the process used to get useful information from the raw data or bulk of data by extracting of some pattern from the large datasets. Some basic steps for data mining process are Initially, collection of data which are stored in data warehouses is preprocess as well as analysis and get some pattern through which data is sort and finally, from this, the result is prepared.

The contribution of this article is to present a comprehensive study of comparing different classification techniques like naïve Bayes, SVM,
Random Forest to demonstrate techniques performance. With the help of kidney data, describe that how another disease can be affected to the kidney. Hence, a new guideline is prepared for future studies in prediction models.

**Literature Survey**

They shows some data mining technique respect to the Healthcare Organisation with their advantage and disadvantage. Many Techniques have their own limitation to deal with data like Neural Network is may able to deal with noisy data properly for training but in case of hundreds and thousands of input features or complex problem it gives poor performance where SVM is provided better performance and accurate performance compare to other but it limitation is that its fail when number of samples is less whether number of features is large, like that in Decision Tree is accepts and process all type of input but its limitation is its restricted to one output attribute. They concluded with that it is not possible to say that which technique is better than other because they have different advantage and disadvantage so, it is totally dependent on scenario or requirement.

Many predictive models are checked to use for Amyotrophic Lateral Sclerosis (ALS) disease progression and the probability of possibilities and come to that conclusion that SVM is somehow better than other. ALS is nervous system disease which impacts in physical functioning as well as muscles weakness and it is difficult to catch this disease in early stage because it takes 12 months (approximate) to complete its entire test but through data mining techniques it is easy to predict result on the basis of 3 months test.

The prediction model is prepared for diabetes checker and it checks that the person is in normal, Pre-diabetic, Diabetic condition by using éclat algorithm, if the patient had diabetes since many years then this algorithm calculates control and un-controlled condition of the diabetes disease.

Kidney disease or renal failure are discussed by the authors. The condition is described in which the patient faces the kidneys problem like not operate properly and uncertain activity. So, for prevention of kidney problem data mining techniques is used to predict kidney problem in early stages with low cost and in efficient time.

For feature subset selection algorithm is divided into two categories: Filter and Wrapper methods. In Filter methods learning algorithms is used but that algorithm is not necessary to give feedback. Whether in other method, learning algorithms are used but that algorithm gives feedback. That reduces not only the number of features

The author gave the overview of the feature extraction and feature selection, and with this, it also deals with outlier data. Before applying feature selection techniques, they preprocess data, then they apply PCA for feature extraction. For classifying the heart disease more accurate result, they use filter subset selection with wrapper filter.

The authors compare the two classification techniques i.e. Naïve Bayes and decision tree and check which technique is appropriate to classify the heart disease.

Machine learning is a collection of techniques and all have its own limitation so the authors trying to create ensemble framework using 3 famous techniques i.e. Neural Network, Least Square-Support Vector Machine and Naïve Bayes. So, the evidence-based clinical decision gets improved and Patients who give their time and money for treatment of heart disease will also get reduced.

Examine the clinical dataset. To do that they adopt a naive Bayes, K Nearest-Neighbor, SVM, C4.5 Decision tree. They set the upper bound for feature selection and for each time, they take 10-fold cross-validation and to finalize the result they calculate its average.

Alarm management for Chronic Kidney Disease(CKD) is discussed. They take some important value which is basically access or observe from the human body. If those values are not in the predefined size then there is may change of something wrong.

To diagnose Kidney Disease, they show that SVM is the best algorithm for detecting the kidney disease as well as the current information above blood circulation. Although risk factors for occurrence and progression of CKD have been identified, their utility for CKD risk stratification through prediction models remains unclear. They critically assessed risk models to predict CKD and its progression, and evaluated their suitability for clinical use.
Method

Data mining have a collection of many techniques. According to data, techniques have its own pros and cons. Some technique can be work with missing value like naïve Bayes but some cannot support missing value. So this play very important role, if medical data come into pictures. Let discuss, some important step which is taken to construct the perfect model.

Preprocessing

Before applying any technique, first of all, data is needed and the data must be in the stage where technique will give more accurate output. Dataset has been taken from kaggle. To remove noisy data, choose only that patient record for which creatinine is tested. Serum creatinine is tested for check the kidney’s filter capacity, and the normal range for healthy person is 0.8 to 1.3. and if serum creatinine is diagnosed in increased from the normal range, so it is treated as a bad condition of the kidney. That is why, treat the patient in risk stage if the serum creatinine is not in normal stage. So, for the further process, it will compare with other disease and check the patient situation.

Feature Selection

Feature selection is the process to identify the best attribute. In this, we choose only Serum creatinine, Diabetes Mellitus, Coronary Artery disease, Appetite Test, Pulmonary Embolism, Hypertension. Serum creatinine is a basic test for kidney and other columns indicate the other disease data.

In Table 1, Serum creatinine is a test for kidney disease and the other column is showing the other diseases detail of the same patient. Diabetes Mellitus column is showing that patient is suffering from diabetes, where Coronary Artery disease is related to heart disease, Pulmonary Embolism is related to lungs disease.

Classification Technique

The main objective is to predict the patient’s kidney test report, that he/she is in normal stage or in risk stage, even after checking how much kidney is affected by other diseases too, using data mining techniques. Data mining has a collection of techniques and each technique has its own limitations which makes it different from other techniques. After pre processing and feature selection, in the other step, the dataset is ready to apply the techniques. The supervised technique is used to classify this data because kidney disease is in generally two stages that is a normal stage or at risk stage. And because supervised technique is used, So, techniques need some labels through which it classifies the data. So, here it has two labels that are Normal and Risk. Now for kidney dataset, Serum creatinine is considered for labeling the data because it is the test through which kidney creatinine has been tested.

But all the other column is ordinal variable(i.e. suffering from a disease or not) and serum creatinine is a numerical value. Therefore, first convert numerical values into the ordinal values. So for that, set the limit to convert the numerical into ordinal variable and kidney is on risk stage only if serum creatinine is greater then 1.3. so, set 1.3 limits for converting the numerical into ordinal. Now, Dataset is ready to apply the supervised technique in this data. So, In this paper, data are classified by naïve Bayes, SVM, Random Forest.

Naïve Bayes is basically probability-based classification. It follows the Bayes theorem to classify the data. It is supervised technique and also uses the label to classify the data. Naïve Bayes is one of the famous algorithms because it compares one attribute to another attribute separately and applies Bayes theorem to classify that. So, In this, the ordinal value of serum creatinine is compared to other attributes and then classifies that the patient is having a kidney problem or not.
Using Naïve Bayes classification, Class which contain the label for classification (i.e. Normal and Risk) is comparing with other and apply Bayes theorem separately for all present number of class is available (for this case Bayes theorem applied for both normal and risk stage) and last finally, it will classify that patient is in normal or risk stage.

Support Vector Machine is a classification and regression prediction tool and it is also supervised technique, it is famous for its automatic deal with over-fit data. SVM classifies the data using vector and regression line. Vector and regression process is executing again and again until it gives fewer errors and also creates margin line closest point with each side so from that algorithm get help to classify the problem.

For the constraints:

\[ y_i (\mathbf{w}^T f(x_i) + b), \]

where \( C \) is the capacity constant, \( \mathbf{w} \) is the vector of coefficients, \( b \) is a constant, and \( E_i \) represents inputs. The index \( i \) labels the \( N \) training cases. Note that \( y \in \pm 1 \) represents the class labels and \( x \) represents the independent variables. The kernel \( f(x_i) \) is utilized to change information from the contribution to the feature space. It ought to be noticed that the bigger the \( C \), the more the mistake is punished. Hence, \( C \) ought to be chosen with care to abstain from overfitting.

Random Forest is classification and regression model which builds many decision trees, through those trees, the model will predict the result. It gives first priority to the attribute which is having greatest Mean Gini value. For kidney disease dataset, Random Forest works with 500 trees.

It works in following steps

Random Forest as per its name implies random, It takes random rows from the dataset and creates a separate subset of them.

For each subset, it follows the decision tree concept (i.e. Calculates gain, entropy, etc. According to gain index, it set each node). So, each subset has its own decision tree.

Same input provides to every decision tree and takes output as a vote, the maximum vote treated as main classified output.

**Results and Discussion**

So, in this paper, The dataset size in which above techniques are applied is 400 rows and 25 columns. From that, to train the model 70% of rows has been taken, and the rest rows are taken to test the model. Figure 1 shows the accuracy rate of all above classification techniques.

![Figure 1: Accuracy](chart.png)

Here, the accuracy for Naïve Bayes and SVM are same although their true positive and false positive are different because both the techniques are different in some aspects which are comparing the attributes as well as labeling resulted in data.

The highest accuracy is obtained as 92.96% using Random Forest, because it creates all possible decision tree. So at the time of checking the new data, it compares with an existing trees to label the result.

**Conclusion**

In this paper, Classification techniques are used to classify whether the patient’s kidney is in normal stage or in risk stage. Along with that it also checks how much it is affected by the other diseases. To prepare a better model, firstly it should be trained. But for some techniques, data must be in acceptance stage (i.e. Removing noisy data, dealing with missing values, etc.) and for that, preprocessing and feature selection are used. For dealing with noisy data, select only that patient’s detail whose Kidney (or creatinine) test has been conducted and for feature selection, select the relevant column like serum creatinine which is specifically a kidney test and other diseases result column. This study compares the...
techniques and trains them separately. Each technique has its separate functionality and accuracy, but from the experiment and result, it is clear that random forest is the best for kidney dataset because it has better accuracy rate.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**Ethical Clearance:** Data has been taken from the open source dataset. Patients identity is not available.

**References**


Evaluating the Effects of Neck Exercise on Post Thyroidectomy Patients- A Pilot Study

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Abstract

Background: The most vital hormone gland is the thyroid gland and it has an important role in the human growth and development. Thyroidectomy ends with discomfort symptoms in patients for their rest of their life, they try to live their life with discomfort in their neck Objective: To evaluate the efficacy and safety of neck exercises to reduce post-thyroidectomy symptoms for patients undergoing thyroid surgery Methodology: Convenient sampling has been employed to select the patients who underwent thyroidectomy. After getting informed consent signed, a total of 5 volunteer patients who experienced a total thyroidectomy and were older than 50 years participated in the study. On the Post operative day 1, the stretching exercises were instructed Discussion: Thyroidectomy is the commonly performed procedures worldwide and it represents the principal treatment modality for thyroid diseases. Complications following thyroid surgery are rare but their effects can persist as life -threatening. The majority of the studied patients were females which show that thyroid disorders were present among females more than males Conclusion: Education and neck stretching exercises significantly improved the neck condition of patients in pain and disability of the neck.

Keywords: Thyroidectomy, Neck Exercises, Rehabilitation

Introduction

The most vital hormone gland is the thyroid gland and it has an important role in the human growth and development. It helps to regulate many body functions. Total thyroidectomy is the most common surgical management preferred in patients with Cancer and thyroid operations were predominant if the patients diagnosed with goiter and hyperthyroidism. The most important and feared complications following thyroidectomy is recurrent laryngeal nerve palsy. Thyroidectomy ends with discomfort symptoms in patients for their rest of their life, they try to live their life with discomfort in their neck. These patients frequently reports discomfort in their neck such as pain, stress in the neck, stiffness around the shoulder and restriction in shoulder and neck range of motion difficulties.

Discomfort exists in all the patients with post thyroidectomy incisions is because of the hyper extended position adapted by the patient during the surgical procedure. This current pilot study examined the patients during the early postoperative period, patients were examined initially the neck ROM and the position of neck adapted by the patient is examined in detail.

In early postoperative period, patients were observed and instructed in Post Operative Day 0 to not to keep their neck hyper-extended and they have been advised to walk in and around the ward. During the initial observation all these patients adapted a static posture with the fear of moving the limbs and mobilizing themselves in the bed. After mobilization, a poor posture has been simultaneously adapted by the patients because of discomfort and fear of pain around the neck.

This neck discomfort has perfect correlation with the activity of daily living in patients underwent thyroidectomy. In hospital clinical practice, the need for physiotherapy management in patients underwent total

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thyroidectomy has not paid much attention and focus, because of the poor referral rate for physiotherapy rehabilitation. Lack of referral rate is because of the poor knowledge in physiotherapy management protocol in the rehabilitation of patients undergoing thyroidectomy. Neck movements are recommended to avoid negative experiences following thyroidectomy. These basic neck stretching exercises will improve pain perception in patients by improving neuromuscular coordination, muscle weakness can be prevented.

Objective

To evaluate the efficacy and safety of neck exercises to reduce post-thyroidectomy symptoms for patients undergoing thyroid surgery

Need for the study

According to SRM MEICAL HOSPITAL AND RESEARCH INSTITUTE, CHENNAI, Hospital records from (2017 to 2018) incidence of thyroidectomy operations have been drastically increased. However, most of the patients complain of neck pain and disability. This has been observed during daily clinical practice, but the patients were not having adequate knowledge about neck exercise and the advantages of practicing this exercise to reduce the neck pain and disability. They have been educated and referred for physiotherapy treatment sessions. So this study is considered the first in this group of patients to increasing their knowledge and practice in an attempt to decrease the incidence of this complication.

Methodology

Convenient sampling has been employed to select the patients who underwent thyroidectomy. After getting informed consent signed, a total of 5 volunteer patients who experienced a total thyroidectomy and were older than 50 years participated in the study. The patients were examined for cognitive deficit and any other neuromuscular disorder. Patients with hearing impairment and mental problem that interfered with communication and patients with neck dissection, neck drain during thyroidectomy and those who experienced neck pain before the operation have been excluded out of the study. The study included patients who underwent total thyroidectomy. Baseline assessments were done by the therapist on neck pain and disability. Subjects were educated about the neck rehabilitation exercises and they have been assigned into stretching exercise. On the Post operative day 1, the stretching exercises were instructed and it consist of eight steps

**TABLE 1: NECK EXERCISE PROTOCOL**

<table>
<thead>
<tr>
<th>STEPS</th>
<th>EXERCISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relaxation exercise to shoulders and neck</td>
</tr>
<tr>
<td>2</td>
<td>Neck flexion exercise – by look down</td>
</tr>
<tr>
<td>3</td>
<td>turn face to the right</td>
</tr>
<tr>
<td>4</td>
<td>turn face to the left</td>
</tr>
<tr>
<td>5</td>
<td>incline head to the right</td>
</tr>
<tr>
<td>6</td>
<td>incline head to the left</td>
</tr>
<tr>
<td>7</td>
<td>Shoulder shrugging exercise</td>
</tr>
<tr>
<td>8</td>
<td>Chest expansion exercise</td>
</tr>
</tbody>
</table>

Previous researchers have highlighted the importance of stretching exercises following several types of thyroid surgeries and its efficient ways to reduce pain, improve quality of life. There is a hypothesis that neck stretching exercise on post operative day 1 will have a negative effect on incision healing, hence the study has been done to prove the added benefits of neck exercise in patients with total thyroidectomy. Neck pain leads to psychological difficulties in patients’ activity of daily living. Patients were asked to perform five replicates of all the neck exercise, three times per day (morning, afternoon, and evening) for 1 week. All the treatment session was monitored and the patients were given feedback of how they performed the stretching exercises. At the end of the one week treatment session they have been given an exercise pamphlet and advised with home exercise programme. Their neck pain and disability as well as healing of the wound was checked and assessed with Neck pain and disability index questionnaire. NDI has ten items that measures pain intensity, personal care, lifting, reading, headaches, concentration, work, driving, sleeping, and recreation. Scoring for neck pain and disability index questionnaire was calculated by considering the 10 items, each with a score up to 5, for a total score of 50. Grading of neck pain and disability index questionnaire was No disability (0-4), Mild disability (5-14), Moderate disability (15-24), Severe disability (25-34), and Complete disability equals 35 and above.
Figure 1: Hyperextended neck – a poor posture adapted in patients with total thyroidectomy

Figure 2: Neck exercises instructed by the examiner

Table 2: Baseline recording of neck pain and disability index

<table>
<thead>
<tr>
<th>S.no</th>
<th>Variables</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Disability</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Mild Disability</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Moderate Disability</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Severe Disability</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Completely Disabled</td>
<td>4</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Recording of neck pain and disability index at the end of 1 week of neck exercise session

<table>
<thead>
<tr>
<th>S.no</th>
<th>Variables</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Disability</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Mild Disability</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Moderate Disability</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Severe Disability</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Completely Disabled</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5</td>
<td>80</td>
</tr>
</tbody>
</table>

Discussion

Thyroidectomy is the commonly performed procedures worldwide and it represents the principal treatment modality for thyroid diseases. Complication rates dependent on preoperative and post operative physiotherapy rehabilitation programme. Complications following thyroid surgery are rare but their effects can persist as life-threatening. The majority of the studied patients were females which show that thyroid disorders were present among females more than males. All the patients included in the study were a known case of diabetes and hypertension. This finding was congruent with Al-Gaffer who mentioned that diabetic patients have susceptibility to different types of thyroid dysfunction. By this pilot study it has been evident that patients show...
a reduction in neck pain and disability after 1 week of exercise intervention.

**Conclusion**

Education and neck stretching exercises significantly improved the neck condition of patients in pain and disability of the neck.

**Recommendations**

Future research is needed in patients with larger samples grouping and by developing a new treatment and follow-up protocol and to use the validated neck pain and disability questionnaire in monitoring patient’s condition.

**Ethical Clearance:** Obtained from the Department.

**Funding:** Nil

**Conflict of Interest:** Nil

**References**


Duel Burden of Underweight and Overweight among Likely to Conceive Women of Rural North Karnataka: Prevalence and Its Social-Demographic Determinants-Baseline Result of DBW Cohort Study

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Abstract

Background: The duel burden of malnutrition is characterized by the coexistence of under-nutrition along with overweight, obesity or diet-related NCDs, within individuals, households and populations, and across the life-course. Hence a study carried out to identify the prevalence of underweight and overweight among likely to conceive women and its determinants.

Method: Determinants of Birth Weight (DBW): a community based prospective cohort study at rural North Karnataka collected information from 1293 likely to conceive women on pretested interview schedule. Nutrition status of women was graded based on WHO international BMI categories. Chi Square test and multinomial logistic regression were applied to identify the determinants of underweight and overweight with the 95% confidence interval with P values less than 0.05.

Result: The prevalence of underweight, normal weight, overweight and obesity was found 35.1%, 52.4%, 9.7% and 2.7% respectively with mean±SD BMI 20.4 kg/m²±3.876 kg/m². The determinants of duel burden of underweight and overweight found in the study were current age of women, age at menarche, family type and education level of women and p value less than 0.05.

Conclusion: Younger age group women, women from joint family and women with lower education level are more likely to suffer from both underweight and overweight in North Karnataka.

Keywords: Body Mass Index; duel burden BMI; determinants, likely to conceive women, North Karnataka

Introduction

Background and Research Problem

The duel burden of malnutrition is characterized by the coexistence of under-nutrition along with overweight, obesity or diet-related NCDs, within individuals, households and populations, and across the life-course.¹ Today nearly one in three persons globally suffer from at least one form of malnutrition: wasting, stunting, vitamin and mineral deficiency, overweight or obesity and diet-related NCDs. In 2014, approximately 462 million adults worldwide were underweight, while 1.9 billion were either overweight or obese.¹

The ‘dual burden’ of health concern caused through both underweight and overweight is significantly important for public health policy in developing nations to address.² The problem relating to malnutrition for both men and women should receive equal attention. However, concerns relating to women in developing countries deserve extra attention because of cultural and economic backdrops among women. Secondly, maternal malnutrition directly affects the pregnancy outcome and

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An augmented numbers of literatures assert that an increased BMI of women is independently associated with increasing risk of adverse obstetric and neonatal outcome. Women with a low BMI is often associated with low nutritional status and adverse health outcomes, such as low birthweight, preterm birth, mental health impairment, increased risk of early mortality, and higher risk of infant mortality. Beside, overweight are at a greater risk of gestational diabetes and larger birth weights in their offspring, putting their infants at higher risk from overweight and obesity later in life; in addition, accelerated weight gain in early life is associated with higher body mass index and obesity later in life. However, it also lead to increased risk for hypertension, and preeclampsia in pregnancy, caesarean and instrumental deliveries, hemorrhage, infection and maternal mortality during labor. Thus, our objective is to assess the prevalence and determinants of underweight and overweight including obesity among likely to conceive married women in rural North Karnataka.

Materials and Method

Study design and participants. Baseline data of Determinants of Birth Weight (DBW): a community based prospective cohort study at rural area of North Karnataka was analyzed. All Likely to Conceive Women (LTCW) were invited to participate in the screening based on the eligible criteria: 15-45 years of married women residing since last one year in study area; not using any family planning method; and last delivery was before 6 month at the time of screening. In DBW cohort study, 1293 LTC women age 14-45 years were selected using proportional allocation sampling technique from 3 PHC covered area in rural North Karnataka. The currently pregnant women and women suffering from sterility problem were excluded from the study.

Outcome measure:

Women’s weight status, indicated by their BMI category, was used as the outcome variable in the analyses. The well-trained field staff measured bodysize of women during at-home. Weight was measured using an electronic scale with a precision of 0.1 kg, and height with a wall mounted height measuring scale, which can provide accurate measurements to the nearest 0.1 cm. The WHO International BMI cutoff points was used to grade the nutrition status of women as <18.5 kg/m² as underweight, 18.5 to 24.99 kg/m² as normal weight, 25 to 29.9 kg/m² as overweight and ≥30 kg/m² as obesity.

Exposure variables

The study considers demographic, socioeconomic and dietary factors to assess the nutritional status of likely to conceive women. The effect of one variable on malnutrition is likely to be confounded with the effects of other variables. Therefore, demographic, socioeconomic and dietary characteristics were controlled statistically. The variables included as covariates are: women’s current age at interview, age at menarche, age at first pregnancy, family type, birthweight of women, women religion, caste, mother tongue of women, women’s education level, work for pay status and vegetarian or non-vegetarian as dietary factor.

Analysis

Data was entered in Ms. Excel sheet and transferred to SPSS ver. 20 for analysis. LTC women were categorized based on World Health Organization International cutoff points. Simple analysis like percentage, mean, standard deviation and range of different variable was calculated. Chi-square and multinomial logistic regression analysis were applied with 95% confidence interval (CI) and p value less than 0.05.

Ethical Consideration: Ethical approval was taken from institutional review board of KLE University before conducting the study. Written informed consent was taken from all participants before interview and measurement of body height and weight.

Result

Characteristic of Participants: Socio-demographic:

Out of 1293 participants, almost half (49.7%) LTC women were 20-24 years of age group where as 26.3% from 25-29 years of age group, 13.5% from 15-19 years of age group and only 10.6% women were 30 or more years of age. The mean±SD ages of participants were 23.7±4.3 years with minimum and maximum age 15 and 44 years respectively. Among those 67.1% women menarche had occurred on 10-14 years of their age and in remaining 32.9% menarche had occurred on 15-21 years of age. The mean±SD age at menarche was 13.9±1.5 years with minimum 10 years and maximum 21 years of age. More than quarter (32%) participants
married before 18 years of her age. Among the surveyed women, mean±SD age at marriage was 18.8±3.1 years and minimum and maximum were 5 years to 32 years of age respectively. 9.8% participant become pregnant before completion of her 18 years of age and 20.8% participants were nulligravida. The mean±SD age at first pregnancy was 20.5±3.1 years and minimum age was 13 years and maximum was 37 years of age. Majority (74.9%) of women belong to joint family and only 25.1% from nuclear family. In the study, women were asked to recall her birthweight and 14.6% women told that they were normal, 6.8% reported they were small and 4.7% told they were big. Whereas, 73.9% women told they don’t know their birthweight.

**Socio-economic:**

Among the study participants, 89.9% LTC women belonged to Hindu religion, 9% belonged to Muslim communities and 1.1% was from other religions. Majority (63.6%) participants were from general caste, 17.9% from ST, 12.8% from OBC and 5.7% from SC communities. By their mother tongue 43.3% were from Kannada, 46.6% Marathi, 9% Urdu and 1.2% other languages. Among the participant, 12.1% women were illiterate where as 7.6% had completed her graduate or more, 66% women had completed her secondary education and 14.3% had completed primary education. Likewise, 4.1% women work for pay and remaining 95.9% women work not for pay.

**Dietary:**

Majority (82%) LTC women were non-vegetarian whereas 18% women were pure vegetarian on her diet.

**Prevalence of Underweight, overweight and obesity among LTC women**

The distribution of likely to conceive women across categories of BMI showed that, 35.1% women were underweight, 52.4% were normal weight, 9.7% were overweight and 2.7% were obese (Fig.1). Mean±SD BMI observed was 20.4 kg/m²±3.876 kg/m² whereas minimum and maximum BMI were 13.2 kg/m² and 44.9 kg/m² respectively.

![Figure No.1: Nutrition Status of LTC women base on BMI WHO International Classification (n=1293)](image)

**BMI and socio-demographic factors**

The associated p values in chi-square analysis suggested significant difference (p<0.05) in three categories of BMI by different groups of exposure variableslike current age, age at menarche, age at marriage, age at first pregnancy, family type, caste, mother tongue, women’s education level and work for pay but not significant with birthweight of women, religion, and vegetarian or non-vegetarian diet (Table 1).
### Table 1. Distribution of LTC women across categories of BMI by different predictors

<table>
<thead>
<tr>
<th>Background characteristics</th>
<th>BMI (kg/m²) category</th>
<th>( \chi^2 )</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;18.5</td>
<td>18.5-24.9</td>
<td>≥25</td>
</tr>
<tr>
<td>Current age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>78 (44.8%)</td>
<td>6 (3.4%)</td>
<td>90 (51.7%)</td>
</tr>
<tr>
<td>20-24</td>
<td>248 (38.6%)</td>
<td>45 (7%)</td>
<td>349 (54.4%)</td>
</tr>
<tr>
<td>25-29</td>
<td>98 (28.8%)</td>
<td>68 (20%)</td>
<td>174 (51.2%)</td>
</tr>
<tr>
<td>≥30</td>
<td>34 (24.8%)</td>
<td>42 (30.7%)</td>
<td>61 (44.5%)</td>
</tr>
<tr>
<td>Age at Menarche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-14</td>
<td>287 (33.1%)</td>
<td>123 (14.2%)</td>
<td>457 (52.7%)</td>
</tr>
<tr>
<td>15-19</td>
<td>171 (40.1%)</td>
<td>38 (8.9%)</td>
<td>217 (50.9%)</td>
</tr>
<tr>
<td>Age at Marriage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18</td>
<td>163 (39.4%)</td>
<td>37 (8.9%)</td>
<td>214 (51.7%)</td>
</tr>
<tr>
<td>≥18</td>
<td>295 (33.6%)</td>
<td>124 (14.1%)</td>
<td>460 (52.3%)</td>
</tr>
<tr>
<td>Age at first Pregnancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Pregnant</td>
<td>98 (36.4%)</td>
<td>21 (7.8%)</td>
<td>150 (55.8%)</td>
</tr>
<tr>
<td>&lt;18</td>
<td>60 (47.2%)</td>
<td>10 (7.9%)</td>
<td>57 (44.9%)</td>
</tr>
<tr>
<td>≥18</td>
<td>300 (33.4%)</td>
<td>130 (14.5%)</td>
<td>467 (52.1%)</td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>106 (32.7%)</td>
<td>69 (21.3%)</td>
<td>175 (46.0%)</td>
</tr>
<tr>
<td>Joint</td>
<td>352 (36.3%)</td>
<td>92 (9.5%)</td>
<td>457 (54.2%)</td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>263 (32.0%)</td>
<td>117 (14.2%)</td>
<td>442 (53.8%)</td>
</tr>
<tr>
<td>OBC</td>
<td>60 (36.4%)</td>
<td>20 (12.1%)</td>
<td>85 (51.5%)</td>
</tr>
<tr>
<td>SC/ST</td>
<td>135 (44.1%)</td>
<td>24 (7.8%)</td>
<td>147 (48.0%)</td>
</tr>
<tr>
<td>Mother tongue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kannada</td>
<td>227 (40.5%)</td>
<td>58 (10.4%)</td>
<td>275 (49.1%)</td>
</tr>
<tr>
<td>Marathi</td>
<td>187 (31.3%)</td>
<td>83 (13.9%)</td>
<td>328 (54.8%)</td>
</tr>
<tr>
<td>Others</td>
<td>44 (32.6%)</td>
<td>20 (14.8%)</td>
<td>74 (52.6%)</td>
</tr>
<tr>
<td>Women’s education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tertiary (≥ UG)</td>
<td>21 (21.4%)</td>
<td>26 (26.5%)</td>
<td>51 (52.0%)</td>
</tr>
<tr>
<td>Secondary (9-12)</td>
<td>291 (34.1%)</td>
<td>105 (12.3%)</td>
<td>458 (53.6%)</td>
</tr>
<tr>
<td>Primary (1-8)</td>
<td>67 (36.2%)</td>
<td>20 (10.8%)</td>
<td>98 (53.0%)</td>
</tr>
<tr>
<td>No Education</td>
<td>79 (50.6%)</td>
<td>10 (6.4%)</td>
<td>67 (42.9%)</td>
</tr>
<tr>
<td>Currently Work for Pay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14 (26.4%)</td>
<td>12 (22.6%)</td>
<td>27 (50.9%)</td>
</tr>
<tr>
<td>No</td>
<td>444 (35.8%)</td>
<td>149 (12%)</td>
<td>647 (52.2%)</td>
</tr>
</tbody>
</table>

Determinants of underweight and overweight
Statistically significant variables on chi-square test were further taken for multinominal logistic regression to assess their net effect on outcome measure (Table 2). Compared to the elder, the younger were more likely to be underweight and overweight. Interestingly, the risk of underweight and overweight among women whose menarche occurred during 10-14 years has 63% and 46% lower as compared to menarche occurred during 15-19 years of age respectively. Nuclear family has 2.17 and 2.22 lower odds of having underweight and overweight respectively as compared with women belong to joint family which is statistically significant at p value less than 0.001. Likewise, this study reveal that women who pursued higher education level has the significantly lower risk for being underweight and overweight as compared with no education women which is statistically significant. In multinominal logistic regression age at marriage, age at first pregnancy, caste of women, women’s mother tongue and work for pay were statistically not significant though they were significantly associated with underweight and overweight on chi-square test.

**Table 2. Adjusted odds ratios (95% CI) for the study variables and covariates from multinomial logistic model predicting underweight and overweight among LTCW**

<table>
<thead>
<tr>
<th>Background characteristics</th>
<th>BMI (kg/m²) category</th>
<th>Underweight vs Normal OR (CI)</th>
<th>Overweight vs Normal OR (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current age (completed years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>12.18 (4.22-35.12)</td>
<td>7.51 (2.72-20.76)</td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>5.58 (3.06-10.18)</td>
<td>4.41 (2.57-7.57)</td>
<td></td>
</tr>
<tr>
<td>25-29</td>
<td>1.58 (0.89-2.80)</td>
<td>1.62 (0.98-2.68)</td>
<td></td>
</tr>
<tr>
<td>≥ 30</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Age at Menarche (completed years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-14</td>
<td>0.37 (0.23-0.57)</td>
<td>0.54 (0.35-0.83)</td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>0.46 (0.30-0.70)</td>
<td>0.45 (0.30-0.66)</td>
<td></td>
</tr>
<tr>
<td>Joint</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Women’s education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tertiary (≥ UG)</td>
<td>0.14 (0.05-0.37)</td>
<td>0.32 (0.12-0.80)</td>
<td></td>
</tr>
<tr>
<td>Secondary (9-12)</td>
<td>0.31 (0.14-0.68)</td>
<td>0.52 (0.23-1.14)</td>
<td></td>
</tr>
<tr>
<td>Primary (1-8)</td>
<td>0.43 (0.18-1.05)</td>
<td>0.69 (0.29-1.66)</td>
<td></td>
</tr>
<tr>
<td>No Education</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>

†p<0.001; ‡p<0.01; †p<0.05; ‡p<0.10

**Discussion**

The present study assesses the nutrition status of likely to conceive women in North Karnataka and its socio-demographic determinants. Nutrition status was measured using WHO BMI international cut off point. The finding documents the co-existence of duel burden of under nutrition and overweight among likely to conceive women in rural North Karnataka. Finding shows that, prevalence of underweight, normal weight and overweight was 35.1%, 52.4% and 12.4% (overweight 9.7% and obesity 2.7%) respectively. The prevalence of underweight and overweight is lower as compared with NFHS-4 survey result. The reason might
be the geographical region and urbanization. The lower prevalence might be this study was carried out in rural area of North Karnataka only.

Our study reveal that socio-demographic determinants like younger women, women with late menarche, women from joint family and low education level significantly greater risk of being underweight and overweight among likely to conceive women of rural north Karnataka. The increase likelihood of being underweight among the younger women, compared to their elder counterparts, and decrease risk of underweight among women who were belong to nuclear family may be partly attributed to physical activities, cultural norms, and food practicing. Biological phenomena are also concerned with underweight of young women compared to their elders. In our study not only underweight is common in younger women but also overweight as well which is different than other studies. The reason may be the younger age group is more prone to risk of malnutrition as compared with their counterpart due change in generation.

In present study also reveal that those women who experienced her menarche after crossing 14 years of age are more prone to develop underweight and overweight later in her life as compared to those experiences her menarche at 11 to 14 years of her age. Finding reveals a strong significant relation between BMI and women’s level of education. The higher the level of education, the lower was the risk of being underweight as well as overweight.

Though the relationship between education and overweight is not so robust,having more years of education reduces the prevalence of underweight among likely to conceive women in rural north Karnataka. Thought number of studies, there was a positive relationship between education and obesity.\(^5,9,10\) However, some studies from industrial countries and in a few developing countries demonstrated that the burden of obesity is shifting toward low-educated which is similar with our study result.\(^5,11,12\) A cross-sectional estimates from a study of twins conducted by Webbink et al. (2008), also confirms the negative relationship between education and the probability of being overweight. Yoon et al. (2006) also found that higher levels of education for women resulted in lower BMI.\(^13\)

**Conclusion**

India is facing double burden of underweight and overweight. The finding suggest that malnutrition among likely to conceive women in north Karnataka is determined by many socio-demographic factors like age of women, age at menarche, education level of women and the family type she belonged to. The duel existence of underweight and overweight among likely to conceive women in North Karnataka must be taken in consideration so that public health intervention may be adopted through appropriate policy hence to reduce the risk of women developing different types of non communicable diseases as well increase the chance of healthy pregnancy outcome.

**Conflict of Interest:** Authors declare no conflicts

**Fund:** KLE University provided scholarship to carry out the DBW cohort study as PhD dissertation

**References**

6. WHO. Double-duty actions for nutrition Policy Brief. Department of Nutrition for Health and


Comparison of Quality of Life among Oral and General Cancer Patients

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¹Graduate Student, ²Reader, Department of Oral Medicine and Radiology, Saveetha Dental College

Abstract

Background: Cancer is a disease involving abnormal proliferation of cells and potential to invade to other parts of the body. The different types of cancer based on sites are oral cancer, breast cancer, lung cancer, prostate cancer, cervical cancer, gastric cancer, colon cancer, lymphoma, melanoma, leukemia. As cancer alters the quality of life to a great extent, aim of the study was to determine the quality of life and compare it among various types of cancers.

Objective: To evaluate the quality of life among general and oral cancer patients.

Materials and Method: 18 patients were selected (10 oral cancer and 8 general cancer patients). EORTC QLQ-C30 was the tool used for general cancer patients and UWQOL was the tool used for oral cancer patients and assessment done.

Results: The mean value of overall and health related quality of life in oral cancer patients were 32.8±4.84 and 28.7±4.71 compared to general cancer were 55.2±6.54 and 50.9±7.37, with significant difference(p=<0.05)

The important domains the oral cancer patients chose were pain (60%), swallowing (60%) and taste (60%).

General cancer patients, had a fairly favourable quality of life in relation to physical function(75%),cognitive function(75%), sleeping patterns(100%)

Conclusion: We found that general cancer patients led a better quality of life when compared with oral cancer patients. The oral and maxillofacial region is associated with appearance and important life-maintaining functions like mastication, speech, resulting in difficulty in coping up with the negative impact of the disease and treatment.

Clinical Significance: Quality of life in oral cancer patients will be altered to a greater extent, hence risk factors causing cancer should be identified and controlled.

Keywords: oral cancer, quality of life, radiotherapy, chemotherapy, general cancer.

Introduction

Cancer is a disease involving abnormal proliferation of cells and potential to invade to other parts of the body. The different types of cancer based on sites are oral cancer, breast cancer, lung cancer, prostate cancer, cervix cancer, gastric cancer, colon cancer, lymphoma, melanoma, leukaemia. Oral cancer is a malignant neoplasm which is found on the lip, floor of the mouth, cheek lining, gingiva, palate or in the tongue. Oral cancer is one among the most prevalent cancers in India. Chronic alcoholism, use of tobacco like cigarettes and smokeless tobacco, betel nut chewing and human papilloma virus(HPV) are the most common risk factors for oral cancer.

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General cancer patients are cancers occurring in rest of the body other than oral cavity such as breast cancer, lung cancer, prostate cancer, cervix cancer, gastric cancer, colon cancer, lymphoma, melanoma, leukaemia. Breast cancer develops from the breast tissues. They develop in the cells lining the milk duct and lobules that supply the ducts with milk. The cause of breast cancer include factors such as older age, family history of breast cancer, early menarche and late menopause, exposure to radiation, obesity, oral contraceptives, and alcohol consumption. Dietary patterns are also involved in the risk factors of breast cancer. It causes depletion of essential factor that normally protects against the development of breast cancer. Dietary habits such as high fat, low vegetables and fruits, low fibre and high carbohydrates may increase the risk of acquiring breast cancer. Circulating sex hormones like oestradiol, dehydroepiandrosterone sulfate, androgens, testosterone and sex hormone binding globulin are also associated with breast cancer risk.

Cervical cancer is a cancer arising from the cervix. Human papilloma virus causes cervical cancer in more than 90% of the cases. Other risk factors include smoking, weak immune system, birth control pills and multiple sexual partners.

Gastric cancer is the cancer developed from the lining of the stomach. The most common cause of infection is helicobacter pylori. The other risk factors include smoking, dietary pattern and obesity.

Cancer can alter and affect the quality of life of a patient based on varying degrees of severity depending on the site and the stage of cancer. Quality of life (Qol) is defined as an individual’s perception of their position in life, in the context of the culture and value systems in their life and in relation to their goals, expectations, standards and concerns. Its performance concern various aspects of life, including physical, psychological and social health. The evolution of the study of the QoL has allowed instruments used for its evaluation to become more precise to understand and compare the health status of populations, as well as for evaluating the impact of certain medical interventions, symptoms, and physical function over time and the ability to observe areas with greater problems to provide specific therapies.

Various literature studies show the quality of life in oral cancer patients and the quality of life in patients with cancer in other parts of the body. But literature is not available on the comparison of the quality of life between the different types of cancer and about which cancer patient has a better quality of life.

Hence this study aims in comparison of quality of life among oral cancer and general cancer patients undergoing radiotherapy and chemotherapy.

**Materials and Method**

Questionnaire for this study was formed with the help of various tools used in assessing the quality of life in cancer patients. Comparison of quality of life was done between oral cancer and general cancer. Two scales were used. EORTC QLQ-C30 instrument was used to determine the quality of life in general cancer patients. It is a 30-item questionnaire composed of multi-item scales. It includes four functional scales [physical (PF), cognitive (CF), emotional (EF) and social (SF)], three symptom scales (fatigue, pain, nausea and vomiting), and a global health and quality of life scale (QL). Remaining single items assess symptoms that are frequently reported by cancer patients, such as dyspnoea, loss of appetite, sleep disturbances, constipation and diarrhoea, and an item on the financial impact of disease and treatment. The responses were classified under favourable, fairly favourable and non favourable quality of life.

UW-QOL instrument was specifically developed for the QOL assessment of patients with cancer of the head and neck. It comprises of ten specific questions addressing important domains for the QOL assessment of patients with oral and oropharyngeal cancer like pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, taste and saliva. The patients were asked to choose 3 important domains each which affected them the most from the 10 domains listed in the questionnaire.

The study was conducted in Dr. Rai CBC centre, Saveetha dental college, Chennai. A total of 18 patients were selected for this study of which 10 were oral cancer patients and 8 were general cancer patients. Research was conducted with ethical clearance in accordance with the Helsinki Declaration of 1975, as revised in 2000.

The EORTC QLQ-C30 questionnaire was distributed among general cancer patients, UW-QOL questionnaire
among oral cancer patients. The questionnaire was in English. The questionnaire was translated into the regional language (Tamil) for the patient’s understanding and the answers were noted down.

The questionnaires were scored according to the scoring pattern given by the instruments. The data were entered into Excel sheet and the mean value and standard deviation was derived. The P value was determined.

**Results**

In a total of 10 oral cancer patients, 8 were male and 2 were female. The site of oral cancer are as follows: tongue (30%), lips (10%), pharynx (10%), floor of the mouth (10%), lower oesopharynx (10%), buccal mucosa (10%), soft palate (10%) and maxilla (10%) Figure 1. The domains the patients chose were pain (60%)(n=6) swallowing (60%)(n=6) taste (60%)(n=6), appearance (20%)(n=2), chewing (10%)(n=1) speech (10%)(n=1) and shoulder (10%)(n=1). Figure 2. The mean value and standard deviation of all the domains are mentioned in Table 1.

In a total of 8 general cancer patients, 7 were female and 1 was male. The site of general cancer are as follows: cervix cancer (62%), breast cancer (25%) and gastric cancer (13%) Figure 3. In relation to general, social functions, fatigue and gastric problems, 87.5% (n=7) patients felt that they were leading a fairly favourable life and 12.5% (n=1) of patients felt that they were leading a non favourable quality of life. 75% (n=6) of patients felt that they were leading a fairly favourable quality of life in relation to physical function, cognitive function, emotional function and pain. 25% (n=2) of the patients felt that they were leading a favourable quality of life in relation to physical function, 25% (n=2) fairly favourable quality of life in relation to cognitive function and 62.5% (n=5) of the patients had a non favourable quality of life and 37.5% (n=3) of the patients had a fairly favourable quality of life in relation to sleep patterns. Figure 4

The mean value of health related quality of life was 28.7±4.71 in oral cancer patients and 50.9±7.37 in general cancer patients. The mean value of overall quality of life was 32.8±4.84 in oral cancer patients and 55.2±6.54 in general cancer patients. Table 2 When comparing the mean value of oral and general cancer patients, oral cancer patients had a poor quality of life when compared with general cancer patients.

There was a significant difference in the health related and overall quality of life between oral and general cancer patients. (p=0.023) Table 2.
Table 1: Quality of life in oral cancer patients based on domains

<table>
<thead>
<tr>
<th>UW-QOL</th>
<th>MEAN</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>45.6</td>
<td>65</td>
</tr>
<tr>
<td>Appearance</td>
<td>65.2</td>
<td>26.87</td>
</tr>
<tr>
<td>Activity</td>
<td>30.6</td>
<td>22.9</td>
</tr>
<tr>
<td>Recreation</td>
<td>20.3</td>
<td>25.82</td>
</tr>
<tr>
<td>Swallowing</td>
<td>16.5</td>
<td>23.6</td>
</tr>
<tr>
<td>Chewing</td>
<td>15.5</td>
<td>24.1</td>
</tr>
<tr>
<td>Speech</td>
<td>37.1</td>
<td>37.7</td>
</tr>
<tr>
<td>Shoulder</td>
<td>67.2</td>
<td>35.9</td>
</tr>
<tr>
<td>Taste</td>
<td>10.7</td>
<td>31</td>
</tr>
<tr>
<td>Saliva</td>
<td>35.4</td>
<td>20</td>
</tr>
<tr>
<td>Mood</td>
<td>35.8</td>
<td>26.8</td>
</tr>
<tr>
<td>Anxiety</td>
<td>44.3</td>
<td>29.5</td>
</tr>
</tbody>
</table>

Table 2: Health Related quality of life and Overall quality of life among oral cancer and general cancer patients

<table>
<thead>
<tr>
<th></th>
<th>MEAN</th>
<th>SD</th>
<th>( p&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health related</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>quality of life</td>
<td>oral cancer patients</td>
<td>28.7</td>
<td>4.84</td>
</tr>
<tr>
<td></td>
<td>general cancer patients</td>
<td>50.9</td>
<td>6.54</td>
</tr>
<tr>
<td>Overall quality of life</td>
<td>oral cancer patients</td>
<td>32.8</td>
<td>4.71</td>
</tr>
<tr>
<td></td>
<td>general cancer patients</td>
<td>55.2</td>
<td>7.37</td>
</tr>
</tbody>
</table>

Discussion

In oral cancer patients, the most common site of cancer was found to be the tongue with 30%. Oral cancer was found to be more prevalent in male patients with 80%. Adverse habits such as smoking, drinking and pan chewing attributed to this condition. Patients were asked to choose 3 factors which affected them the most from pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, taste, saliva, mood and anxiety. The most important domains were pain, swallowing and taste followed by appearance and then chewing, speech and shoulder.

In general cancer patients, the most common site of cancer was found to be cervix with 62%. General cancer was found to be more prevalent in female with 87.5%.

There was a significant difference between the health related and overall quality of life of oral and general cancer patients. \( p=0.023 \). There was a significant difference between the overall and health related quality of life in oral and general cancer patients.

In a study conducted in brazil, 28 oral cancer patients appraised their health-related QOL at the baseline as worse than during the month before diagnosis, at the one-year follow-up, the proportion was reduced to one third.\(^{12}\)

Budischewski et al\(^{13}\) used EORTC QLQ-C30 tool to study QOL in 61 breast cancer patients at the beginning of RT and 6 weeks after RT was completed. These authors achieved a response rate of 68 % at their post-RT time evaluation, whereas our response rates for the same questionnaire at 1 and 6 months post-RT were 96 and 86 %, respectively.

Bansal et al\(^{14}\) used the EORTC tool to evaluate 45 patients with head and neck cancer at three time points: the start of RT, fourth week of RT, and 1 month after RT. These authors found that global health status and physical, social, and emotional functioning all declined significantly during RT. One month after RT, they observed improvement in all the functional scale scores, but none had returned to pre- RT levels.

Most of the Oral cancer patients are associated with adverse habits like tobacco usage, pan chewing that creates negative coping, esthetical disfigurement, difficulty in speech, swallowing.
Chewing, taste, hampers day to day functioning of life, affecting physical, psychological and social health resulting in poor quality of life compared to general cancer patients.

Quality of patients on the whole in cancer patients are affected but oral cancer patients suffer more due to the involvement of oral cavity in appearance, speech, mastication, taste.

There are deficient studies that compares the quality of life between oral and general cancer patients. More studies should concentrate on comparison of quality of life among various cancer patients in order to understand the quality of life the patient undergoes during their course, identify the risk factors and effective steps to be taken to control cancer.

**Conclusion**

We found that general cancer patients led a better quality of life when compared with oral cancer patients. The oral and maxillofacial region is associated with important life-maintaining functions like breathing, mastication, speech, etc. The surgical resection of oral cancer often results in disfigurement of face, alteration of speech, decreased ability of mastication, change in taste, etc leading to a poor quality of life. While providing a disease-free life to a cancer patient is definitely an important goal, the ultimate aim is to provide an acceptable quality of life for the comprehensive physical, emotional and social well-being of all patients. The quality of life will be altered to a greater extent in cancer patients with or without treatment. Thus, the ultimate goal must be in preventing cancer.

**Clinical Significance:** Quality of life in oral cancer patients will be altered to a greater extent, hence potential risk factors causing cancer should be identified and controlled.

**Conflict of Interest** – Authors have no conflict of interest

**Source of Funding**- Nil

**Ethical Clearance** – Nil, Questionnaire study

**References**


Introduction: The deposition of colouring matter, coloration or discolouration by a pigment pertaining to the gingiva is called gingival pigmentation. The development of pigmentation is regulated by the individual’s genetic make-up. The normal physiological colour of gingiva is coral or salmon pink with physiological variations of melanin pigmentation. Melanin is a non-hemoglobin derived brown pigment produced by melanocytes. In this study, we will be studying the prevalence and causes of pigmentation of gingiva.

Materials & Materials: Fifty dental undergraduate and postgraduate students from Saveetha Dental College were included in a questionnaire based study that assessed their knowledge and practice on gingival pigmentation and their answers were evaluated.

Results: Among fifty subjects, only 8.16% hadn’t come across a patient with gingival pigmentation due to pathological factors these were mostly third year students. A good value of 91.84% experienced a patient with gingival pigmentation due to pathological factors with a SD ±0.27 and most of them particularly the senior students had good knowledge about gingival pigmentation. The most reported cause for gingival pigmentation was the consumption of tobacco, 24.49% then an 18.37% due to amalgam tattoo, followed by smoking and usage of anti-malarials with a 14.29%.

Conclusion: The senior most class, the interns were more knowledgeable about the prevalence and causes of gingival pigmentation. The subjects included in this study were over-all educated about the causes and the concept of gingival pigmentation.

Keywords: gingival pigmentation, discolouration, melanin, oral mucosa, aesthetic

Introduction

Pigmentation is discolouration of the oral mucosa or gingiva due to the wide variety of conditions and lesions. Oral pigmentation has been associated with various systemic and localized conditions. Oral pigmentation has been associated with a variety of endogenous and exogenous etiologic factors. Most pigmentation is caused by five primary pigments namely, melanin, melanoid, oxyhemoglobin, reduced hemoglobin and carotene. Of all these, the most commonly observed pigment in oral mucosa is melanin. The clinical history, symmetry and uniformity of the lesion are crucial in determining the clinical differential diagnosis. Melanocytes are branched or dendritic cells which are found at the epidermal and dermal junction of the skin and mucous membrane that form melanin. The melanocytes are situated in the intercellular epidermal areas and form complex outlines by their long processes

The gingiva is the most frequently pigmented tissue in the oral cavity. Dummett and Baren's implicated many systemic and local factors as causes of changes.
in oral pigmentation. The deposition of coloring matter, coloration, or discoloration by a pigment pertaining to the gingiva is gingival pigmentation. Physiologic pigmentation which is the main condition observed, probably is determined genetically. However, as Dummett suggested, the degree of pigmentation is related part to mechanical, chemical and physical stimulation. High levels of oral melanin pigmentation usually are observed in individuals of African, East Asian or Hispanic backgrounds. Clinically, gingival pigmentation does not present medical problems, it is more of an aesthetic concern for patients. A periodontal plastic surgical procedure known as Gingival depigmentation is employed whereby the gingival hyperpigmentation is removed or reduced by various techniques.

The gingivae are the most frequently pigmented intraoral tissues. The most common location was the attached gingiva (27.5%) followed in decreasing order by the papillary gingiva, the marginal gingiva, and the alveolar mucosa. Gingival pigmentation can occur due to pathological reasons as well, it has been associated with a variety of lesions and conditions such as endocrine diseases like Addison’s disease, Albright’s syndrome, Acromegaly, Nelson’s syndrome, exposure to heavy metals e.g. lead, bismuth, mercury, silver, arsenic, gold. In children, the possible sources of exposure include lead contaminated water or paint and mercury or silver containing drugs. It can be related to deadly diseases such as Kaposi’s sarcoma. It is the most common malignancy associated with human immunodeficiency virus infection and it may potentially affect every part of the body. Although, palate is the most common site of site of AIDS related Kaposi’s sarcoma, intraoral lesions may also involve the gingiva and other areas and HIV oral melanosis. Such patients undergo hyperpigmentation of skin, nails and mucous membrane. The etiology of such hyper pigmentation remains undetermined though it may be attributed to medication or adrenocortical involvement by opportunistic parasites.

It may also be drug induced as a variety of medications, common pathological cause of gingival pigmentation is smoking associated melanosis, tobacco consumption and gingivitis, accidental displacement of metal particles in oral soft tissues during restorative dental procedures using amalgam may result in amalgam tattoo.

Though there is abundance in knowledge on the depigmentation methods, there is inadequate knowledge of what gingival hyperpigmentation is. Thus, the motivation of this study was to assess the knowledge of dental students (III, IV years and interns) about gingival pigmentation due to pathology and its causes. There has been no study in the region regarding the issue thus there is a gap that needs to be filled. One of the aims of this study was to fill this gap.

**Materials and Method**

This study included a sample of 50 students, studying in Saveetha Dental College and Hospitals, in their III, IV year and interns who are assigned to practice on patients as the dental hospital serves as a training institution for undergraduate and postgraduate dental students and is a major referral center for dental cases. The subjects were administered with a questionnaire on their experience of coming across patients having gingival pigmentation, their causes and prevalence.

The questionnaire was created by using a survey-tool app, Survey Planet and was distributed among the students.

**Results**

Among these 50 subjects, only 8.16% hadn’t come across a patient with gingival pigmentation due to pathological factors these were mostly III year students. A good value of 91.84% experienced a patient with gingival pigmentation due to pathological factors with a SD ±0.27.

It may also be drug induced as a variety of medications, common pathological cause of gingival pigmentation is smoking associated melanosis, tobacco consumption and gingivitis, accidental displacement of metal particles in oral soft tissues during restorative dental procedures using amalgam may result in amalgam tattoo.

The chief complaint of the patient were scaling, dental caries, routine check-up, malocclusion and bleeding gums. However, only 4% presented a case of gingivitis (SD ±1.78).
When asked about the diagnosis of the excessive pigmentation, the answers varied from gingivitis to usage of acne medication. The most reported cause for gingival pigmentation was the consumption of tobacco, 24.49% then an 18.37% due to amalgam tattoo (pigmentation due to tooth restoration material), followed by smoking and usage of anti-malarials with a 14.29%. Usage of acne medication, particularly, Minocycline and exposure to heavy metals were the reported cause by 10.20% of the subjects. It was strange to note that only 8.16% of the subjects diagnosed the cause of their patient’s gingival pigmentation as gingivitis.

Melanin hyperpigmentation usually does not present as a medical problem, but patients may complain their black gums are unaesthetic. This problem is aggravated in patients with a gummy smile or excessive gingival display depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The questionnaire presented to the subjects asked them about the treatment plan they would suggest for gingival hyperpigmentation to assess their awareness about it. Majority of the subjects said they would advise Laser Gum Bleaching (64.58%) and about 16.67% advised Cryosurgery, 10.42% voted for Scalpel Surgery, an 8.33% for Electro surgery and it was good to know that 0% of the students said that they would advise gingivectomy unless it’s a severe and needed treatment plan.

In more than half of the cases, the patients were smokers or tobacco consumers (54.17%) whereas only 45.83% were non-smokers. The prevalence of gingival pigmentation was tested by questioning the subjects about the gender more susceptible to gingival hyperpigmentation and 81.25% felt it was males and 18.75% observed more hyperpigmentation in females.

It was evident that the majority of the interns, i.e., 48% had more knowledge about hyperpigmentation of gingiva and it’s causes as they were more experienced in the field. As most of them were females, it is agreeable that females were more educated about gingival pigmentation. However, according to Shankar et al., the difference in perception of gingival pigmentation among males and females was not statistically important and the occurrence did not vary with age or gender which did not correlate with our result of the increased occurrence in males. The reason that the patients visited...
the subjects in the first place gives us an initial look into the causes of hyperpigmentation. From the results it is apparent that people weren’t aware about their pigmentation being associated with a variety of lesions and conditions. According to Matundra T et al, only 27% of the subjects found the gingival hyperpigmentation unaesthetic and desired to get treatment.\(^\text{22}\)

Intraoral pigmentations could be focal, diffuse or multifocal. They may be black, gray, blue, purple or brown in color. They may be flat or swollen. They can be localized accumulations of melanin, hemosiderin, exogenous metal or some are even indications of an internal disease. The differential diagnosis can belengthy in certain conditions with multiple and complex lesions with pigmentations.\(^\text{23}\) The students’ diagnosis of the gingival hyperpigmentation was assessed and the most reported cause was the consumption of tobacco and smoking which further causes smoker’s melanosis. This correlated with the study done by Hagoo et al who demonstrated that smoking is a contributing factor to gum hyperpigmentation.\(^\text{24}\)Smoking may cause oral pigmentation in light-skinned individuals and accentuate the pigmentation of dark skinned patients.\(^\text{25}\) There is increased production of melanin, which may provide a biologic defence against the noxious agents present in tobacco smoke.\(^\text{26}\) Smoker’s melanosis occurs in up to 21.5% of smokers.\(^\text{27}\) The intensity of the pigmentation is related to the duration and amount of smoking.\(^\text{27-28}\)

The second leading cause of gingival pigmentation reported was amalgam tattoo, 18.37%. The pigmentation of the oral mucous membrane by tooth restoration material (amalgam) is a common finding in dental practice. The lesion represents embedded amalgam particles and usually manifests itself as an isolated bluish or black macule in various areas.\(^\text{1}\) However, Ghanpanchi J et al., reported only 3% occurrence of amalgam tattoo even though it is common.\(^\text{6}\) The much lesser reported cause was due to usage of drugs and exposure to heavy metals. Minocycline is a synthetic tetracycline that is commonly used in the treatment of acne vulgaris. Although tetracycline causes pigmentation of bones and teeth, minocycline alone is also responsible for soft tissue pigmentation. It is typically seen as brown melanin deposits on the tongue, gingiva, hard palate and the mucous membrane.According to Matundra T et al, almost all the subjects who were on medication had gingival hyperpigmentation.\(^\text{22}\)

Demand for enhancing therapy of gingival melanin pigmentation is common and various methods have been used for depigmentation, each with its own advantages and restrictions.\(^\text{29}\) Most of the subjects suggested Laser Gum Bleaching as a treatment option and the least number suggested gingivectomy. Lasers have the advantages of easy handling, short treatment time, haemostasis, and bactericidal effects.\(^\text{10}\) The Nd: YAG laser produces invisible, near infrared light with a wavelength of 1064 nm. This type of laser is used to eliminate various types of hyper pigmented lesion in dermatological surgery, as well as to produce depigmentation in skin.\(^\text{10}\) Treatment by diode lasers is a better option than Nd: YAG laser as they do not produce any deleterious effects on the root surface of teeth as reported by Lagdive S et al, and it has the unique characteristic of removing only a thin layer of epithelium in a clean manner.\(^\text{31}\) More than 80% of the subjects observed and knew that dark skinned people were more susceptible to gingival hyperpigmentation than fair skinned ones. anatomic distribution of melanin pigmentation in the gingiva and also quantify it in a South Indian population, who have darker skin color owing to more melanin content, and tend to have more oralpigmentation than their counterparts in North and Northeast India. This could be attributed to their genetic traits.\(^\text{32}\) Looking into the location of the gingiva which was most pigmented, students reported attached gingiva being the most pigmented followed by papillary gingiva.

This correlated with the results reported by Ponnaiyan et al, that majority of the subjects had pigmentation in the interdental papilla and attached gingiva.\(^\text{33}\)

**Conclusion**

The senior most class, the interns were more knowledgeable about the prevalence and causes of gingival pigmentation. The subjects included in this study were over-all educated about the causes and the concept of gingival pigmentation. This may be due to the inclusion of the same topic in their curriculum and/or due to the seminars and conferences conducted on gingival pigmentation and its treatment modalities.

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References


Impact of Pre and Post National Level Eligibility Examination on Dental Education System

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Abstract

Preadmission factors is consistent across higher education disciplines and is quantified through a well-defined minimum and maximum level of achievement. Dentistry is a highly skill oriented profession which requires highly motivated academic and clinical orientation involving intense hard work and dedication for a successful career. The selection process with the advent of computerisation has become more mechanical involving minimum human intervention. Combination of many factors are chosen to predict the academic performance of medical and dental students post admission into the dental school. Entrance examination and education systems should lighten up the lives of students, cherish their dreams, and reward their hard work. A single entrance examination like NEET system followed in India in a stricter sense cannot truly reflect the aptitude and intelligence of students. Ultimately, if the system of entry is streamlined and academic along with clinical calibration is ensured, the concept of exit examination can be waived so as the student can be ready for practice or postgraduate studies.

Keywords: NEET, Dental education, Impact, Entrance examination

Introduction

Preadmission factors is consistent across higher education disciplines and is quantified through a well-defined minimum and maximum level of achievement. Achieving at a high level in preadmission factor scores is considered an excellent predictor of the likelihood for student success in their educational program. Preadmission factors, defined broadly, are the scores or grades used to evaluate the academic and personal readiness of a prospective student to enter graduate-level specialty training. Professional College is a graduate school-level institution, the purpose of which is to prepare students for a specific career field. Examples of professional schools offering specialized advanced degrees include medicine, business, dentistry, engineering, law, among many others degrees.

Specialization requires a narrow focus on developing the necessary skill level to become an expert in that discipline. Expertise is derived from substantial training, which is nontransferable and utilizes higher order principles to solve problems with more accuracy. In order for excellence to occur, the demonstration of acquired expertise is seen as a necessary requirement within the discipline of study. Dentistry is a highly skill oriented profession which requires highly motivated academic and clinical orientation involving intense hard work and dedication for a successful career.

Students from varied regional, academic and socioeconomic backgrounds seek admission to the dental schools. The admission qualifications and entry criteria vary greatly in different countries. In many Asian countries, students can seek admission to undergraduate dental degree course soon after they leave the secondary schools. Also, the students compete for limited number of seats. Selection criteria vary greatly, depending upon the country and even within the same country, different entry qualifications and procedures are mandatory to

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Selection Process in Different Countries

Demand for dental profession has always been on the high until recent times owing to its importance in the society. The profession may be taken as personal choice or as a second choice in many situations to medicine.

The selection process with the advent of computerisation has become more mechanical involving minimum human intervention. In most of the cases, faculty members are not involved in the selection of the students, except in very few select institutions, where a panel of academicians perform this task. However, the responsibility of helping the students to progress in their career is totally dependent on the academic institution. Institutions across the globe have adopted diverse methods to achieve the best selection criteria. Arabian Gulf University, Iran, and in Chile have defined a grade of 80-90% in high school, national university entrance examination (Konkoor) score along with an interview to test their effective and psychomotor skills which have been set as a requirement for admission.

All dental schools in the United States utilize the applicant’s general undergraduate grade point average (GPA), the undergraduate science grade point average (SGPA), and the Dental Admission Test (DAT) scores as factors for admissions. The DAT is a necessary tool to compare students from different schools as it is the only national standardized test available for dental school admissions. The DAT consists of a Quantitative Reasoning Test, a Reading Comprehension Test, a Survey of the Natural Sciences, and a Perceptual Ability Test. In order to optimize the admissions and graduation process, it is critically important that dental schools be able to predict the future academic performance and clinical competency of students in the dental curriculum. The evidence based literature is sated with the effects of different variables on predicting student performance at dental schools. Many studies have assessed the relationship between predictor variables and student performance in preclinical or restorative laboratory courses, but there have been few studies emphasizing overall clinical performance. Predental exams and preclinical predictors have largely shown insignificant correlation with preclinical laboratory course performance.

Combination of many factors are chosen to predict the academic performance of medical and dental students. Various cognitive factors have been identified as contributory to the learning outcome of students in the past. In recent years, various non-cognitive factors also have been attributed to the performance of the students. These factors significantly contribute to the success in practice. A possibility of employing the predictive power of personal statements and evaluations to improve the academic performance has not been explored fully. This forms an important part of current selection process in developed countries such as United Kingdom. A few similar studies have been reported from medical and dental schools in other countries as well, out of which many are from countries in the Middle East.

Indian Scenario

In India to standardise the admission procedures, Medical Council of India (MCI) and Dental council of India (DCI) have introduced National Eligibility Cum Entrance Test (NEET) as the entry requirement for the undergraduate medical and dental course from 2016. Further, MCI has also suggested that it may be desirable to introduce an exit examination which will screen the academic competencies of the qualifying doctors, who are expected to carry out healthcare activities in the country. These efforts would, address the issue of academic competencies of the incumbent graduate.

Before NEET was mandatory, the cut off marks were 50% marks for general and 40% for the reserved. From 2016, 50th and 40th percentiles. This opened the doors for candidates under just 18 – 20% in the NEET. With just 5% marks in physics, 10% in chemistry and 20 odd percentile in biology of NEET candidates got admission into medical and dental courses in the past 2 years. Percentile measures the proportion not the score. This 50 percentile measures students with more marks than the bottom half, 90th percentile comprise students with more marks than the bottom 90% and so on. It does not mean they have 90% marks. Percentile cut offs introduced for NEET lowered the marks bar became counterproductive.

The problem of dental education starts with the admission. Most of the dental students opt for dentistry as a second choice because they do not get through Medicine course through common entrance test for medicine, dental and other paramedical branches. Thus,
most if not all, dental admissions are not by choice and this leads to lack of interest in the dental practice\textsuperscript{14}.

The solution for this problem is separate entrance for dental curriculum as only those genuinely interested students with good dental acumen and aptitude will get selected and not as a second choice. Another factor in Indian dental education system is more of a theoretical approach to various subjects. Practical training in some dental schools where patient flow is good is excellent, especially in government and very few private dental colleges, but in the schools where the patient flow is less, the student do not develop the confidence in treating patients. The problem base learning and teaching along with advance technology will give an overall perspective to dental students to handle a patient in private practice as it has become the norm of the day.\textsuperscript{15}

Studies focussing on these attributes in Indian medical students are scanty. There have been reports suggesting various parameters as predictors of academic excellence during the dental graduate course \textsuperscript{16}. Medium of instruction during secondary school education posed as an important factor contributing to a successful graduate course education. Hence English medium education has been identified quite often as an enhancing factor for success. It is well known that scholastic success is guided by cognitive factors like pattern of thinking, levels of interaction, adaptation over time.\textsuperscript{17} In addition to these, success of a dental graduate is also dependent upon other qualities such as commitment to practice dentistry, compassion, empathy, sense of professionalism which are collectively grouped as non-cognitive factors. These factors may have a direct positive relationship to student’s performance and their future outcomes. Moreover all these factors tend to act as variables which could influence the progress of a prospective student in their journey of graduation and future.

Dental education system nuances

Dental curriculum involves intense training, dedication of time and effort by students. Medical education is supported also by heavy funding and non-completion of the course can be a burden to the society. Therefore it becomes important to identify the students who require remedial measures and implement early intervention. These students who lack motivation require a support system, if they were to continue the course. If it is possible to predict students who might have trouble in achieving the required academic competencies, it should be possible to help these students by way of tutoring or mentoring, thereby ensuring continued progress of the students and avoid failures. Nottingham studies suggest that 10-15\% of the medical student intake face crucial problems academically.\textsuperscript{18} Though these students have been selected to study medicine by rigorous cognitive screening procedures, several non-cognitive factors had also significant role in completion of the course. Most of the students who participated were well motivated showing that they were determined to complete their medical studies with good honours. Small number of students who were not motivated and took this course on account of some pressure needed guidance to pursue the course or must be channelized towards their field of interest. Even students with good aptitude required guidance on learning and test taking strategies in order to accomplish success in completing their curriculum within stipulated time. Elimination of fear factor with constant reinforcement by the faculty by providing additional guidance and appropriate mentoring have complimented all the above factors. Thus students with fear factor need to be addressed as just studying alone may not be helpful to complete this professional course and this deficit can be easily corrected with appropriate measures.\textsuperscript{19}

Eligibility Norms

The National Academy of Sciences, USA, has identified and enlisted the issues with curriculum such as basic science concepts weakly connected to clinical education and experience, curriculum not sufficiently at par with the current dental sciences and practice, implementation of comprehensive patient care as a model of clinical education, and the most important one in which dental curriculum being overcrowded does not allow for the development of critical and logical thinking.\textsuperscript{20} The overall treatment planning should be taught for a patient as a whole rather than one subject at a time. Another most important curriculum change needed in dentistry so as to reduce the attrition of students not opting for dentistry as a first option is to teach or make them aware of dental practice economics.

Little information is available in the literature regarding the relationship of predental and preclinical predictors to productivity and success in the clinical
environment of a dental school. While preclinical predictors typically evaluate the fund of biomedical and basic science knowledge, it is not unreasonable to suggest that success in evaluating and solving scientific and biomedical problems has direct correlations to addressing, evaluating, and solving problems in a clinical setting. Although some of the skills required to effectively treat patients in a clinical setting may not have direct associations with more academic measures, there is likely some overlap between the skill sets required for academic success and those for clinical success.21

Students who succeed academically are typically highly motivated, organized, creative problem-solvers. These same attributes can be plausibly linked to those who perform well in clinical settings.

One can consider different possibilities for student skill set pairings. Some students may have significant success with didactic work but lack the psychomotor skills to perform at an equivalent level clinically. Alternatively, there may be some students for whom didactic learning is a significant challenge, but who have excellent hand skills. Associations between the predictors and clinical outcomes in these students may be inconsistent, as students may be able to successfully compensate based on their stronger skill area, a student with excellent hand skills may be able to compensate for a lack of didactic knowledge. While certain knowledge gaps may be evident between students at different times during the course of their dental education, these gaps will eventually be filled with knowledge gained from clinical experience. In other words, all students reach the same point of clinical competence prior to graduation. With regard to clinical productivity, it may be that once clinical thresholds for a given procedure are achieved, students feel little to no incentive to seek out additional procedures and may end up transferring patients to other students. Finally, it may be that clinical evaluations cannot be effectively compared to standardized examinations due to the subjective nature of faculty grading for clinical procedures and variability between clinical faculty in terms of the amount of assistance given to students.22

**Institutional Observation**

An initial observation at our institution where we compared the performance of students who had entered through the common entrance examinations along with the dexterity and aptitude tests and students who had entered through NEET qualifying examinations. Most students initially rated as high or low achievers as per the NEET scores and the non NEET examination scores, the performance among through Non NEET exam Qualifiers were significantly better than the NEET exam qualifiers in the final university examination.

**Conclusion**

A single entrance examination like NEET in a stricter sense cannot truly reflect the aptitude and intelligence of students. Ultimately, if the system of entry is streamlined and academic along with clinical calibration is ensured, the concept of exit examination can be waived so as the student can be ready for practice or postgraduate studies.

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**References**


Effectiveness of SMS Feature of Mobile Phone in Management of Type 2 Diabetes: A Review

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Abstract

The objective of this review is to evaluate the effectiveness of SMS feature of mobile phones in management of type 2 diabetes in different countries, their potential role in clinical and community settings, and the current state of research. A comprehensive electronic search was conducted and studies from 2004 to 2018 were included. In this review 32 articles were included in which number of people participated were 18-955, age of participant lies between 16-75 yrs, participants received interventions for the duration of 1 to 24 month. Messages were categorized into 3 types-reminder messages, messages for treatment assistance and educational and motivational messages. It was observed that there was significant improvement in blood sugar and HbA1c levels of the patients, adherence to medical advice, health lifestyle, knowledge and self-efficacy, user satisfaction with intervention was also assessed in many studies which was found to be high. Significant evidences are there to prove that mobile phone SMS service used in reminders, disease monitoring and disease management is highly useful in improving the glycemic control of Type 2 Diabetes patients.

Keywords: Type 2 diabetes, mobile phone, short message service, intervention, type 2 diabetes management.

Introduction

As per the latest report given by International telecommunication union, no of mobile phone subscriptions are more than total number of people on earth. By the end of the year 2018 mobile-cellular subscriptions touched the mark of 8 billion. In developed countries saturation rate is reached, with only modest growth in the last five years, but growth in developing countries is sustained ¹. Mobile phone text messaging shows strong potential as a tool to achieve optimal health care. The biggest advantage of text messaging lies in its being asynchronous, as it can be accessed at any time that is convenient to a subscriber. Furthermore, even if a phone has been turned off, messages get delivered when the phone is switched on again² inexpe nsive, and instant. This systematic review provides an overview of behavior change interventions for disease management and prevention delivered through text messaging. Evidence on behavior change and clinical outcomes was compiled from randomized or quasi-experimental controlled trials of text message interventions published in peer-reviewed journals by June 2009. Only those interventions using text message as the primary mode of communication were included. Study quality was assessed by using a standardized measure. Seventeen articles representing 12 studies (5 disease prevention and 7 disease management.

Research evidence has shown that mobile technology is found to be beneficial in dietary and weight management³,⁴, physical activity involvement⁵,⁶ and asthma control⁷,⁸ along with diabetes management. Diabetes management is multifaceted task requiring education about glucose monitoring, lifestyle modification like weight management, exercise and diet and also managing diabetes complications and review of all medication

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details, all these regimens take considerable time in the restricted clinic visit. This requires continuous communications between the healthcare providers and patients for successful management, especially in those patients who have difficulty in controlling their diabetes. The use of telemedicine and mhealth systems can facilitate communications between patients and their medical team for better training on corrective actions that can be taken and generic messages include topical "newsletters" and anonymized tips from other participants. The system also allows patients to submit data and questions to the diabetes care team.

**OBJECTIVES:** The aim was to explore how patients with type 1 diabetes interact with the Sweet Talk system in order to understand its utility to this user group.

**METHODS:** Subjects were 64 young people with diabetes who were participating in the intervention arms of a randomized controlled trial. All text messages submitted to Sweet Talk during a 12-month period were recorded. Messaging patterns and content were analyzed using mixed quantitative and qualitative methods.

**RESULTS:** Patients submitted 1180 messages during the observation period (mean 18.4, median 6).

Non-adherence is a serious challenge to chronic disease management with an average adherence rate of only 50% among patients with chronic diseases.

In 2014 the global prevalence of diabetes was estimated to be 8.5% among adults aged 18+ years. Because of the seemingly ubiquitous nature of mobile phones, many researchers and healthcare providers have used mobile phones as a way to educate or help people to manage their diabetes which will be reviewed in the current review article.

The capacity of mobile technology is touching new heights. Current technologies are facilitating low cost interventions. There are potential economies of scale due to its ease of use and ease of providing large scale intervention for large populations [recent examples are high use of mobile application, large scale distribution of useful messages]. Mobile technologies which are utilized most often are text messages (SMS), mobile applications, and multiple media [MMS and photos] interventions. These technologies supports interaction between healthcare providers and patients, which allows people to obtain extra help when needed.

Existing review studies on mhealth interventions gives attention to areas like application of specific devices e.g., mobile phones, or specific functions of the mobile phone e.g., text messaging can be individually tailored, and allows instant delivery with asynchronous receipt, suggesting potential as a delivery channel for health behavior interventions. Evidence acquisition: An electronic database search was conducted for studies published between January 1990 and March 2008. Studies were included in the review if they (1) or individual diseases or different disease management e.g., diabetes care or chronic disease management.

The objective of this review is to evaluate the evidence on the impact of SMS technology based intervention in improving health outcomes, processes of care and behavior change for persons with type 2 diabetes.

**Method: Data Source**

A comprehensive electronic literature search was conducted, and articles published till 2018 were included, using Google Scholar [Google, Mountain View, California], and PubMed [US National Institutes of Health’s National Library of Medicine NIH]. Studies from 2004 to 2018 were included in the review. The following search terms were included in various combinations: type 2 diabetes, phone, cell phone, mobile phone, text, text message, short message service, SMS, mhealth, health behavior, prevention, intervention, adherence.

**Inclusion and Exclusion criteria**

Inclusion criteria required that studies be randomized, non-randomized, quasi-experimental controlled trials or pre-post interventions for diabetes management, in any population, that used text messaging as the primary mode of intervention. Studies were required to measure the impact of text message interventions by assessing change in health behavior, health outcomes, and/or clinical outcomes using pre/post-tests. Additionally, studies had to be published in a peer-reviewed journal.

Studies utilizing communication technologies other than mobile phone text messaging, such as the Internet, e-mail, phone calls, or video messaging, were included only if text messaging was the primary mode of communication and the other technologies were supplementary. Review articles, study protocols and
commentaries were excluded.

**Result**

The earliest year of publication of study which is included is 2004. The sample sizes taken in the studies ranged from 18 to 955. Studies took place in several countries including Spain, S. Korea, U.S.A, New Zealand, Bahrain, Iran, Saudi Arabia, Philippines, Netherlands, Senegal, Democratic Republic of Congo, Philippines, Cambodia, Egypt, India, and Bangladesh. Patients were recruited from primary, secondary, and tertiary health care centers. On reviewing it was found that based on SMS the interventions could be divided into three categories which are as follows:

**Reminder Messages:** Patients often experience difficulties in following the recommendations provided by health care providers. Adherence to oral anti-diabetics is reported to be in the range of 36% to 93%\(^{25}\). Though reasons for not following a particular regimen are diverse but the most commonly discussed barrier is forgetfulness\(^{26,27}\). If patients get reminders about following their diabetes management it could be of immense help\(^{28,29}\). Several interventions were given to the patients which were found to be useful in increasing medication adherence, self-monitoring of blood glucose and adhering to daily healthy regimen.

In a study conducted by Roca et al. (2004) a web based server was created which was capable of receiving and displaying patients data. In this server patients can enter their daily measurements [eg blood glucose levels, body weight etc] using their mobile phones. Pre-recorded acknowledgements sent to their phones in addition 5 more messages were sent about their monthly HbA1C value, message with advice, automatic reminders and warning messages (total 25 messages)\(^9\).

Similar system was developed by Dick et al. (2011) SMS-DMcare, this was basically a reminder system which reminds patients about their medication, blood glucose monitoring, foot care and appointments with their healthcare providers. The purpose of this study was to investigate the feasibility of using short message service in assisting self-management of diabetes\(^30\).

Fischer et al. (2012) developed a software platform, this system sent text messages prompts requesting fasting blood sugar values for three fixed days in a week and send appointment reminder messages to patients three times in advance. The objective behind this intervention was to assess the feasibility of involving adults having diabetes, in self-management behaviors between their two clinic visits by using cell phone text messaging to provide blood sugar measurement reminders and appointment reminders\(^31\).

Vervolet et al. (2012) developed a real time medication monitoring electronic medicine dispenser which is equipped with a GSM system. Every time a SMS is sent to the patient, when the dispenser is not opened within prescribed time, reminding patients about their missed medication. This greatly helped in adhering to medication\(^12\).

**Messages For Treatment Assistance:**

Combination of world wide web and mobile phones SMS features is found to be very efficient in providing individualized care to the patients. Increasing the patient-healthcare provider contact have the potential to increase the adherence from the side of patient and ease of providing care from the side of healthcare provider. In the following studies the system was created which worked like virtual clinic which provided real time individualized care to the patients.

In a study conducted by Kwon et al. (2004), researchers developed an intervention in which a specialized web based diabetic patient management system was created. In this system all the medical history along with socio-demographic details and other information like smoking and alcohol history of patients was stored. During the study all the patients could contact their healthcare provider through specialized electronic chart on the web and they also sent their self-monitored blood glucose levels, medication dosage and hyper and hypoglycemic events. In return physician sent back recommendations via SMS on drug adjustment, dietitian and nurses sent recommendations related to medical nutrition therapy and exercise. The period of the intervention was three months. Biochemical measures changes seen after the intervention\(^23\).

Another study was conducted by Kim et al. (2007), in the study was conducted to see the effect of text messaging on plasma blood glucose levels of diabetic patients for the period of six months. In this study also a website was developed in which all medical and other
relevant history of patients were recorded in the software system. Patients could access the website and need to enter their daily blood glucose value, drug information etc. in the system. Optimum recommendations based on these inputs were sent by researchers via SMS weekly to the patient. For eg messages like, ‘Please add one tablet of sulfonylurea in the evening’; ‘Lack of exercise may be the cause of the aggravated glucose level’. This six month intervention consisted of continuous diabetes education and suggestions related to diet, physical activity, medication and self monitoring of blood glucose.

Same interventions were given by Kim et al(2006) for 12 weeks , Kim et al(2008)6, 9, and 12 months. Methods: This is a quasi-experimental design with pre- and follow-up tests. Participants were recruited from the endocrinology outpatient department of tertiary care hospital located in an urban city of South Korea. Eighteen patients were randomly assigned to an intervention group and 16 to a control group. The goal of the intervention was to decrease body weight and keep blood glucose concentrations close to the normal range. Patients were requested to record their blood glucose level in a weekly diary on the website by personal cellular phones or computer internet. The researcher sent optimal recommendations to each patient, by both the cellular phone and the Internet weekly. The intervention was applied for 1 year. Results: Glycosylated hemoglobin (HbA1c and Yoon et al(2008) for 1 year each.

Faridi et al.(2008) developed an interactive informational feedback system called NICHE [Novel Interactive Cell-phone technology for Health Enhancement] which used wireless remote technology to provide tailored feedback and reminders, based on patient specific data to patients via SMS. In this the patients were required to upload their fasting blood glucose and pedometer reading daily on NICHE server in response to that they received tailored messages related to HbA1c, BMI, blood pressure, physical activity, diabetes self-care and self-efficacy.

In an intervention given by Hussein et al (2011), a new approach was introduced to increase interaction with healthcare provider. In this case control study the intervention group was provided with two mobile numbers one of the clinician [SMS-MD] and other of a diabetes educator [SMS-DE]. The patient could send unlimited SMSs to both of them between the clinic visits. The main objective was to solve the problems of patients in anytime anywhere manner and give individualized care. Patients asked questions about sick days, travel days, hypo and hyper glycemia, dietary advice etc. the healthcare providers replied efficiently and solved their problems.

**Educational and Motivational Messaging Intervention**

Diabetes self-management education and support (DSME/S) provides the help to people with diabetes to make their decisions and do such activities which has shown improvement in health outcomes. “Diabetes self-management education (DSME) is the process of facilitating the knowledge, skill, and ability necessary for diabetes self-care. Diabetes self-management support (DSMS) refers to the support that is required for implementing and sustaining coping skills and behaviors needed to self-manage on an ongoing basis.” Several interventions were given which helped in imparting diabetes education to the patients.

Shetty et al,(2011) developed an intervention in which the intervention group received SMS once in 3 days as a reminder message to strictly adhere to dietary modification, physical activity and medication adherence. The messages consisted of instructions relate to medical nutrition therapy, physical activity and medication adherence. Messages on healthy living habits were also sent.

A uni-directional text message intervention was also developed by Arora et al (2012) in which the main focus was on increasing the motivation of patients along with increasing self-efficacy and their ability to adhere to self-care activities. The messages were categorized in four categories, first being the educational or motivational messages related to blood glucose control, healthy eating, foot care, heart care etc. messages like “Controlling your blood glucose, blood pressure, and cholesterol—can mean a longer and healthier life,” and “Eat more fruits, vegetables, beans, and whole grains and less salt and fat.” Second type medication reminder messages, third type of messages were categorized as healthy living challenges in which small challenges were given and fourth type is trivia messages which were in the form of questions and answers to increase the knowledge of patients and to engage them.
Goodarzi et al. (2012) conducted a similar study in which their main objective was to educate the patients about their disease via SMS feature of mobile phone. In this intervention 4 messages were sent per week containing information related to knowledge, attitude, behavior and self-efficacy in type 2 diabetes. In an intervention by Abbas et al. (2015), 5-7 educational messages were sent per week which covered the areas like general diabetes care knowledge like its signs and symptoms, diet related information, psychotherapy and latest new related to diabetes management. These messages were also considered as reminders for medication adherence self-monitoring of blood glucose.

Similarly, in an intervention conducted by Islam et al. in Bangladesh, over the period of 6 months 90 messages were sent. These messages were educational messages and the content was revolving around medication reminders, education of diabetes and its complication and raising awareness about dietary management and physical activity. The purpose was to measure the impact of SMS on newly diagnosed type 2 diabetes patients. In a recent intervention given by Dobson et al. (2015) to assess the usability and acceptability of SMS as a tool for properly managing poorly controlled diabetes, a program called SMS4BG was developed. This program was developed to help adults whose blood glucose was poorly controlled. In this intervention several modules were developed on different areas of diabetes management. The messages in different module ranged from 2-5 and were based on diabetes education, perception of illness, emotional encouragement to control blood glucose well. Also modules were covering the area of smoking cessation and other topics like diet and exercise. The patients got the option to choose one or more modules and receive messages base on their choice with the support of health care providers, is critical for successful outcomes, however, frequent clinical contact is costly. Text messages via short message service (SMS).

In a study conducted by Patnaik et al. (2015) stress management was done via text messages in type 2 diabetes patients. In this text messages related to stress management were sent to the patients.

**Outcome Measures**

Intervention length ranged from four weeks to two year, and, for all studies conducted data was collected at baseline and immediately after the intervention. Some studies included intermediate follow-up times, but none had long-term follow-up that extended beyond completion of the intervention. Mostly the studies were Randomized control study & Few studies were Pre-post.

Outcome measures were many but mainly there were 4 type of outcomes:

**Biochemical Measures**: it was utilized most as the indicator for success of the SMS based intervention. Change in Value of HbA1c from baseline to intervention period & variation between intervention group & control group. Change in HbA1c levels were measured in 19 studies (Fig. 2). In 19 studies difference in the mean percentage change of HbA1c before and after intervention in the intervention and control groups was the most observed parameter to measure the effect of intervention. The minimum and maximum difference reported in the intervention group was -0.41 and -1.7 respectively. Statistically significant decrease was observed in HbA1c levels in 12 studies. Seven studies did not show any significant decrease in mean HbA1c.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Mean Decrease in HbA1c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwon(2004)</td>
<td>-0.5</td>
</tr>
<tr>
<td>Kim(2007)</td>
<td>-1.15</td>
</tr>
<tr>
<td>Kim(2007)</td>
<td>-1.05</td>
</tr>
<tr>
<td>Yoon(2008)</td>
<td>-1.32</td>
</tr>
<tr>
<td>Arora(2012)</td>
<td>-1.05</td>
</tr>
<tr>
<td>Goodarzi(2012)</td>
<td>-0.89</td>
</tr>
<tr>
<td>Islam(2015)</td>
<td>-0.85</td>
</tr>
<tr>
<td>Fortmann(2017)</td>
<td>-1</td>
</tr>
<tr>
<td>Dobson(2018)</td>
<td>-0.8</td>
</tr>
<tr>
<td>Wargny(2018)</td>
<td>-0.3</td>
</tr>
</tbody>
</table>
Other biochemical parameters were Fasting & Post Prandial blood glucose24,34,35 Serum triglycerides23,41.

2. Compliance & adherence: Compliance to the intervention or to the Diabetes management regime was another parameter which was measured in many studies, stress level44 was also measured and managed in a study conducted by Patnaik et al(2015), adherence to diet and physical activity 49.

3. User satisfaction: Another important parameter which was measured was user satisfaction with the intervention, frequency of messages sent and the information sent through messages was assessed9,23,30,36,37,40,43,46,47,50–53.

4. Change in knowledge, practice & self-efficacy—many interventions apart from biochemical parameters also assessed change in the knowledge, practice or self-efficacy of the patients30,36,41,42,47,53,54.

Though mostly earlier studies shown positive impact of text message based intervention but many studies of later times did not show statistically significant result as far as HbA1c is concerned36,42,51–54, but those studies were acceptable when it comes to user satisfaction & behavior change.

Discussion

Maintaining healthy lifestyle in type 2 diabetes patients is fundamental for their healthy life. Mobile phone technology is found to be very useful in interventions where the target is changes in behavior and lifestyle, and are particularly associated with chronic diseases management. This study reviewed thirty-two studies that assessed the effect of interventions which uses SMS feature of mobile phone for the management of type 2 diabetes. It provides evidence that there is a significant effect of mobile technique on type 2 diabetes management.

The main contribution of the present review is that it provides the current state of mHealth based studies using SMS, and the findings are based on interventions given in different countries. Among the studies reviewed, randomized controlled design was the most applied study design. This design enhanced the comparability of the outcomes. Also, quantitative measures were used in most of the studies for key outcomes, which are HbA1c, blood glucose values, change in knowledge, practice & self-efficacy of patients. Several scales were used in many studies to measure the change in knowledge, attitude, behavior and self-efficacy, medication adherence & physical activity levels of the participants. Many interventions were checked for its feasibility and usability. User satisfaction with the intervention was also used in many studies.

Many healthcare providers and organizations are searching for cost-effective ways of providing high-quality healthcare to patients, and using mobile phones may prove to be one effective strategy. However, cost issue was mentioned in one of the studies9. The SMS technology is useful because mobile phone penetration is very high across the world especially in developing countries1. It is also evident that the technology is easy to use2. Now-a-days mobile phones are available which works in local languages too, it is even more helpful because that will curb the limitation of language faced by several patients55.

Despite the strengths of mobile phone technology in type 2 Diabetes management, there are some potential limitations which should be taken into consideration while interpreting the results. One is that many studies have small sample size and are pilot studies though showing positive results the same findings cannot be expected for the large population. Large studies are required to prove the positive outcomes more strongly.

Another drawback related to these studies is that the interventions are of not very long durations except some, which are of 1 year 34,35,39 & one intervention was of 2 year56 which did not show any significant result. Most interventions are of duration around 3 months and some are as short as four weeks30. Mobile based interventions are quite new in its origin and most studies are still in exploratory stage. Its potential needs to be exploited more with large scale studies and long duration interventions.

SMS based intervention relies heavily on the willingness of the participant, that is, it is working more towards the behavioral changes which bring several limitations to it. For mobile phone technology to be effective, continuous compliance and adherence is very important. It is essential for it to be very flexible keeping in view the requirements of the patients. In some studies it was found that type of intervention which was given
was difficult for patients to handle and additional training was required24,36.

Although new opportunities are promised by mobile phone technology to reach Type 2 diabetes patients anytime and anywhere, mobile health interventions may result in the exclusion of some populations like those who are illiterates or don’t have access to a mobile phone 2.

The current review paper is done by the authors in search for the relevant literatures. Some studies might have been missed due to limitations of search source. This limitation may lead to some selection bias. Further studies should be continued to confirm the findings.

Mobiles are advancing rapidly and are ubiquitously available at low cost overcoming the limitation of stationary computers to deliver information on demand with flexibility and convenience for people on the move2.

Overall the study results suggested that SMS may provide a simple, fast, efficient and low-cost adjunct to the medical management of diabetes at a distance.

**Conclusion**

The purpose of this review is to evaluate the contribution of SMS based intervention in the management of type 2 diabetes. In this review most studies were based on the utilization of SMS feature of mobile phone in communicating the healthcare information to individuals saving time and money and proper one to one based communication. SMS based information caters the need of personalized healthcare which is particularly required in chronic disease like diabetes. After reviewing the available data, it can be concluded that SMS based interventions are potential tool, for the management of Type 2 diabetes.

**Ethical Clearance**- Not Required

**Source of Funding**- Self

**Conflict of Interest**- Nil

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Research Paper

A Study on Quality of Life among Working and Non Working Married Women

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Abstract

The objective of the research study was aimed to examine the significant difference in the quality of life among non working married women and working married women. The motive of of studying about the non-working and working married women because of the leading unsuccessful, stressful, juggled life of the women post marriage. Both career women and homemakers have to perform many responsibilities which includes taking care of the household chores, family and office work. Quality of life scale by B.L Dubey were used in the research study and keeping in view the objective of the study, an empirical investigation was undertaken and thereafter data were formulated & evaluated by the T-test and ANOVA test The sample of the study consisted of 100 married women (50- career women and 50-homemakers). Their age ranged between 25-40 years and the research has been done in Delhi NCR. The study reported that working married women have a better quality of life as compared to non working married women.

Keywords: quality of life scale, non working married women, working married women

Introduction

The term personal satisfaction (QOL) references the general prosperity of people and social orders. The term is utilized in a wide scope of settings, including the fields of global improvement, medicinal services, and legislative issues. Personal satisfaction ought not be mistaken for the idea of way of life, which depends principally on salary. Rather, standard markers of the personal satisfaction incorporate riches and business, yet additionally the fabricated condition, physical and emotional well-being, instruction, amusement and recreation time, and social having a place. While Personal satisfaction (QOL) has for some time been an express or understood approach objective, satisfactory definition and estimation have been slippery. Differing “objective” and “emotional” pointers over a scope of controls and scales, and late work on abstract prosperity (SWB) reviews and the brain science of bliss have prodded intrigue. Likewise as often as possible related are ideas, for example, opportunity, human rights, and satisfaction. Nonetheless, since bliss is abstract and difficult to gauge, different measures are commonly given need. It has additionally been demonstrated that bliss, as much as it tends to be estimated, does not really increment correspondingly with the solace that outcomes from expanding salary. Subsequently, way of life ought not be taken to be a proportion of joy. Likewise in some cases considered related is the idea of human security, however the last might be considered at a progressively essential dimension, and for all people. The choice to drive is frequently a choice to offer need to business related qualities. In the event that suburbanites have been fruitful in accomplishing their work targets, they would anticipate that them should be more happy with their work life than double profession respondents who may have made vocation bargains (Green and Zenisek).
The driving way of life gives the chance to extraordinary focus and additional time at work by the partition of work and non-work life (Shelter and Vanderslice; Farris). Relationship, family life, and individual time fulfillment. Eye to eye association while living in a similar living arrangement is expected to encourage passionate closeness and lucidity in family life (Kirschner and Walum). The estimation of personal satisfaction (QOL) frames an imperative proportion of result, which is reliant on the abstract appraisal of a person’s wellbeing and prosperity (Wilkinson et al.,) and identifies with those parts of a person’s life that sway legitimately upon their wellbeing (Patrick and Erickson,.). The significance given to this vital proportion of psychosocial working can be best summed up by the World Wellbeing Association (WHO) as a “people’ impression of their situation in life with regards to the way of life and esteem frameworks in which they live and in connection to their objectives, desires, benchmarks and concerns” (The WHOQOL Gathering).

The term working couples has been first developed by Rapoport and Rapoport (1976), and refers to a particular sort of working couples in which the two individuals seek after an expert profession and want work-related improvement. Working couples, then again reflect more an essential as opposed to a desire to work. In other words, working couples work with a specific end goal to acquire a family wage and their inspirations are essentially determined by money related rewards as opposed to a requirement for self-satisfaction.

Aldous (1982), pointed out that utilizing the working couples phrasing would involve that women’s voluntary work in the household is not “genuine” work. In spite of the fact that the usage of the term dual earner has perceptible worth, the term working couple was used in this exploration Gorissen, (2009). Likewise distinguished four general kinds of working couples: accommodators, acrobats, opponents, and partners. These four kinds are described by either high or low inclusion with family and profession issues Hall (1980). Dual working workers find themselves in a consistent manipulating act to associate work and family request. To exacerbate the situation; the careers of both partners are exceptionally interrelated and working decisions and experiences of each accomplice are probably going to influence the other Parker and Arthur, (2004). His challenge for working couples is to coordinate two independent journeys and to to guarantee that each adds to the achievements of the other. The most every now and again referred to issues by working couples are work-family struggle division of work for family unit activities Greenhaus & Beutell, (1985). A female contribution and movement has improved working couples, the female need to keep up the work, family unit, and child care duties together, makes work and family part strain King, (2005).

Both partners of working couples may advantage from the status of „dual-workings,“ aside from the challenges experienced. A favorable benefit for such a family is an expanded way of life Green & Zenisek, (1983) because of the most prominent family wage through a twofold paycheck Gorissen, (2009). Lee (1980) set that working couples confront numerous issues as they have to assume an excessive number of roles with an excessive number of demands on time and vitality. Working couples find it a continuous juggling act to syndicate both family demands and work Gorissen, (2009), and therefore experience work-family struggle; a struggle in the relationship amongst family roles and work.

According to Shiju Joseph and Anand Inbanathan (2016), one of the foundational connections that has experienced considerable changes as of late in India is the bond between wedded couples. A concurrent change with extensive outcomes is the new found spotlight on profession among women. The interface of career and home has offered to meet people’s high expectations that impact the quality of the couple’s relationship. In this specific circumstance, the paper looks to comprehend the couple relationship of wedded experts from a sociological viewpoint in an Indian urban setting. The dual career couples circumstance outfits convincing proof of the expanding educational and career goals of women. A critical extent of these women in the workforce involves spouses and moms whose business status will request a huge change in their example of activities, duties and obligations, requiring a reassessment of the family condition Henry and Parthasarathy, (2010). Working couples likewise go up against everyday difficulties with respect to the household activity management, Anderson & Spruill, (1993). Household activities, for example cleaning, shopping, cooking, and doing laundry are generally done by the women in a
family. On the other hand, in working couples, females have less time to do these important exercises identified with the family Neault & Pickerell, (2005).  

**Review of Literature**

In quality of life, a significant difference found between working married women and non working married women because quality of life means having an interesting job to go, feeling safe, confident and happy with it, feeling close to the people who share with life, having fun and loving life, all these are important to be happy life. It is also meant to have the freedom to choose things people wish.

In a study examined by Bunker and Barbara B in 1992 in relation to the quality of life of couples in two types of dual-career families initially gave out the following results. Individuals belonging to the 90 commuting and 133 single residence dual career couples were distinguished on the basis of the factors of satisfaction and stress. Commuters were much more satisfied with their work life and with the time they had for themselves, and were dissatisfied with family life, with their partners relationships, and conclusively with life as a whole. The commuters did not report on experiencing a more stressful lifestyle than did the single - residence dual-career career respondents, and the commuters reported significantly less overload than the others.

There were no significant interactions of gender with dual-career family type of measures of either satisfaction or stress. Among commuters, there were no significant differences in self-reported satisfaction or stress among those who traveled and those who stayed at the primary residence, and there were no Commuter Role (traveler vs. non traveler) x Gender interactions. It was concluded that the commuting lifestyle can have both rewards and costs, and that in some ways single-residence dual-career lifestyle may be more stressful and dissatisfying. This study compared the quality of life in commuting couples and in dual-career couples who live together in a single residence. To examine the benefits and the costs of these two lifestyles, chose to focus on satisfaction and stress as quality of life indicators. Previous studies of commuting couples have not empirically compared commuter couples to other types of couples (Bunker & Vanderslice, 1982; Douvan & Pleck, 1978; Farris, 1978; Gerstel, 1977; Gerstel & Gross, 1981, 1984; Gross, 1980; Kirschner & Walum, 1978). Rather, the self-reported satisfactions and stresses of commuting couples have been accepted at face value without appropriate comparisons.

Brendan Fisher et al (2007) this article demonstrates that Enhancing Quality of Life (QOL) has long been an explicit or implicit goal for individuals, communities, nations, and the world. They relate QOL to the opportunities that are provided to meet human needs in the forms of built, human, social and natural capital in addition to time.

Rahman and Asaduzzaman (2008) an Author, examined the study was correlate between mental health and marital adjustment of middle class employed married women and housewives. The sample of the following research consists of middle class women. The data was collected by using dyadic adjustment scale of Spancer and General Health Questionnaire of Goldberg. The result indicated that the mental health of the employed married women was significantly higher. Moreover, marital adjustment of employment women was significantly higher than house-wives.

In a research conducted by Gani et al in 2010, it was studied that what were the causes, consequences, and correlates of working family conflicts among dual working women. By the results it was found that there were many factors which contributed in making the role conflict of working women a reality. It was seen that the phenomenon of marital adjustment was given.. marriage being a priority in all cultures, is one of the most important commitment of an individual made in his or her life. Marital adjustment has always been related to age, job status, type of marriage, place of stay and home stresses, mental illness, depression, education, sex role attitude, happiness, success in life and many other factors.

**Methodology**

**Aim**

The present research aim is to study the Quality of Life of Working and non working married women

**Hypotheses**

There will be a significant difference in the quality of life of working and non working married women.
There will be a significant difference in satisfactory and satisfying dimension of quality of life among working and non working married women

Sample

A total 100 Married women of 25-40 years age has been taken for the proposed study out of which 50 were working married women and 50 were non working married women. Respondents were taken from Delhi-NCR

Design

Considered the most appropriate method for this research was survey method. Questionnaires and the personal interview method were adopted to conduct the survey.

Instruments

SPSS tool and excel sheet were used. The Quality of Life scaleby B.L Dubey is a standardized tool used for measuring the extent of quality life among working married women and non working married women. The Quality of Life Questionnaire comprises of 25 (twenty five) extremely discriminating “Strongly Agree” “Agree” “Undecided” “Disagree” and “Strongly Disagree” kind of questionnaire were there to locate the quality of life of the respondents.

Procedure

In the study the researcher formed a good rapport before with the participant through personal interaction before filling up the questionnaire to make the participant comfortable. The data for working respondents was collected from private service organizations such as corporates, schools, banks and IT institutes of Delhi NCR and the data for non working respondents were contacted at their residence or at a general place and brief them regarding the research study. The respondents were asked to fill-up all the statements by following the instruction given in each of the questionnaire and were briefed about the objective of the study, its significance and importance of their responses in this study. After the completion of the questionnaire paper the participants were appraised for cooperation and help in the study.

Result and Discussion

In the initial step, mean and S.D., for every variable was put under measurable examination, at that point, higher statistical processes were begun in which, T-test & ANOVA were taken. Results are presented in the mentioned below tables. In comparison, significant difference was found.

<p>| Table. ANOVA scores of Quality of life Scale in non-working married women and working married women |
|---------------------------------|--------------------------------|-------|-----|-------|-----------------|</p>
<table>
<thead>
<tr>
<th>Variables</th>
<th>Dimensions</th>
<th>Quality of Life</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>P Value</th>
<th>Significant Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>NON WORKING MARRIED WOMEN</td>
<td>Satisfying</td>
<td>146.417</td>
<td>7</td>
<td>20.917</td>
<td></td>
<td></td>
<td>.008531</td>
</tr>
<tr>
<td>Wives</td>
<td>204.00</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>99.056</td>
<td>3</td>
<td>33.019</td>
<td>12.978</td>
<td>.049724</td>
<td>0.05*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satisfactory</td>
<td>153.167</td>
<td>5</td>
<td>30.633</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>252.22</td>
<td>8</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>45.136</td>
<td>3</td>
<td>15.045</td>
<td>4.358</td>
<td></td>
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</tr>
</tbody>
</table>
The data depict analysis of variance between non-working married women and working married women. All the dimensions (satisfying, satisfactory) of married women showing the p values and their significant level that indicating a significant difference between the working married women and non-working married women lying at 0.01 levels and 0.05 levels. Quality of life with working and non working women differs with each other and it depends not only upon wealth and employment, but also the built environment, physical and mental health, education, recreation and leisure time, and social belonging. The part of working women has changed all through the world because of financial conditions and social requests. This has brought about a situation in which working women have colossal strain to build up a career as strong as their male partners while managing dynamic engagement in individual life. Overall working women enjoying Quality of Life better than non-working women.

**Conclusion**

The present research determine: the study about the quality of life in working married women and non-working married women and there were two dimensions to analysis the quality of life, i.e., satisfying and satisfactory. This study portrays that working married women have a better quality of life and has a better lifestyle as compared to non working married women.

**Ethical Clearance** – This is a part of Supporting Ph.D research work and ethical committee wing is not applicable for this research.

*The result is significant at the 0.05 level

**The result is significant at the 0.01 level.

**Source of Funding**- This is not a funding research as this is an original research paper by the research scholar.

**Conflict of Interest**- Nil

**References**

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Management of a Mandibular Second Molar with a C Shaped Canal Using Canal Mapping and Continuous Wave of Condensation Techniques -A Case Report

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Abstract

Cone Beam Computed Tomography has proven to be an indispensable tool in Endodontics in recent times. The three dimensional visualization has aided in predictable management of teeth with complex canal anatomy. In this case report, a non-vital mandibular second molar with a C-shaped canal configuration was subjected to CBCT analysis. The images were then used to create 2-D and 3-D canal mapping for a meticulous reproduction of the canal intricacies. After canal instrumentation, thermoplasticized obturation was done using Continuous wave of condensation technique. This case report stresses on the importance of contemporary technology for precision in dentistry.

This case report demonstrates the value of CBCT, 2-D and 3-D canal mapping as well as Continuous Wave of Condensation technique of obturation in the management of teeth with C-shaped canal configuration.

The purpose was to describe a standardized and precise method of mapping the complicated C-shaped canal anatomy using CBCT. This also highlights the importance of Continuous wave technique of obturation as a predictable technique to three-dimensionally seal the C-shaped canal system.

Keywords: Cone Beam Computed Tomography Shaped canals, Continuous wave of condensation.

Introduction

Complete filling of root canals after shaping and cleaning procedures is the main objective of root canal therapy. Successful endodontic treatment needs proper knowledge about aberrant root canal systems. The root canal anatomy has been studied for a long time now. One of the first pieces of work was done by Hess and Zucker way back in 1925 called ‘The anatomies of the root canals of the teeth of the permanent and deciduous dentition’. We have come a long way since then in terms of knowledge and the technologies available to study this small intriguing space. C-shaped configuration is one of the most important anatomic variations of the root canal system.

C-shaped canal morphology, which was first documented in endodontic literature by Cooke and Cox in 1979, has been reported with an incidence rate of 2.7% to 44.5% in mandibular second molars. The instrumentation and obturation of these canal spaces is always a challenge. Melton first classified C-shaped canals in 1991. Fan later modified this classification in 2004. Fan provided two classifications, namely the anatomic and the radiographic classification. Yhe incidence is rare in white populations and is common in mandibular second molars of Chinese and Lebanese populations. One interesting fact is that the presence of a C-shaped configuration in a tooth is accompanied...
by a contralateral occurrence with a high percentage of around 70%.  

**Case Report**

In this case report, a female patient, aged 40 years, reported to the department of Conservative Dentistry and Endodontics with pain in the lower left back tooth region. On examination, deep Class V caries was observed with respect to the lower left second molar (LL7). IOPA revealed radiolucency involving the pulp. Pulp vitality testing revealed no response to cold test, heat test and a delayed response to EPT.

Based on the history and clinical findings, a diagnosis of symptomatic apical periodontitis associated with pulp necrosis was inferred. Access opening was done and a C-shaped canal was detected. A CBCT was advised to plan the further treatment. CBCT revealed a C-shaped canal configuration which had a distobuccal apical exit. This was a C1 configuration according to Fan’s classification with a single C-shaped canal from the orifice exiting through single buccally placed apical foramen. A detailed examination of the CBCT was done and a schematic diagram of the root canal space was made to create a 2D canal map for better visualization of the canal anatomy at various cross-sectional levels (Fig 1). The CBCT image was then subjected to digital coloring of the root canal space (Planmeca Oy, Helsinki, Finland) in order to create a detailed image of the extensions of the root canal. This visualization of the volume and marginal extensions of the canal by CBCT 3D mapping (Fig 2), was of enormous help in tackling the variations within the canal space during the obturation phase. It made the obturation more predictable and accurate as compared to random application of pressure during the vertical compaction of thermoplasticized gutta-percha.

Root canal instrumentation was done along with copious irrigation using a combination of saline and sodium hypochlorite over two appointments using iRaCe system (FKG Dentaire, LaChaux-de-Fonds, SA, Switzerland). Obturation was done with the Continuous wave obturation technique using the Elements obturation unit (Sybron Endo, USA). The canal was coated with Bioroot RCS sealer (Septodont, USA) and a size 35/.04 taper master gutta-percha cone (Dentsply Maillefer, Ballaigues, Switzerland) was inserted into the canal till full working length.

A prefitted Buchanan heated plugger (Kerr Dental, USA) attached to the Elements obturation unit was driven smoothly through the Gutta percha, to within 5 mm of the binding point. After releasing the switch, firm apical pressure was applied for 5 seconds to prevent cooling shrinkage. One second of separation burst was applied after which, the electric plugger was withdrawn. This completed the down pack. The thermoplasticized Gutta percha was injected in 2 phases of 4- to 5-mm thick layers, into the root canal space during the backfilling using the Elements obturation unit. Pre fitted Buchanan hand pluggers (Kerr Dental, USA) were then used to pack the apical gutta-percha plug as well as the following layers of thermoplasticized gutta-percha. Heated gutta-percha was compacted with a Buchanan hand plugger size 1 at the first phase and size 2 at the second phase. The access cavity was then sealed off with composite (3M ESPE, USA) in preparation for the subsequent crown.
FIG 1: 2D Reproduction of the canal space.

FIG 2A and 2B: 3D rendering of the c-shaped Canal.

FIG 2B: 3D rendering of the c-shaped Canal.

FIG 3A: Pre operative-Axial section of coronal third of the canal (7.5 mm from the apex).

FIG 3B: Post operative-Axial section of coronal third of the canal (7.5 mm from the apex).

FIG 4A: Pre operative-Axial section of middle third of the canal (5 mm from the apex).

FIG 4B: Post operative-Axial section of middle third of the canal (5 mm from the apex).
Discussion

There are several ways to obturate root canals. The lateral compaction technique is the most commonly used technique. Despite the fact that a large number of accessory gutta-percha cones are used in C-shaped canals, it has been reported that their radiographic appearance has less density than normal root canals. The gutta-percha does not fill the narrow connecting areas of the C-shaped canal system. Heat softened solid core carriers are quite effective but unpredictable and a single obturator is often unable to fill the canal completely, creating the need for more than one obturator. The injectable cold filling method consists of a gutta-percha and sealer combination in an injectable system, which has cold, fluid, and self-curing filling material. These are more useful as sealers than as stand-alone obturation solutions for total filling of the root canal spaces. In the present case, Continuous wave of condensation technique has been employed using Elements obturation unit.

The continuous wave of condensation technique was introduced in 1987 by Buchanan with an aim to simplify obturation. In this technique, one single pre fitted heated plugger is used to shear off Gutta-percha up to 5mm from the apex during down-pack, followed by back fill with thermoplasticized Gutta percha. Buchanan hand pluggers of larger sizes are then used to further condense the softened Gutta percha and create a dense pack. The application of heat and apical pressure to a well-adapted master gutta-percha cone will also create hydraulic pressure within the canal. The hydraulic pressure created, will in turn move the heated gutta-percha and sealer apically and laterally to further seal canal irregularities.

Previous studies have shown that thermoplasticized gutta-percha is more appropriate for filling root canal abnormalities, but in C-shaped canals, divergent areas that are frequently unshaped may show resistance to obturation material flow. This particular disadvantage can be overcome by the continuous wave of condensation technique used in this case report by vertically compacting the warm plasticized gutta-percha into the narrow spaces within the root canal system.

Summary

The challenges that are typically faced when treating C-shaped canals have been addressed in this case report. The mystery of the canal variations has been unraveled for a more predictable treatment plan. The short comings of only using thermoplasticized gutta-percha is that in C-shaped canals, divergent areas that are narrow and difficult to access will show resistance to flow of the obturation material. Continuous wave of condensation technique helps overcome this. The ability of the clinician to understand the complexities of the clinical cases and usage of the latest available equipment will always result in optimal results.

Conflict of Interest- Nil

Ethical Clearance– Taken from Institutional
Ethical Committee

**Source of Funding** - Self

**References**

Work Place Health Promotion among Supporting Staff with Hypertension and/or Type 2 Diabetes Mellitus at Rajya Vokkaligara Sangha, Bengaluru

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1Pharm-D, 2Professor, Visveswarapura Institute of Pharmaceutical Sciences, 22nd Cross Road, Siddana Layout, Banashankari Stage II, Basvangudi, Bengaluru, Karnataka

Abstract

Introduction: Workplace health promotion is defined as prevention, minimization and elimination of health hazards and also maintaining, promoting working ability. Diabetes mellitus and Hypertension are chronic health illness which is increasingly becoming a major health issue in the present society. It is often reported that only half of the patients with chronic conditions adhere to the medications properly. It requires patient education to accomplish adequate control and avoid adverse health consequences.

Objectives: To promote health at workplace by improving medication adherence for Supporting staff with history of hypertension and Type 2 diabetes mellitus by counselling aided Patient information leaflet.

Methodology: A prospective interventional study was conducted among the supporting staff of Rajya Vokkaligara Sangha, Bengaluru for a period of 6 months. A total of 26 patients, were enrolled based on the inclusion criteria. Their blood pressure and random blood sugar level was measured in each follow-up. Four follow-ups were conducted every 15 days once. The patients were interviewed using MARS and were counselled. Obtained data was entered into MS Excel sheet and analysed. The statistical analysis was done using Chi square test with p<0.05.

Results: It was found that adherence level was low in the case of test group MARS scale presented only 30.76% of subjects were adherent. Fourth follow-up showed 83.33% of increased adherence level. Chi-square test value was 0.0016 (p<0.05) results statistically proved that there is significant difference in the adherence level between the follow-up. By the end of the study, there was a significant decrease in mean SBP, mean DBP; and RBS levels.

Conclusion: Thereby, by educating the participants about their understanding of the illness, importance of adhering to the medications, lifestyle modifications and dietary recommendation, there will be gradual increase in the adherence rate.

Keywords: Hypertension, type 2 diabetes mellitus, counselling, patient information leaflet.

Introduction

Health promotion in the workplace is defined as prevention, minimization and elimination of health hazards and also maintaining, promoting working ability of an individual. Illness at workplace can result in declined work rate which originates from two factors absenteeism and presenteeism. Health promoting activities at workplace directly correlates with the employee’s health augmentation, and decline in the health care cost. Rising rate of chronic diseases eventually combined with an aging workforce is making health promotional activities prioritizing, in any
organizational setup.

Chronic health diseases are enormously rising across all age groups, adding enormous burden to already high costs of health care. Older workers typically suffer from chronic disease conditions and have multiple health risks. Diabetes and hypertension are the highest burden of non-communicable diseases to the populations worldwide. According to WHO patients in low income and middle-income countries experience higher rate of morbidity from non-communicable diseases. As estimate 366 million and 1 billion people globally are living with diabetes and hypertension respectively. By 2020 prevalence of these diseases is expected to increase in between 13 and 30%.

Adherence to treatment, healthy lifestyle, physical activities, smoking, diet, and salt intake are important factors for effective management of chronic diseases. Different tools have been used to assess adherence and there is no particular gold standard to measure adherence. Standardized and self-reported questionnaires have frequently been used because they are low in both cost and time expenditure.

Patient counselling is also one of the strategic methods to improve adherence. One of the counselling aid is by providing information leaflet’s which explains illness, signs and symptoms, and further complications risk factors, and required lifestyle modifications. Counselling enhances patient understanding about illness, and also about using medications, nutritional diet to be followed accordingly all together put in place results in better therapeutic outcome and increased in quality of life.

Materials and Method

STUDY SITE

Prospective interventional study was conducted in the five different organizations of Rajya Vokkaligara Sangha, Bengaluru for a period of six months from November to April 2017-18. The study was approved by the institutional ethics committee Committee of Visveswarapura Institute of Pharmaceutical Sciences (VIPS), Rajya Vokkaligara Sangha, Bengaluru – 70.

STUDY POPULATION

INCLUSION CRITERIA; Supporting staff with a history of Hypertension and/or Type 2 diabetes mellitus for more than 6 months and on medication, aged above 40 years, either sex with no other co-morbidities and complications. He/she should be working as a full-time employee of Rajya Vokkaligara Sangha Bangalore.

EXCLUSION CRITERIA: Supporting staff who are newly diagnosed with hypertension and/or Type 2 diabetes mellitus and are less than 40 years of age and also who are not willing to give informed consent. Gestational diabetes and drug induced diabetic.

STUDY DESIGN

All the study subjects were the supporting staff working Rajya Vokkaligara Sangha were included based on inclusion criteria and they were considered as test group. The patient’s demographic were recorded in a self-designed data collection which includes information regarding their medications, past medication history and their family history, then respective tests were conducted accordingly to their diagnosis. Blood pressure was measured using standard sphygmomanometer and random blood sugar was measured using a high quality glucometer. The test group, during their first follow-up were counselled with a health information leaflet based on their diagnosis. Study population were explained about their chronic condition, signs and symptoms; its risk factors, complications, and life style modifications, essential dietary changes required, rationality of drug use that are essential for their condition and also according to their work schedule. The counselling was done in the local/native language. Each follow up was done once in every 15 days for two months. In each follow-up staff were counselled with further life style changes required for their condition keeping their previous counselling facts into consideration. MARS scale was provided in each follow-up to observe changes in their medication adherence level, and also to evaluate the impact of counselling influences participant’s medication adherence level and augments their health at work place.

STUDY INSTRUMENT

MEDICATION ADHERENCE RATING SCALE (MARS)

Standard medication adherence scale MARS was given to the study participant. Permission was taken for using the MARS SCALE. This scale is based on two already existing self-report measures of compliance. The first is the Drug Attitude Inventory (DAI) and the second
is the Medication Adherence Questionnaire (MAQ). These compliance measures have been combined to produce a compliance scale.

The MARS consists of 10 items that require yes/no responses. Score classified as adherent ranging from 6 to 10 scale points and as non-adherent ranging from 0-5 scale points.

**Statistical Analysis**

Collected data was entered in Microsoft Excel sheet and was analysed. Chi-square test was applied to prove statistical significance between the follow

### Results

Study included total number of 26 participant’s and their mean age 50.6 years out of which 65.38 % were males and 34.61 % were females. Study population were distributed based on their age and they were categorized into five different groups [Table1]. Study population were also distributed based on their educational status, diagnosis [table2]. Adherence level was low in the case of test group, 47.05% of study population falls under the blood pressure range of 140-159/90-99 mmHg, 35.29%, 17.64%, of study population falls under the range of >160/100 mmHg, 120-139/80-89 mmHg according to the JNC-7 classification, whereas about 73.33%, 26.66% of population showed random blood sugar value more > 200, < 200 mg/dl. MARS presented only 69.23 % of subjects where adherent to the medication.

In first follow-up 52.94% of population falls under the blood pressure range of 140-159/90-99 mmHg and 35.29%, 17.64%, of study population falls under the range of >160/100 mmHg, 120-139/80-89 mmHg. Study group under the category of RBS was 60%, and remaining 40 % of population displayed RBS value <200 mg/dl. MARS presented only 40% of subjects where adherent to the medication.

During second follow-up 47.05% of study population falls under the blood pressure range of 140-159/90-99 mmHg. There was significant decrease when compared to the first follow-up, 35.29%, 17.64% of study population drop down under the grouping of 120-139/80-89 mmHg, >160/100 mmHg. Study population under the sort of RBS value >200 mg/dl, <200 mg/dl was 53.64%, 38.47%. Based on the following results there was significant increase in the rate of adherence percentage i.e. 58.33% among when compared to the first follow-up.

Third follow-up 23.52% of population were under category of blood pressure category of 160/100 mmHg and 35.29%, 41.17% of population slope down under the blood pressure range of 140-159 mmHg, 120-139/90-99 mmHg. There was significant increase in the fraction, 75% of population having their of random blood sugar value under 200 mg/dl. In the case of third follow-up adherent percentage was significantly amplified i.e. 73.91% when compared to the first, second follow-up.

In the last follow-up there was significant decrease in blood pressure value and study population under the blood pressure range of 160/100 mmHg was decreased to 5.88% and 47.05%, 41.17%, 5.88% of study population were considered under the blood pressure range of 140-159/90-99 mmHg. Subjects underneath the category of <200 mg/dl, 200 mg/dl were 76.94%, 23.07%. In fourth follow-up 83.33% of subjects were adherent.

Data was entered in Microsoft Excel sheet and it was analysed. Descriptive analysis used to describe demographic details, disease characteristics and their medication adherent scores. Percentages and graphical representations were used to describe categorical variables such as demographic details, disease characteristics.

Chi-square test value was 0.0016 which was less than p<0.05 these results statistically proved that there was statistically significant difference in the adherence level between the four follow-ups. There was also graphically significant variation in mean systolic, mean diastolic, mean random blood sugar in among each follow-up. [Figure 1, figure 2, figure 3].

This proves that counselling the subjects regarding their chronic illness and suggesting lifestyle modifications to them based on their values of blood pressure and random blood sugar and also providing patient information leaflet to the study population has resulted in positive impact in increasing their adherence level, maintaining healthy life style and also helped in improving their health at work place.
Table 1: Distribution of study population based on age

<table>
<thead>
<tr>
<th>AGE RANGE</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-44</td>
<td>7.69</td>
</tr>
<tr>
<td>45-49</td>
<td>11.53</td>
</tr>
<tr>
<td>50-54</td>
<td>38.46</td>
</tr>
<tr>
<td>55-59</td>
<td>38.46</td>
</tr>
<tr>
<td>60-64</td>
<td>3.84</td>
</tr>
</tbody>
</table>

Table 2: Distribution of study population based on their educational status and diagnosis.

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Percentage (%)</th>
<th>Diagnosis</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School</td>
<td>50</td>
<td>Hypertension</td>
<td>42.3</td>
</tr>
<tr>
<td>Pre-university</td>
<td>11.53</td>
<td>Type 2 DM</td>
<td>34.61</td>
</tr>
<tr>
<td>Graduate</td>
<td>38.46</td>
<td>Both</td>
<td>23.07</td>
</tr>
</tbody>
</table>

Table 3: Different reasons explained by study population for non-adherence.

<table>
<thead>
<tr>
<th>Reasons</th>
<th>No. of Patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgetfulness</td>
<td>10</td>
<td>38.46</td>
</tr>
<tr>
<td>Polypharmacy</td>
<td>4</td>
<td>15.38</td>
</tr>
<tr>
<td>Poor knowledge about hypertension and its complications</td>
<td>12</td>
<td>70.58</td>
</tr>
<tr>
<td>Poor knowledge about diabetes mellitus and its complications</td>
<td>11</td>
<td>73.33</td>
</tr>
<tr>
<td>Number of study population un-aware of previous values (BP, RBS, both)</td>
<td>18</td>
<td>69.23</td>
</tr>
<tr>
<td>Medicine is a key to control blood pressure and RBS</td>
<td>20</td>
<td>76.92</td>
</tr>
<tr>
<td>Being careless about their medications assuming blood pressure is in control</td>
<td>11</td>
<td>64.7</td>
</tr>
<tr>
<td>Being careless about their medications assuming that their blood sugar is in Control</td>
<td>9</td>
<td>60</td>
</tr>
<tr>
<td>Unaware of lifestyle modifications which helps to maintain adequate control of Blood pressure and/or Random blood sugar levels.</td>
<td>20</td>
<td>76.92</td>
</tr>
<tr>
<td>Unrestricted meal habits</td>
<td>7</td>
<td>26.92</td>
</tr>
</tbody>
</table>

Figure 1, 2, 3: Bar histogram showing mean systolic, mean diastolic, mean rbs in each follow-up.
Discussion

Two strategies were used for counselling the participant’s – one was using a patient information leaflet and other was using visual power point presentations. In the first three follow-ups they were counselled using a patient information leaflet. In the last follow-up presentations was done on hypertension and/or Type 2 diabetes mellitus because pictorial representations will have greater impact on participant’s and assist them to comprehend their condition in better way and also aids them to know the importance of life style modification in these chronic illness.

Among the study population 65.4% were males and 34.6% were females; indicating that hypertension and/or Type 2 diabetes mellitus affect both the gender, and considerably s male population being affected to a higher extent. In the study, adherence and strategies to improve medication adherence were identified as key factors for the medication management of hypertension and Type 2 diabetes mellitus. The different reasons behind the non-adherence was explained by participants [table 3].

Factors associated with non-adherence was evaluated in the test group factors such as age, gender, educational status, social habits were co-related with non-adherence. In the study 40-44 years, 60-64 years of study population showed (100%) of non-adherence to medications, 45-49 years, 50-54 years, 55-59 years of age group showed non-adherence percentage of 66.6%, 60%, 70%. Based on above outcomes, age can also be considered one of the non-adherence both can be co-related vice versa.

Gender was co-related to evaluate the factor of non-adherence in study the females were more adherent to their medications when compared to males. Male population bared 76.47% of non-adherence to the medications when compared to the female population. In comparison with the study conducted by Co-relating the educational status to evaluate the factor for non-adherence, the percentage of population completed 10th standard or below had non-adherence level of 77%, 100% of non-adherence seen in participant’s who completed pre-university and 60% of non-adherence was seen in staff who were graduates. Graduates have significantly high medication adherence level when compared to school or pre-university. According to above outcomes educational status can also be considered as one of the factor of non-adherence.

The existing scale measures medication adherence to a specific medication. However, patients with hypertension and/or type 2 diabetes mellitus are often treated with more than one medication. Therefore, to investigate medication adherence, the scale must be simple, validated, reliable and easy for the implementation as it has to be repeated for each medication. Medication Adherence Report Scale (MARS -10) questionnaire was utilised for its ease of application. The MARS – 10 was developed by Hogan et al. and has been widely used in different studies on a variety of chronic illness like type 2 diabetes mellitus, hypertension and chronic obstructive pulmonary disorder (COPD). There were two drop-outs in the study. Our study examined the impact of Workplace health promotion on BP and Type 2 DM among the raiya vokkaligara sangha employees. Overall the mean SBP and mean DBP and mean RBS was improved in every follow up and these findings were clinically significant. This improvement could be contributed by individualized lifestyle counselling that managed to increase awareness and positive lifestyle changes (diet and physical activity) in the control of HTN and type 2DM.
Conclusion

Study the population were educated about Hypertension and/or Type 2 Diabetes mellitus by expending health information leaflet and also they were explained regarding importance of adhering to medications, lifestyle changes, and dietary recommendations required based on their work environment to improve their quality of life at workplace. Medication adherence level were evaluated in each follow up based on MARS. Our study proven that there is a significant increase in the medication adherence level from first to fourth follow up. In conclusion “healthier workforce can be a safer workforce, a safer workforce can be a healthier workforce”.

Conflict of Interest: There are no conflicts of interest.

Financial support and sponsorship: Nil

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3. Atinga R, Yarney L, Gavu N. Factors influencing long-term medication non-adherence among diabetes and hypertensive patients in Ghana: A qualitative s
Relationship between Dental Anxiety, Oral Health Related Quality of Life and Oral Health Status of Indian Coast Guard Personnel in Mangalore, Karnataka

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Abstract

Background: Dental anxiety implies feelings of uneasiness, anxiousness and fear on thinking about dentistry and dental treatment situations. Oral Health-Related Quality of Life (OHRQoL) assesses the impact that oral diseases might have on the overall quality of life of individuals. It is a crucial aid in treatment planning and also for assessment of interventions. Literature regarding oral health status of Coast Guard personnel in India is scarce with almost no studies regarding their dental anxiety and OHRQoL.

Objectives: To assess the relationship between Dental Anxiety, OHRQoL and Oral Health Status of Indian coast guard personnel in Mangalore, Karnataka.

Method: A cross-sectional study was carried out among coast guard personnel in Mangalore. Dental Anxiety Questionnaire (DAQ) and 14-item Oral Health Impact Profile (OHIP-14) were employed to assess dental anxiety and OHRQoL respectively. WHO Oral Health Assessment Form was employed for assessment of oral health status of participants.

Results: Findings showed that participants had poor oral hygiene with a dental caries prevalence of 62.9%, and periodontal disease prevalence of 81.9%. About 72% of the participants had low dental anxiety while visiting a dentist and almost all the participants reported good OHRQoL. OHRQoL and dental anxiety or oral health status showed no statistically significant association (p >0.05).

Conclusions: The findings showed that the overall oral health status of Coast Guard personnel were relatively poor with high treatment needs.

Keywords: Coast Guard, dental anxiety, oral health status, quality of life.

Introduction

Feelings of uneasiness, anxiousness and fear when individuals think about dentistry and dental treatment situations is encompassed by the term dental anxiety. This anxiety might be one of the major determinants of poor oral health and might lead to individuals avoiding visiting dentists.¹ Investigators are now employing certain indicators for assessment and comparison of various oral health related issues in individuals and populations. One such indicator is Oral health-related quality of life (OHRQoL), which is now often being described in the literature.² Researchers have also demonstrated the close relationship between dental anxiety and low OHRQoL scores in populations.²³
An important characteristic of health-related quality of life is that it reflects the patient’s perspectives about the impact of health-related problems. OHRQoL has been defined as “A multidimensional construct that reflects (among other things) people’s comfort when eating, sleeping, and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health”.  

Coast Guards are entrusted with the responsibility of security along the coast-lines of a nation. The Indian Coast Guard is entrusted with control over the territorial waters of India and it safeguards India’s naval interests and administers naval law. They are an integral part of a nation’s defense forces and are assigned various security operations and missions. As designated by the Secretary of Homeland Security, they are permitted to carry firearms on them and can arrest miscreants to ensure appropriate enforcement of the law of the land.  

Protecting the health of the armed forces is one of the critical aspects of any society. Mapping the oral disease burden in this community is fundamental for prevention and control of oral diseases among them. This information is essential for determining priorities and planning oral health programs. Literature regarding oral health status of Coast Guard personnel in India is scarce, especially regarding their dental anxiety and OHRQoL.  

**Material and Method**

The present study was undertaken to determine the relationship between dental anxiety, oral health status and OHRQoL among Indian coast guard personnel in Mangalore, Karnataka. A cross-sectional, descriptive study design was employed in the present study. Mangalore is the District headquarters, with a Commander of district (DIG rank), Executive officers (commandant rank), Technical officers (commandant rank), District operational officers (commandant rank), District work officers (deputy commandant rank), District medical officer (lieutenant rank from Indian navy) and District logistic officers (assistant lieutenant rank). All the 277 personnel in the District Headquarters at Mangalore were included in the study.  

Inclusion criteria included all Indian Coast guard personnel presently working at District Headquarters, Mangalore and willing to sign informed consent form. Ethical approval was obtained from the Institutional Ethics Committee (IEC) of MCODS, Mangalore, following which the protocol was submitted to the University for approval. Calibration was done and kappa value was found to be 0.94 indicating good agreement.  

The study was conducted at the Office of the Indian Coast Guard at Panambur and at coast guard ships (leaving from Mangalore port), 20 kilometers from Mangalore city. Data collection was done using questionnaires and an oral examination. Demographic details, medical history and dental attendance patterns of the study subjects were obtained using an interview schedule.  

The following instruments were used for collection of data. The Dental Anxiety Questionnaire (DAQ) was employed to assess dental anxiety among respondents. OHRQoL was measured by employing the 14-item Oral Health Impact Profile (OHIP-14). The WHO Oral Health Assessment Form was employed for measuring oral health status of respondents.  

**Results**

A total of 277 coast guard personnel in the city of Mangalore were included in the present study. There were 84 personnel (30.3%) belonged to the rank of commander, 14 were (5.1%) chief commander ranked officers, 165 (59.6%) were officers, 12 (4.3%) were lieutenant and 2 were (0.7%) DGO/IG ranked officers.  

Oral health examination was undertaken for all participants, followed by administration of questionnaire on dental anxiety and OHRQoL. A total of 108 (39%) personnel reported they have been working for less than 5 years, 70 (25.3%) of them reported to have worked for 5-10 years, while 97 (35%) reported that they are working for more than 10 years.  

Overall, 188 (67%) have reported to having mixed diet and a majority of 277 participants (99.2%) used toothbrush as the main aid for brushing, while 1 (0.4%) person reported to use neem and finger for brushing. When the participants were asked about their brushing patterns, 207 (74.7%) of them reported to have used the combination of horizontal and vertical strokes during brushing.  

A total of 60 (21.7%) respondents reported smoking while 216 (78%) were non-smokers. Overall, 3 (5%) participants have reported of having smokeless tobacco.
A total of 21 (7.6%) reported to have positive history of tobacco chewing. A total of 202 (72.2%) of the participants reported as having no fear while dentist visit, whereas 38 (13.7%) of them reported experiencing a little fear while seeing a dentist. It was observed that 37 (13.3%) participants experienced a little fear to very much fearful while visiting dentists. While examining the temporomandibular joint, 2 (0.7%) participants reported symptoms of TMJ.

Overall, diffuse and hypoplasia of the enamel was observed in 4 (1.1%) participants while diffuse type of enamel hypoplasia was seen in 1 (0.4%) participant. Mean OHIP among the respondents of the present study was found to be 3.69 (SD=0.45). Distribution of OHRQoL scores revealed that 86 (31%) respondents very often found it difficult to relax due to oral health problem. A total of 2 respondents reported that they felt embarrassed due to oral health problem very often (table no 1). Regarding CPI scores, 50 (18.1%) participants were healthy individuals, while 12 (4%) had bleeding on probing and 155 (56%) participants had calculus. Shallow pocket depth (4-5mm) were seen in 48 (17.3%) respondents had while 13 (4.7%) respondents had pocket depth of 6-8mm (table no 4). Overall, 3 (1.1%) participants had very mild form of fluorosis while 9 (3.2%) had mild fluorosis.

The mean decay was found as 1.54 while number of mean missing teeth was 0.877 and mean filled teeth was found to be 0.61 . There was no statistically significant association between OHRQoL and dental anxiety among the respondents (p= -0.41). Results also indicated that there was no statistically significant association between DMFT and OHIP of participants (p= 0.995). Similarly, there was no statistically significant association between DMFT and dental anxiety (p=0.13) (table no 2).

### Table no 1: Distribution of Oral Health Impact Profile questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Very often</th>
<th>Often</th>
<th>Occasionally</th>
<th>Hardly ever</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble pronouncing words</td>
<td>14 (5.1)</td>
<td>07 (2.7)</td>
<td>09 (3.4)</td>
<td>86 (31.0)</td>
<td>161 (57.8)</td>
</tr>
<tr>
<td>Felt that your sense of taste has worsened</td>
<td>07 (2.7)</td>
<td>04 (1.4)</td>
<td>17 (6.1)</td>
<td>27 (9.8)</td>
<td>222 (80.0)</td>
</tr>
<tr>
<td>Had painful aching in your mouth</td>
<td>07(2.7)</td>
<td>09 (3.1)</td>
<td>08 (2.9)</td>
<td>03 (1.1)</td>
<td>250 (90.2)</td>
</tr>
<tr>
<td>Found it uncomfortable to eat any foods</td>
<td>17(6.1)</td>
<td>47 (17.0)</td>
<td>4 (1.1)</td>
<td>41 (14.8)</td>
<td>160 (61.0)</td>
</tr>
<tr>
<td>Been self-conscious</td>
<td>11 (4.8)</td>
<td>10 (2.7)</td>
<td>12 (4.7)</td>
<td>83 (30.0)</td>
<td>161 (57.8)</td>
</tr>
<tr>
<td>Felt tense</td>
<td>04 (1.4)</td>
<td>07 (2.7)</td>
<td>27 (7.1)</td>
<td>24 (8.8)</td>
<td>225 (81.0)</td>
</tr>
<tr>
<td>Had an unsatisfactory diet</td>
<td>07 (2.7)</td>
<td>09 (3.1)</td>
<td>08 (2.9)</td>
<td>03 (1.1)</td>
<td>250 (90.2)</td>
</tr>
<tr>
<td>Had to interrupt meals</td>
<td>17 (6.1)</td>
<td>47 (17.0)</td>
<td>04 (1.1)</td>
<td>41 (14.8)</td>
<td>160 (61.0)</td>
</tr>
<tr>
<td>Found it difficult to relax</td>
<td>86 (31.0)</td>
<td>27 (9.8)</td>
<td>42 (15.1)</td>
<td>47 (17.0)</td>
<td>75 (28.2)</td>
</tr>
<tr>
<td>Been embarrassed</td>
<td>02 (0.6)</td>
<td>04 (1.3)</td>
<td>57 (21.4)</td>
<td>11 (4.0)</td>
<td>202 (72.7)</td>
</tr>
<tr>
<td>Been a bit irritable with other people</td>
<td>04 (1.3)</td>
<td>02 (0.6)</td>
<td>02 (0.6)</td>
<td>13 (4.6)</td>
<td>256 (92.4)</td>
</tr>
<tr>
<td>Had difficulty doing your other jobs</td>
<td>11 (4.8)</td>
<td>10 (2.7)</td>
<td>12 (4.7)</td>
<td>83 (30.0)</td>
<td>161 (57.8)</td>
</tr>
<tr>
<td>Felt that life in general was less satisfying</td>
<td>04 (1.4)</td>
<td>07 (2.7)</td>
<td>27 (7.1)</td>
<td>24 (8.8)</td>
<td>225 (81.0)</td>
</tr>
<tr>
<td>Been totally unable to function</td>
<td>17 (6.1)</td>
<td>47 (17.0)</td>
<td>04 (1.1)</td>
<td>41 (14.8)</td>
<td>160 (61.0)</td>
</tr>
</tbody>
</table>
Table no 2: Correlation between OHIP, Job Designation, Work Experience DMFT AND Dental anxiety among participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>OHIP R</th>
<th>OHIP P value</th>
<th>Job Designation R</th>
<th>Job Designation P value</th>
<th>Work Experience R</th>
<th>Work Experience P value</th>
<th>DAQ R</th>
<th>DAQ P value</th>
<th>CPI R</th>
<th>CPI P value</th>
<th>DMFT R</th>
<th>DMFT P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHIP</td>
<td>1</td>
<td>.082</td>
<td>-.019</td>
<td>-.041</td>
<td>-.104</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.176</td>
<td>.750</td>
<td>.496</td>
<td>.084</td>
<td>.995</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Job Designation</td>
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<td>1</td>
<td>.086</td>
<td>-.008</td>
<td>.043</td>
<td>.044</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>.176</td>
<td>.156</td>
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<td>.471</td>
<td>.470</td>
<td></td>
<td></td>
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<tr>
<td>Work Experience</td>
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<td>.086</td>
<td>1</td>
<td>.221**</td>
<td>-.031</td>
<td>.128*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>.033</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>DAQ</td>
<td>-.041</td>
<td>-.008</td>
<td>.221**</td>
<td>1</td>
<td>.030</td>
<td>.090</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>.496</td>
<td>.900</td>
<td>.000</td>
<td>.621</td>
<td>.136</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI</td>
<td>-.104</td>
<td>.043</td>
<td>-.031</td>
<td>.030</td>
<td>1</td>
<td>.139*</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>.084</td>
<td>.471</td>
<td>.606</td>
<td>.621</td>
<td>.021</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>DMFT</td>
<td>.000</td>
<td>.044</td>
<td>.128*</td>
<td>.090</td>
<td>.139*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>.995</td>
<td>.470</td>
<td>.033</td>
<td>.136</td>
<td>.021</td>
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<td></td>
</tr>
</tbody>
</table>

OHIP- Oral health impact profile

DAQ- Dental Anxiety Questionnaire

CPI- Community periodontal index

DMFT- Decayed, Missing, Filled teeth

**, Correlation is significant at the 0.01 level.

*, Correlation is significant at the 0.05 level.

Discussion

The present study was conducted to ascertain the relationship between dental anxiety, OHRQoL and oral health status of Indian Coast Guard personnel in Mangalore, Karnataka. The present study is the first systematic endeavor to examine the association between dental anxiety, dental health parameters and OHRQoL among Coast Guard personnel.

Number of participants with decayed teeth in the present study (63.2%) was higher than those reported by Bhardwaj et al. among policemen of Shimla, Skec et al. among Croatian army personnel, Sohi et al., among North Indian policemen and Singh et al. among Bhopal policemen. Jasmin et al. reported a higher prevalence of dental caries among Malaysian army compared to our study. Mean scores for DMFT in the present study (2.94) were higher than those reported by Singh et al., and Skec et al.

Mean decay of respondents in the present study was 1.54, which was lower than the findings reported by Skec et al., and Jasmin et al., among the Croatian army and Malaysian army respectively. The decayed component was found to be higher among respondents in the present study than those reported by Singh et al. Study by Kelbauska et al., among Lithuanian army reported higher prevalence of smoking among the participants compared to our study (22%). About alcohol consumption our study findings showed higher number coast guards (40.8%) consume alcohol than reported by Satapathy et al. Regarding tobacco chewing, our study showed lower prevalence than those reported by Satapathy et al.

Fluorosis was found to be lesser among the participants in the present study as compared to that reported by Bhalla et al. The probable reason could be the fact that Bhalla et al., conducted their study in a high-fluoride area. The percentage of participants with dentures in the present study was lower than that
reported by Sohi et al.,\textsuperscript{11} and Kudo et al.\textsuperscript{17} Regarding prosthetic need of participants, findings of the present study were similar to the study reported by Bhalla et al.\textsuperscript{16}

OHRQoL scores were found to be higher in the present study than those reported by Kudo et al.\textsuperscript{17} among Japanese army personnel. Results of the present study provide baseline information which can be useful for initiating further research on probable consequences of dental anxiety among army personnel. OHRQoL might be used as a substitute for screening of Army personnel in conditions like community wide assessments to detect individuals likely to have severe caries and periodontal problems.

Findings of our study show high prevalence of dental caries and periodontal problems among Coast Guards. The findings of the present study showed no significant co-relation between effect of poor oral health on OHRQoL and showed little impact of dental anxiety on OHRQoL. In developing countries, the rising trend in caries incidence is attributed to significant changes in life-style patterns.

An inherent limitation of the present study was the cross-sectional design which does not give any insights into the causality. Lack of time and interest might alter the answering pattern of participants. A major limitation in answering the questionnaire may be the associated social desirability bias and lack of complete understanding of the questionnaire.

Conclusions

In conclusion, this study demonstrated high prevalence of dental caries among coast guards in Mangalore city. Though our findings failed to show significant association but the overall oral health status of coast guard personnel were relatively poor and require early treatment. Thus there is a need for oral health promotion and awareness among military personnel. As the life style for the participants were very strict, disciplined and hectic, early identification of dental problems and treatment would be highly useful.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Obtained from Institutional Ethics Committee (IEC) of Manipal College of Dental Sciences, Mangalore

References


Effect of Blink Rate among Visual Display Terminal and Non-Visual Display Terminal User

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Abstract

The digital technology has become a necessity and is integrated into our daily activities. This ever increasing use of visual display terminal (VDT) has led to an increase in eye-related symptoms. Dry eye disease (DED) is frequently encountered problem among VDT users. Not just the adults, but it is becoming common among children as well especially when they have reduced amount of outdoor activities. Dry eye occurs can happen due to inadequate amount of tears or poor quality of tears due to reduced blink rate. Subjects on digital device users are often found to have symptoms but with little evidence to compare with non-visual display terminal users. A total of 288 subjects were recruited in the study. Of which 144 were VDT and 144 were non-VDT users. The mean age of VDT and non-VDT users were 27.72±4.88 years (Male= 102, Female = 42) and 25.96±5.43 years (Male=77, Female=67), respectively. Blink rate of VDT and non-VDT users were recorded. All the subjects were given Ocular Surface Disease Index (OSDI) questionnaire to record their symptomatic score for dry eye. Data were collated and analysed on SPSSv21 and correlation analysis was performed between VDT users and non-VDT users using paired sample test. $P$-value<0.05 and confidence interval (CI) of 95% was considered statistically significant. 82.64\% of VDT users were found to have affected blink rate. Mean blink rate in VDT and non-VDT users were found to be 5.88±4.88 and 11.12±7.84 respectively ($P = 0.01$). Risk of blink rate getting affected due to VDT use were found to be higher than non-VDT (OR=3.02; 95\% CI (1.75-5.22), p =0.001). Statistical significant differences were found in blink rate of VDT and non-VDT users of different age group ($p<0.05$). Prevalence of dry eye was found out to be 44.44 \% as per OSDI score. It also shows that male were more symptomatic for dry eye compared to female in both the groups of VDT and non-VDT.

VDT users were found to have reduced blink rate and were found to be more symptomatic for dry eye. Therefore, a quick and non-invasive description may be a useful aid to the diagnosis and prevention of further chronic ocular problems.

Key words: Blink rate, Visual Display Terminal, Dry eye disease, Ocular surface disease index

Introduction

The technological innovations has touched every part of our lives, whether home or at work. The digital technology has become a necessity and is integrated into our daily activities. We spend more and more hours with visual display terminal (VDT) devices such as computers, laptops, TV screens, mobile phones and tablets. Use of VDT devices is often associated with eye and visual problems. Typical ocular complaints experienced by intensive VDT devices (more than 3 hours a day) include dryness, redness, burning, sandy-gritty eye irritation or sensitivity to light and eye fatigue. These symptoms are also known as Dry Eye Disease (DED), which is a major part of the Computer Vision Syndrome (CVS) \cite{1}.
Blinking of an eye spread tears on the whole surface and provides lubrication, wash away dust and microorganisms. Blinking ensures the normal distribution of the tear film. Any abnormalities to blinking may result in poor tear distribution and hence cause damage to the ocular surface. It has been reported that the normal spontaneous blink rate is between 12 and 15/min. The blink rate may be affected by many factors, including Parkinson's disease, corneal sensitivity disorders, progressive supra nuclear palsy and other factors such as changes in the gaze, lighting, ambient temperature, and humidity that reduce the number of blinks and cause excessive ocular surface exposure.

In dry eye disease, blink may function as a compensator for a dysfunctional and unstable tear film further worsening the negative consequences on visual function. Spontaneous eye blinking has been found to be significantly reduced during use of digital screen. Dry eye disease during VDT operation could be caused by either a reduced blink rate or increased corneal exposure produced by the primary gaze position of the monitor. Reduced blinking may also exaggerate symptoms of pre-existing dry eye, which could be exacerbated by other aspects of the work environment. Changes in the blink rate and pattern during computer use may cause ocular discomfort due to lack of adequate tear distribution leading to dry eye disease (DED). DED is a condition of various aetiologies, acting through common mechanisms of tear hyperosmolarity and instability. This ultimately causes ocular surface inflammation, epithelial (corneal and conjunctival goblet) cell damage and the subsequent symptoms associated with the condition. DED can affect one or both eyes and being an asymptomatic disease, its diagnosis is inaccurate without assessing symptoms of dry eye disease. The symptoms include irritation, grittiness, burning, soreness, watery eyes and visual disturbances. Further, a compromised corneal epithelium may increase the risk of ocular infection. The prevalence of DED is reported by various epidemiological studies with 5% to over 35% at different ages, with a greater incidence in the older population and those of Asian and Hispanic races. Recent studies reported that the individual with DED were more likely to experience difficulties with reading, professional work, driving, watching television and using computers. The impact of DED on visual function includes reduction in contrast sensitivity, visual acuity, and vision related quality of life. The purpose of the present study was to determine the effect of blink rate among VDT users.

Method

Study Design

The present study was a cross sectional design conducted from June 2017- June 2018 at Sankara Eye Hospital, Punjab, India.

Subject and Data Collection

A total of 288 participants aged between 18 to 35 years were selected. Prior permission was taken from the organisation and subjects and informed consent was obtained from all subjects. Subjects were randomly selected and underwent detailed ocular examination and medical history. The duration of daily VDT work was specified into two groups’ as follows: VDT= more than 2 hours per day and non-VDT= less than 2 hours per day.

Inclusion/exclusion criteria

All the subjects with best corrected visual acuity 0.0 logMAR for distance and near. Subjects with the following factors were excluded such as age above 35 years, subjects with any ocular disease, those who undergone any refractive surgery, history of contact lens wear, diabetes mellitus, connective tissue disease, postmenopausal oestrogens therapy, medications like lubricating eye drop, vitamin A therapy or any binocular vision anomalies.

Methodology

Blink rate was assessed by instructing subjects to read text aloud. The text was composed of cognitively demanding stories. VDT users were instructed to read from a laptop screen (dell with a 14-in monitor) and non-VDT users were instructed to read from hard copy at a viewing distance of 40 cm for a continuous 2 minute period. A forehead rest was used throughout the task to maintain a constant viewing angle and working distance. The text was single spaced, black, 10-point Times New Roman font, with a contrast of approximately 80%. Target luminance was approximately 15 cd m². To ensure concentration, subjects were told that they would be asked questions about the passage at the end of the session. During the task, subjects blink rate was assessed and OSDI questionnaire was also distributed to find out symptomatic dry eye score. The OSDI was assessed on a
scale of 0 to 100, with higher scores representing greater disability. OSDI is a 12 items questionnaire based on visual function, ocular symptoms and environmental trigger where subjects recall symptoms of 1 week. Total OSDI scores are calculated as \( \text{OSDI} = \frac{\text{sum of scores} \times 25}{\text{number of questions answered}} \). The scores ranging 0 to 12 represented normal, 13 to 22 as mild DED, 23 to 32 moderate DED, and >33 as severe Dry Eye Disease (DED) [19].

**Result**

A total of 288 subjects were recruited in this study, of which 144 were VDT users and 144 were Non-VDT users where mean age of VDT users and Non-VDT users were 27.72±4.88 years (Male= 102, Female = 42) and 25.96±5.43 years (Male=77, Female=67) respectively (Table 1). 82.64% of VDT users were found to have affected blink rate (Table 2). Mean blink rate in VDT and non-VDT users were found to be 5.88±4.88 and 11.12±7.84 respectively. There was statistical significant changes in blink rate in between VDT and Non-VDT (\( p = 0.001 \)). Risk of blink rate getting affected due to VDT use were found to be higher than Non-VDT (OR=3.02; 95% CI (1.75-5.22), \( p =0.001 \)).

Mean blink rate of male and female in VDT users were found to be 4.99 ± 4.52 and 7.95 ± 5.11 respectively whereas mean blink rate of male and female in non VDT users were found to be 10.23 ±7.62 and 11.72 ± 7.60. Statistical significant difference was found between blink rate of male and female of VDT users (\( p=0.01 \)) (Table 3).

Table 4 shows statistical significant differences in blink rate of VDT and non-VDT users of different age group. Out of all subjects with affected blink rate (<12 per min) in VDT and non-VDT 37.82% of VDT and 38.64% of non- VDT showed symptoms of DED of OSDI scale (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (%) of VDT respondents</th>
<th>No. (%) of non-VDT respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>102 (70.80%)</td>
<td>77 (53.47%)</td>
</tr>
<tr>
<td>Female</td>
<td>42 (29.10%)</td>
<td>65 (41.14%)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>11(7.6%)</td>
<td>29(20.13%)</td>
</tr>
<tr>
<td>21-25</td>
<td>37(25.69)</td>
<td>47(32.63%)</td>
</tr>
<tr>
<td>26-30</td>
<td>49(34.02)</td>
<td>27(18.75%)</td>
</tr>
<tr>
<td>31-35</td>
<td>47(32.63)</td>
<td>41(28.47%)</td>
</tr>
</tbody>
</table>

**TABLE 2- Distribution of blink rate in VDT and non-VDT users**

<table>
<thead>
<tr>
<th>Variables</th>
<th>No.(%) of subjects with Blink rate greater than 12</th>
<th>No.(%) of subjects with Blink rate less than 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDT Users</td>
<td>25(17.36%)</td>
<td>119(82.64%)</td>
</tr>
<tr>
<td>Non-VDT Users</td>
<td>56(38.89%)</td>
<td>88(61.11%)</td>
</tr>
</tbody>
</table>

**Table 3- Mean Blink rate of Male and Female in VDT and Non-VDT users**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDT</td>
<td>4.99±4.52</td>
<td>7.95±5.11</td>
<td>0.01</td>
</tr>
<tr>
<td>Non-VDT</td>
<td>10.23±7.62</td>
<td>11.72±7.60</td>
<td>0.248</td>
</tr>
</tbody>
</table>
Table 4- Mean blink rate with Standard deviation in age group of VDT and non-VDT users

<table>
<thead>
<tr>
<th>Age</th>
<th>VDT</th>
<th>Non-VDT</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Blink rate</td>
<td>Mean Blink rate</td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>8.09±4.57</td>
<td>12.34±6.33</td>
<td>0.02</td>
</tr>
<tr>
<td>21-25</td>
<td>7.48±4.33</td>
<td>10.34±7.46</td>
<td>0.03</td>
</tr>
<tr>
<td>26-30</td>
<td>4.40±3.91</td>
<td>8.70±8.77</td>
<td>0.02</td>
</tr>
<tr>
<td>31-35</td>
<td>5.65±5.65</td>
<td>12.75±8.19</td>
<td>0.001</td>
</tr>
<tr>
<td>Mean</td>
<td>5.88±4.88</td>
<td>11.12±7.84</td>
<td>0.001</td>
</tr>
</tbody>
</table>

OSDI scores and their associated factors

Table 5 shows the prevalence of dry eye to be 44.44%. It also shows that male were more symptomatic for dry eye compared to female in both the groups of VDT and non-VDT. There was statistical difference between the genders whereas female showed higher OSDI score in VDT users as compared to male (p=0.001). A statistical significance difference was observed between the age group 15-20 years (p= 0.01) (Table 6).

Table 5- Distribution of OSDI response in VDT and non-VDT users

<table>
<thead>
<tr>
<th>Variables</th>
<th>VDT</th>
<th>Non-VDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.(%) of subjects with OSDI score &gt;12</td>
<td>64 (44.44%)</td>
<td>64 (44.44%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>39 (60%)</td>
<td>40 (62.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>24 (37.5%)</td>
<td>22 (34.37%)</td>
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</table>

Table 6- Study variables, OSDI mean score values and standard deviation (SD) of the study population

<table>
<thead>
<tr>
<th>VDT</th>
<th>Non –VDT</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Mean OSDI score</td>
<td>Mean OSDI score</td>
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</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12.84±15.43</td>
<td>14.44±11.12</td>
</tr>
<tr>
<td>Female</td>
<td>19.79±16.99</td>
<td>8.30±8.90</td>
</tr>
<tr>
<td>Age group</td>
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<td></td>
</tr>
<tr>
<td>15-20</td>
<td>25.56±18.37</td>
<td>7.93±7.33</td>
</tr>
<tr>
<td>21-25</td>
<td>18.36±17.32</td>
<td>11.91±10.43</td>
</tr>
<tr>
<td>26-30</td>
<td>13.75±17.16</td>
<td>12.53±8.75</td>
</tr>
<tr>
<td>31-35</td>
<td>10.78±11.84</td>
<td>13.29±13.07</td>
</tr>
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</table>

Discussion

The mean blink rate of VDT users were found to be lesser than non-VDT users were 5.88 and 11.12 respectively. Several studies have shown that blink rate is reduced during visual display terminal device operation. Previous studies have reported normally people blink 10-15 times per minute. Studies have shown that the blink rate is significantly diminished when working at a computer [9]. This could be the reason for reduction in blink rate found in this study during performing reading
tasks in VDT. One possible explanation is that the attention demand is higher during reading tasks which reduces the blink rate [21].

A total of 44.44% of subjects were having dry eye symptoms and OSDI score showed there were significant changes between VDT and non-VDT users. According to the result the prevalence of DED in VDT users were found to be higher in female and young age group. The prevalence of dry eye disease had been found to be variable from the previous population based as well as hospital-based studies. Studies have reported the prevalence of dry eye to be varying from 5% to as high as 73.5% [20]. Recent update from the Dry Eye Workshop (DEWS) stated that the global prevalence of dry eye disease to be around 17% while several other studies show a higher prevalence of approximately 30% in people of Asian descent. As per a survey conducted in 2015, 92% of eye care practitioners suspected that modern technology contributes to increase in dry eye symptoms among young adults [22].

This study reflects a major burden of DED among the non-clinical population of VDT and non-VDT user. DED was found to be equally (44.44%) affecting both VDT and non-VDT users but severity were more in VDT users which is in agreement with previous study where 23.4% presented definite dry eye and 44.4% suspect dry eye while among controls, 2.9% presented definite dry eye and 52.8% suspect DED [23]. Dry eye disease is a multifactorial disease of the tears and ocular surface it can affect both VDT as well non-VDT users. The study was limited to 288 subjects and requires a larger population to further analyse for the prevalence of DED and its association with blink rate in VDT and non-VDT respondents.

**Conclusion**

This study confirmed that the blink rate decreases in VDT users which can leads to DED so specially designed ocular examination associated counselling for VDT users would go a long way in preventing the loss of productivity and morbidity arises from the condition.

**Acknowledgement:** Funding: None

**Disclosures:** No Conflict of Interest

**Ethical Clearance:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Nickel Induced Alteration of Pathophysiology of Lungs in Experimental Rats

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Abstract

Background: Nickel and its compounds are known lung carcinogens, hypoxia mimicking effect of divalent nickel (Ni (II)) plays a crucial role in transformation of cells and the progression of tumours. In this study we aimed to evaluate the possible pathophysiological alterations of lung tissues of rats exposed to nickel sulphate.

Materials & Method: For this study 12 male albino rats were randomly divided into two groups: control (placebo), NiSO4 and given respective interventions for 21 days. % body weight gain, pulmonary-somatic index was calculated. In lung tissue homogenates of all groups of animals, concentration of lipid peroxidation product malondialdehyde (MDA), nitric oxide (NO) and antioxidant l-ascorbic acid was estimated spectrophotometrically and lung tissue histopathological observations were also made.

Results: Our results shows significantly decreased % body weight gain, elevated lung tissue MDA, NO and concomitant decrease of l-ascorbic acid concentration in NiSO4 treated groups when compared to control group. Histopathological observations of lung tissue sections of NiSO4 treated group showed eosinophilic oedema fluid filled alveoli, cystic macrophages, thickened interstitial septa, leucocytic infiltration, haemorrhage and acute bronchiolitis.

Conclusion: Our results demonstrate that heavy metal nickel exposure leads to increased pulmonary oxidative and nitrosative stress, decreased concentrations of antioxidants like l-ascorbic acid and histopathological alterations in lungs. So we can conclude that people exposed to heavy metals like nickel may be more prone for lung disorders irrespective of the route of exposure.

Keywords: nickel, lungs, histopathology, malondialdehyde, nitric oxide, l-ascorbic acid, lipid peroxidation

Introduction

Industrial usage of heavy metals like nickel (II), cobalt and chromium (VI) is increasing, so industrial workers are more prone to exposure related health consequences1. Occupational exposure of nickel mainly occurs in the people working in industries like stainless steel manufacturing, electroplating, mining and metallurgy1. It has been reported that experimental animals administered with nickel sulfate leads to increased concentrations of lipid peroxide products, decreased activities of antioxidants like glutathione, superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GSH-Px)2. In many studies it has been reported that nickel toxicity leads to oxidative stress and the depletion of ascorbic acid levels in the cells might be one of the reasons3. Further it has been observed that lungs are the primary target organs...
in case of nickel exposure. It has also reported that consumption of nickel through water and food develop pneumo-toxicity\textsuperscript{4}. Hence the present study has been undertaken to evaluate the effect of nickel sulphate on pathophysiological changes in lung tissue.

**Materials and Method**

**Selection of Animals and Treatment:** 12 male rats of albino Wistar strain (\textit{Rattus norvegicus}) weighing 170 to 200 gm were acclimatized 12 hours light-dark cycle, 32 ± 2°C temperature for 10 days in the Central Animal House facility of BLDE (Deemed to be University), India. Animals were fed with standard pellet diet and water \textit{ad libitum}.

Rats were randomly distributed into 2 groups having 6 animals in each group. Animals of control group were treated with placebo and NiSO\textsubscript{4} group rats were treated with nickel sulphate in double distilled water at a dose of 2.0 mg/100 gm b.wt intraperitoneally for 21 days\textsuperscript{5}.

### % Body Weight Gain

Body weight of all groups of animals was recorded by using Sortorious digital scale before and after the intervention period. % body weight change was calculated by using the following formula\textsuperscript{6}.

\[
\text{% Body weight gain} = \frac{\text{Final body weight (gm)} - \text{Initial body weight (gm)}}{\text{Initial body weight (gm)}} \times 100
\]

### Animal sacrifice and Tissue collection:

After the 21 days of intervention period all groups of animals were anesthetized and sacrificed by cervical dislocation. Animals were dissected and lungs were taken out carefully, half lung stored at -20°C in phosphate buffer for biochemical parameters and half stored in buffered 10% formalin for histopathological procedures.

### Pulmonary- somatic index

After dissection both the lungs were washed in cold saline to remove excess blood and weight was taken by using digital scale. Pulmonary somatic index was calculated by using the following formula\textsuperscript{7}.

\[
\text{Pulmonary somatic index} = \frac{\text{Lungs weight (gm)}}{\text{Final body weight (gm)}} \times 100
\]

### Lung tissue lipid peroxide estimation

Lipid peroxidation product malondialdehyde (MDA) was estimated in lung tissue homogenate by Buege and Aust (1978) method\textsuperscript{8}. In brief 10% of lung tissue homogenate was prepared in 0.1 M phosphate buffer by using a tissue homogenizer (REMI Motors Pvt. Ltd, Mumbai, India), homogenate was centrifuged and supernatant was used for MDA estimation. In acidic conditions MDA reacts with Thiobarbituric acid (TBA) and gives pink colour and the absorbance was measured at 535 nm by using UV-Visible spectrophotometer (Schimadzu UV 1800, Japan).

### Lung nitric oxide and l-ascorbic acid estimation

Lungs were dissected out, washed with chilled saline immediately and stored in tissue container at -20°C until used. Lung tissue homogenate was prepared by using 0.9 % saline (500 mg of lung/ 5 ml 0.9 % saline); 1 ml homogenate was mixed with 2 ml of ethanol (1:2 v/v) and cold centrifuged (4 °C) at 1500xg for 15 min and used for tissue nitric oxide estimation\textsuperscript{9}. 1ml of supernatant was collected and mixed with 2 ml of 10% TCA and centrifuged at 4°C at 1500xg for 15 min for the quantitation of tissue l-ascorbic acid\textsuperscript{10}.

### Lung Histopathology Procedure

Lung tissues were dissected and washed in cold saline to remove the excess blood and then tissues were stored in 10% neutral buffered formalin for histopathological evaluations. Paraffin blocks were made with fixed tissues and made sections of 3-5 μm thickness, deparaffinized, rehydrated and stained with haematoxylin and eosin (H&E)\textsuperscript{11}. The stained tissue sections were observed under a photomicroscope and photographed (Olympus BH-2 with Samsung digital colour camera, Model No. SDC-242).

### Statistical Methods

Values will be presented as Mean ± SD. \( P \) value \( \leq 0.05 \) will be considered as statistically significant. Comparison of values between two groups was done by unpaired ‘t’ test by using SPSS (Version.16.0) software.

### Results

Our results showed significant decrease in % body weight gain in NiSO\textsubscript{4} treated rats when compared to control rats (Table 1). We had also observed no statistically significant difference in pulmonary-somatic index between control and NiSO\textsubscript{4} rats.
Table 1: Statistical comparison of % body weight gain, pulmonary-somatic index and concentrations of MDA, NOx, l-ascorbic acid in lung tissues of control and NiSO$_4$ groups (n=6 in each group).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control</th>
<th>NiSO$_4$</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Body weight gain</td>
<td>27.85 ± 1.48</td>
<td>8.15 ± 2.60</td>
<td>0.00*</td>
</tr>
<tr>
<td>Pulmonary-somatic index</td>
<td>0.91 ± 0.15</td>
<td>0.81 ± 0.23</td>
<td>0.425</td>
</tr>
<tr>
<td>Lung MDA (µM/gm of tissue)</td>
<td>27.83 ± 3.33</td>
<td>56.47 ± 6.81</td>
<td>0.00*</td>
</tr>
<tr>
<td>Lung NOx (µM/gm of tissue)</td>
<td>15.89 ± 3.15</td>
<td>31.41 ± 4.86</td>
<td>0.00*</td>
</tr>
<tr>
<td>Lung l-ascorbic acid (mg/gm of tissue)</td>
<td>14.10 ± 3.87</td>
<td>4.95 ± 1.25</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

Values are expressed as Mean ± SD. Unpaired ‘t’ test was done to compare the values between two groups. p value (>0.05) not significant, p* (<0.001) highly significant; MDA,malondialdehyde; NOx,nitric oxide.

We have observed significant increase of lung tissue MDA and NO concentration in NiSO$_4$ treated rats when compared to control group. We have also observed a significant decrease in antioxidant vitamin l-ascorbic acid concentration in NiSO$_4$ treated rats when compared to control (Table 1).

H&E stained lung tissue sections of control group rats (Fig. 1a & 1b) showed normal lung histological architecture like lung parenchyma consisting of bronchi, bronchioles and thin walled alveoli separated by intervening interstitial connective tissue containing small pulmonary capillaries.

H&E stained lung sections (Fig. 1c & 1d) of NiSO$_4$ treated group showed dilated alveolar spaces filled with eosinophilic oedema fluid and cystic macrophages. It also showed thickened interstitial septa by oedema, congestion and haemorrhages and leucocytic infiltration and acute bronchiolitis.

**Discussion**

Pulmonary somatic index represents the degree of damage to the pulmonary system. Decreased lung somatic index in NiSO$_4$ treated group may be due to decreased protein synthesis, inflammation, fibrosis, haemorrhage etc.

NiSO$_4$ is known to be inducer of reactive oxygen species (ROS), and we have observed increased concentrations of MDA in lung tissues. All biological
membranes contain unsaturated fatty acids in their structure, hence peroxidation of membrane lipids leads the membrane damage and cell necrosis8,12. MDA is the product resulted from peroxidation of poly unsaturated fatty acids (PUFA)8. Formation of lipid endoperoxides in unsaturated fatty acids containing at least 3 methylene interrupted double bonds lead to the formation of malondialdehyde as a breakdown product8. Increased MDA levels in lung tissue indicating increased oxidative stress and cell damage in the present study.

Nickel sulphate induces increased lung nitric oxide concentration which may be due to increased activities of inducible nitric oxide synthase (i-NOS) in lung tissues6. Increased NOx level in nickel treated rats probably reacted with superoxide and produced peroxynitrite to develop nitrosative stress in the lungs12. Peroxynitrite interns alter the protein structure and affects its function in target tissues12. These findings in the present study were supported by the results of histopathological studies.

Intra cellular ascorbic acid concentration is a marker of oxidant-anti oxidant balance and it has been found that nickel induces intracellular ascorbic acid depletion leads to altered cell signaling mechanism resulted in carcinogenesis 13. Our study also showed decreased concentration of ascorbic acid in lung tissues, these decreased antioxidant levels may lead to oxidant-antioxidant imbalance, oxidative and nitrosative stress which finally leads to cell necrosis and even cell death.

The histopathological observations on lung tissues in nickel treated rats clearly indicate pathological alterations in lung tissue by inducing integrity of alveolar tissues. The observations from the present study clearly indicate nickel induced oxidative stress and oxidant-antioxidant imbalance, generate lung tissue inflammatory responses 14. Possibly nickel induced alveolar damages may lead to develop cellular hypoxia and may alter pathophysiology of lung tissues 15.

Conclusion

Nickel sulphate is found to be a pulmonary toxic heavy metal which leads to develop oxidative and nitrosative stress in lung tissues. Histopathology of lungs in nickel treatment supports these observation.

**Conflict of Interest:** Authors declare that there is no conflict of interest.

**Source of Funding:** Corresponding author acknowledge the financial support from the VGST (VGST-KFIST/1230/2015-16 Dated 22/6/2016) Government of Karnataka, India.

**Ethical approval:** Institutional Animal Ethics Committee (IAEC) approval was taken from BLDE Association’s Shri Sanganabasava Mahaswamiji College of Pharmacy & Research Centre, BLDE (Deemed to be University), Vijayapur, Karnataka, India (Ref: BLDE/ BPC/641/2016-2017 dated 21.10.2016) and all the experiments on animals were carried out by following CPCSEA (Committee for the Purpose of Control and Supervision of Experiments on Animals), Government of India.

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Consequences Towards E-Pharmacy and its Validated Growth Firms on Herbal and Organic Products

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Abstract

The sudden regulatory challenges and pharmacist activities last year filed a plea against online pharmacy and drug stores, over 280 online medical stores (Netmeds, 1mg, Sasta Sundar, Pharm easy, and Myrameds etc) have started up in the year 2010 where they reached tremendous growth by the year 2018, by marketing the medical products in particular selling the herbal, ayurvedic, especially the organic product in name of Bio, Go green etc., they achieved the target in selling the counter drugs too, where this article represents, the sudden consequences towards e-pharmacy and its validated growth firms on Herbal and Organic products with a comparison of offline and online medical stores and in constant whether the selling and buying of herbal and organic products in online have really affected people overall and its growth towards herbal and organic growth sectors.

Keywords: Ayurveda, Herbal, Organic, E-pharmacy, Online.

Introduction

Buying medicines online seems convenient but many are wary over the easy availability of drugs sold online. The associations of retail chemists and pharmacists are up in arms against the draft rules issued by the centre on sale of drugs by online pharmacies. The new rules have been proposed to ensure accessibility and availability of genuine drugs to people across India from authentic online portals. These rules have been issued by the Central government’s Department of Health and family welfare to seek inputs from stakeholders.

As we discussed, The sudden regulatory challenges and pharmacist activities last year filed a plea against online pharmacy and drug stores, over 280 online medical stores (Netmeds, 1mg, Sasta Sundar, Pharm easy, and Myrameds etc) have started up in the year 2010 where they reached tremendous growth by the year 2018, by marketing the medical products in particular selling the herbal, ayurvedic, especially the organic product in name of Bio, Go green etc., they achieved the target in selling the counter drugs too, where this article represents, the sudden consequences towards e-pharmacy and its validated growth firms on Herbal and Organic products with a comparison of offline and online medical stores and in constant whether the selling and buying of herbal and organic products in online have really affected people overall and its growth towards herbal and organic growth sectors.

What is an e-pharmacy:

An online pharmacy, Internet pharmacy, or mail-order pharmacy is an e-pharmacy that operates over the Internet and sends the orders to customers through the mail or shipping companies.

Online pharmacies might include:

1. Pharmacy benefit manager – A large administrator of corporate prescription drug plans
2. Legitimate Internet pharmacy in the same country as the person ordering.
3. Legitimate Internet pharmacy in a different country than the person ordering. This pharmacy usually is licensed by its home country and

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follows those regulations, not those of the international orders.

**Role of Online Pharmacy in India**

Online pharmacies in India have significantly increased due to growing E-commerce in India and little regulation of the industry, it has been clearly mention in Wikipedia also.

So far there is no regulatory control over the drug buying advertisements on national television or through the web series.

Definitely, the incredible technology have built a major platform in meeting the healthcare objectives in India among the people with a simple and ethical word Bio, where, the Indian government was planning to spend Rs. 1,000 crore on computer literacy project for 50 lakh people over a period of 3 years, concerning to abide Indian citizens to access government services in field of e-education, e-health and e-governance, similarly, the healthcare providers in India are also expected to spend $10.5 billion on IT products and services in 2018.

**Legal status in India**

There is no specific law to deal with online pharmacies in India but multiple laws govern online pharmacies in an indirect manner. The Drugs and Cosmetics Act, 1940, and the Drugs and Cosmetics Rules, 1945, have guidelines on the sale of Schedule H and Schedule X drugs. These can be sold only on prescription and there are specific rules, including for labeling and bar coding.

**Online pharmacy laws in India**

When it comes to online pharmacy laws they are no particular and in specific laws on selling drugs in online particularly in India, since, the The Information Technology Act 2000 governs some of the legal issues pertaining to online dealings but it is silent on the aspect of online pharmacy. As a result, illegal online pharmacies have been increasing in India. It has been said that, if properly regulated, online pharmacies in India could prove beneficial to various stakeholders.

The reason when coming to the Indian Internet Pharmacies Association (IIPA) now it is renamed as Digital Health Platforms (DHP) and the big meeting held in Bangalore, The IIPA Secratry, Kiran Divakaran said, the member pharmacies will self regulate until the law of the land catches up to advancements in technology with the following conditions.

1. No Sale without prescription.
2. No Sale of Schedule X drugs.
3. Final Packing in a tamper-proof cover under the personal supervision of registered Pharmacist of the pharmacy.
4. Valid Bill for Every sale.
5. Facilitate Medicine Recall in case directed by the Govt.

The IIPA also is working actively with the Central Government to bring in changes to the regulations including the use of AADHAAR Number linked prescriptions to ensure there is no misuse.

With these regulatory affairs as the platform many online pharmacy navigated in several ways in playing a specific marketing role in selling ayurveda, herbal and organic products overall, with an effective and authorized e-pharmacy draft (28th August, 2018), released by the Union Health Ministry of India, the draft rules slated, the sale of drugs by online / e-pharmacies with an aim to regulate online sale of medicines across India and provide patients access to genuine drugs from authentic online portals. With the important point like:

a. No person will distribute or sell, stock, exhibit or offer for sale of drugs through e-pharmacy portal unless registered.

b. Any person who intends to conduct the business of e-pharmacy shall apply for the grant of registration to the Central Licensing Authority in Form 18 (AA) through the online portal of the Central Government.

c. The application of registration of e-pharmacy will have to be accompanied by a sum of INR Rs. 50,000 while asserting that an e-pharmacy registration holder will have to comply with provisions of Information Technology Act, 2000 (21 of 2000).

d. No e-pharmacy shall advertise any drug on radio or television or internet or print or any other media for any purpose.

e. The e-pharmacies portals are mandatory
required to have at least 12 Hours and all seven days a week customer support and grievance readress of all stakeholders. The customer support should have a registered pharmacist in place to answer the queries of customers through such customer helpline.

**Consequences on e-pharmacy in India**

As we discussed earlier, over 280 online medical stores (Netmeds, 1mg, Sasta Sundar, Pharm easy, and Myrameds etc) have started up in the year 2010 where they reached tremendous growth by the year 2018, by marketing the medical products in particular selling the herbal, ayurvedic, especially the organic product in name of Bio, Go green etc., they achieved the target in selling the counter drugs too, there was a strong opposition on online drug stores raised by AICDA (All India Chemist and Druggist Association) and IPA (The Indian Pharmaceutical Association) stating that, “We strongly oppose online drugstores. We held an emergency meeting today and will launch a nationwide protest on September 20 to oppose these rules. All pharmacy shops will close down. Our entire association is against online pharmacy as the authenticity of prescriptions on these sites cannot be cross-checked. It will destroy lakhs of jobs,” The MRPA argued that nearly 8.5 lakh conventional chemist outlets will be shut down leading to the loss of more than two crore direct and indirect jobs.

![Fig 1: Pill – Popping facts represented by J S Shinde, president, AICDA](image)

AICDA also said that this compromises the financial and medical privacy of customers. The data for which could be misused or sold to insurance companies and hospitals.

In these circumstances, after several pleas and trial a challenging a order banning sale of medicines online till the central health ministry formalizes the regulatory environment for web-based drug aggregators, the Delhi high court has asked the authorities to file their stand on or before the next date of hearing February 25, 2019. With these recent issues, amendments and several consequences depicted on the e-pharmacy sectors, do the online drug war have really affected the herbal and organic products in selling and buying through online have raised up with two questions:

1. If yes what is the validation towards the competition
2. If no merely the down fall on buying and selling and
3. How far the e-pharmacy pharmacist faces the consequences.

**Growth firms on Herbal and Organic products**

Consumers are attracted to herbal and organic products for their health and beauty needs, since they believe that these products does not have any potential side effects that may come from taking certain herbs. The stakeholders and retailers have achieved best way to do attain their marketing level on selling their products in e-pharmacy and in the online pharmacy marketing these products have exhibited and provided extensive information for all of their products with a clear prescription page, side effects, colorful diagrams, product reviews and ratings. In addition to an A-to-Z guide to herbs and some organic supplements, you should also answer consumer questions such as:

- How should I use this herb? Can I drink it or use it as aromatherapy?
- How much can I use at one time?
- Are there any side effects?
- Can I use it with certain medications?

to attract people in front of their desk as a time consuming manner etc., the growth of herbal and organic products have achieved their peak level in online pharmacy business. Yes, with a few examples and questions, here we can validate the growth of these products.

**Herbal and Organic products Versus Online pharmacy**

The organic and herbal product segment is still at a nascent stage in India; both the Government and private players need to develop a strong policy framework that can benefit all involved. The organic farming industry
in India holds immense potential to grow, provided it receives steady investment and benefits from both existing and new initiatives like incentivizing organic cultivation, food processing, certification and regulatory ease and tax benefits. Some of the challenges faced by the organic sector emerged to sell their products in online pharmacy to achieve their selling targets.

**Raise up and Challenges**

In year 2018, there were a huge promotions and records in selling products like Himalaya, Herba life, Patanjali, Khadhi, Organics etc., with a great effort on describing the products with their benefits and side effects. While online pharmacies could be a boon for consumers, these have acquired a not-so-commendable reputation due to various reasons, the primary of which is the unregulated manner of functioning.

Online pharmacies reduce transactional costs and the costs of obtaining organic and herbal products through a more efficient centralized order-processing system. The reduced procurement and transactional costs are passed onto consumers in the form of lower prices (Fig 2). The anonymity offered by the internet encourages consumers to seek information about medicines that they would otherwise avoid asking their physician or at an offline pharmacy. Some of the pharmacy who attained their growth by year 2018:

![Fig 2: Health buddy Honest Organic Tea, which has been standard and certified with www.sastasunder.com.](image)

**Competitive Analysis of the Indian E-Pharmacy Market**

1. NetMeds
2. 1mg
3. Apollo Pharmacy
4. Healthkart
5. PharmEasy
6. MyraMed
7. Care On Go
8. Metapharmacy.in
9. Medidart.com
10. Medplusmart

**Down fall on buying and selling**

The IPA insisted that the government will have to extra cautious about sale of medicines through the internet. Only digital prescriptions with chronological numbering pan-India should be accepted as legal prescriptions because the possibility of forging cannot be ruled out if scanned or written prescriptions are allowed. In contrast, online suppliers will not be able to ensure temperature control on medicines which may cause resistance towards antibiotics. Patients’ safety and quality of drug should be of a paramount importance. With these downfalls the consumers or the regular visitors in 73% have stopped in seeking and buying organic and herbal products through online and visit nearby stores, even though they knew it’s the products of stakeholders.
and retailers the sudden trails on e-pharmacy have also countered the growth of herbal and organic products.

**Challenges and concerns towards implications**

Right from the advent of E-pharmacies in India, it appears that this organic and herbal Entrepreneur has been viewed suspiciously by the regulator; even though the regulator had clarified that there was no restriction on online sale of drugs provided that it complied with the existing legal regime. It can be argued that while some of this suspicion that they need full freedom to sell the herbal and organic products on the same online stores under the same banner.

While the draft rules are not yet available in the public domain, one interesting proposal that is being mooted is to allow E-pharmacies to obtain a single registration from the Central Drugs Standard Control Organization, instead of obtaining different registrations from each state where such E-pharmacy will operate, in particular with selling the herbal and organic products with a community trade name and authorized selling codes and regulatory without abiding with drugs. While it remains to be seen how these regulations will address the aforementioned identified concerns and challenges, the recent move on part of the Government to encourage this sector especially the community branded herbal and organic products and to introduce a specific legal regime for governing online sale of these should be welcomed as a favorable step by E-pharmacies.

**Conclusion**

To conclude, with few challenges and concerns, it is true, that consumers are attracted to herbal and organic products for their health and beauty needs, since they believe that these products does not have any potential side effects that may come from taking certain herbs. The stakeholders and retailers have achieved best way to do attain their marketing level on selling their products in e-pharmacy and in the online pharmacy marketing these products have exhibited and provided extensive information for all of their products with a clear prescription page, side effects, colorful diagrams, product reviews and ratings. Where, even though the high court bans the e-pharmacy selling, they can ban only some of the antibiotics and regulated medications in selling which will be good statement on considering public health and population in buying drugs in online, in contrast they cannot ban the selling of herbal or organic products, yes, it’s a challenge in growth sectors, sure due to some facts people may stop buying the organic products in online, but it’s the important role for the stakeholders and retailers of the herbal and organic products to achieve their target in this incredible field.

**Discussion**

Consumer awareness is the key to curb; consumers need to be educated about the need to verify the authenticity of the service provider as well as the product and to avoid sites that sell drugs without a legal prescription. Good online pharmacies have well-defined safety and quality benchmarks, uncomplicated privacy and security policies, a verifiable physical address and licensed pharmacist on roll. A mutual awareness of online purchase of medicines by the patient and consumer is necessary for better management and avoidance of the consequences of self-medication. We need to reflect on the consumers’ interests and inclinations for online pharmacies to enhance a symbiotic the physician-pharmacist-patient relationship. These measures coupled with adequate monitoring from regulators can help the consumer reap rich benefits of these pharmacies.

**Ethical Clearance**: Since the article studies about online promotion on herbal products there is no need of clearance.

**Source of Funding**: Self.

**Conflict of Interest**: NIL.

**References**


Study of Bronchoscopy in HIV Infected Patients of Maharashtra Population

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Abstract

In the present study 90(58 males and 32 females) HIV infected tuberculosis patients were studied. Fibro optic bronchoscopy was used to study the pulmonary tuberculosis. Brachioalveolar clevage (BAL) and trans-bronchial biopsy (TBB) was performed In Zn stain study 58(64.4%) positive and in TB culture test 32(35.5%) positivity was observed. Bronchoscopic study with Zn test was done. Test positive with TB was 8(8.8%) additional test positive with TB was 6(6.6%). Sensitivity test was 16(17.7%), incremental sensitivity test was 9 (10%) specificity tests was 18(22.2%), PPV was 20(22.2%), and NPV was 13(14.4%). These obtained values were more significant and higher than value of non-bronchoscopic studies. Moreover this present bronchoscopy study was quite helpful for early diagnose and early to treat the patients of HIV infected pulmonary tuberculosis patients, so that lifespan of HIV infected patients can be prolonged.

Key words – BAL, TBB, TB Zeihl Nelson stain, BPV, PPV.

Introduction

Epidemiologic studies have proved that patients infected with human immune deficiency virus (HIV) are at increased risk of developing tuberculosis majority of the patients with tuberculosis are suffering with AIDS.¹ The sensitivity of sputum acid – fast bacilli (AFB) smears in HIV infected tuberculosis patients ranges from 31 to 80 percentage in different studies.²(3) However because of a typical appearance on chest roentgenograms, the diagnosis of tuberculosis may not suspected in HIV infected patients and sputum may not be positive for acid fast staining.⁴ hence it was difficult to diagnose the AIDS in tuberculosis patients therefore bronchoscope study in immuno comprised patients was carried out to confirm tuberculosis in HIV patients. Brancho alveolar levage (BAL) and transbromchial biopsy (TBB) were done for early diagnosis of tuberculosis in HIV patients⁵ so that the life span of HIV patients can be prolonged by proper treatment and creating immunity among HIV patients.

Material and Method

The 90 patients (58 males 32 females) were regularly visiting to pulmonary medicine department of Prakash institute of medical sciences research institute Urun- Islampur -415409, Sangli (Maharashtra) having symptoms of TB but suffering with HIV infection, aged between 20-45 year were selected for study.

Fibro-Optic bronchoscopy (FOB) was performed trans-nasally after premedication with sedatives, opiates and atropine. Topical lidocaine (xylocaine 2%) was used for local anesthesia, after inspection of the airways; the bronchoscope was wedged in a subsegmental bronchus of either the right middle lobe or lingula, when diffuse parenchymal disease was present. In patients with focal parenchymal involvement, the bronchoscope was wedged in areas of maximal involvement, as evident on chest roentgenogram. The Bronchoalveolar levage (BAL) consisted of 5 or 6 thirty (30) ml aliquots of normal saline solution, fluid was aspirated using mechanical suction. Subsequently a series of trans
bronchial biopsy (TBB) was performed after instillation of 2 to 5 ml of epinephrine (1: 1,000) aliquots of BAL fluid were sent for staining of the cell pellate in cytology laboratory, for AFB smear and culture and for potassium hydroxide preparation and fungal culture, Bronchoscopy with ZN staining were performed.

The obtained results with bronchoscopy Zn, Bronchoscopy culture were compared with previous studies performed without bronchoscopy.

The duration of study was about three years.

**Observation and Results**

**Table – 1: Bronchoscopic study of HIV infected (TB Patients)**

(Total No of Patients : 90)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ziehl nelson stain</td>
<td>58</td>
<td>64.4%</td>
</tr>
<tr>
<td>TB culture test</td>
<td>32</td>
<td>35.5%</td>
</tr>
</tbody>
</table>

Table – 1 Bronchoscopic study of HIV infected patients Ziehl nelson stain study was positive in 58(64.4%) patients and TB Culture test was positive in 32(35.5%) patients

**Table – 2: Comparative study of non – bronchoscopic and bronchoscopic studies for diagnosis of TB in HIV infected patients with percentage**

(Total No of Patients : 90)

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Name of the list</th>
<th>Non Bronchoscopic study zn</th>
<th>Bronchoscopic study with Zn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Test positive with TB</td>
<td>3(3.3%)</td>
<td>8(8.8%)</td>
</tr>
<tr>
<td>2</td>
<td>Additional test positive with TB</td>
<td>3(3.3%)</td>
<td>6(6.6%)</td>
</tr>
<tr>
<td>3</td>
<td>Sensitivity</td>
<td>10(11.1%)</td>
<td>16(17.7%)</td>
</tr>
<tr>
<td>4</td>
<td>Incremental sensitivity</td>
<td>10(11.1%)</td>
<td>9(10%)</td>
</tr>
<tr>
<td>5</td>
<td>Specificity</td>
<td>24(26.6%)</td>
<td>18(20%)</td>
</tr>
<tr>
<td>6</td>
<td>PPV</td>
<td>25(27.7%)</td>
<td>20(22.2%)</td>
</tr>
<tr>
<td>7</td>
<td>NPV</td>
<td>15(16.6%)</td>
<td>13(14.4%)</td>
</tr>
</tbody>
</table>

Zn = Ziehl nelson; NPV = Negative productive value, PPV = Positive productive value

Table – 2 comparative study of non bronchoscopic study with zn and bronchoscopic study with zn for diagnosis of TB in HIV infected patients with percentage.

1 – Test positive with TB in non – Bronchoscopic study was 3(3.3%) and bronchoscopic study was 8(8.8%) 2 – Additional test positive with TB in non Bronchoscopic study was 3(3.3%) and bronchoscopic zn study was 6(6.6%) 3 – sensitivity of zn was 10(11.1%) in non bronchoscopic study and 16(17.7%) in bronchoscopic study 4- incremental sensitivity was 10(11.1%) in non – bronchoscopic zn study 9(10%) in bronchoscopic study 5 – specificity was 24(26.6%) in non- bronchoscopic and 18(20%) in bronchoscopic study 6-PPV test was 25(27.7%) in non bronchoscopic and bronchoscopic study 20(22.2%) in was 15(16.6%) in 7- NPV test 13(14.4%) in bronchoscopic study
Discussion

In the present study of bronchoscopy in HIV infected patients of Maharashtra population zn stain test 58(64.4%) and TB culture test 32(35.5%) were positive (Table-1). Tests positive with TB 8(8.8%), additional test positive with TB 6(6.6%), sensitivity test 16(17.7%), incremental sensitivity test 9(10%) specificity test 18(20%) PPV 20(22.2%) NPV 13(14.4%) (Table-2) these findings were more or less in agreement with previous studies.(6)(7)(8) This study will be quite useful in HIV patients with TB. Because early detection of TB in HIV patients very important so that the patients are not late for the treatment and reduce the disease transmission. Diagnostic confirmation of pulmonary TB in HIV patients becomes problematic when clinical symptoms are suspicious. Microbiological examinations are most important for detecting the etiologic micro organism. The problem is the need of good quality of samples which is often very difficult to obtain in HIV TB patients hence bronchoscopic study was conducted to collect good quality of samples. ie BAL TBB.(9) In the present study HIV in TB patients had CD4 was below 200 cells /ul The present study findings were higher than previous non bronchoscopic study Zn smear examination were more significant than culture study with solid media required time to grow of 3-8 weeks. Liquid media detected 10% more TB cases positive than solid media study and required shorter duration of incubation for the growth of mycobacterium.(10) As non bronchoscopic study give negative results, and test were also time consuming but the bronchoscopic studies shorten the diagnostic time of pulmonary TB in HIV infected patients so that clinician could immediately provide TB treatment. Apart from mycobacterium, kaposis sarcoma, invasive aspergillosis, cryptomegalovirus pneumonia, were also observed during BAL, TBB, study, and treated accordingly.

Summary and Conclusion

The present study of bronchoscopy in HIV infected tuberculosis patients is quite helpful to early diagnose HIV patient suffering with pulmonary tuberculosis. But for usage of bronchoscopy require trained and cost effective expert moreover this study require to correlate the CD4 cell count to confirm the severity of disease and create awareness among the patients regarding nutritious food intake to create immunity to prolong the life span of the patient so that in due course of time there will be vaccine or treatment to eradicate the HIV disease in future.

This research paper is approved by ethical committee of prakash institute of medical science and research center Urun- Islampur-415409 Sangli (dist) Maharashtra.

No Conflict of Interest

No Funding

References

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Study of Dyslipidemia and Cardio Vascular Risk in Rheumatoid Arthritis Patients

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Ghanpur Medchal mandal and district Telangana State

Abstract

Rheumatoid arthritis is one of the commonest inflammatory arthritis and is commonly associated with various metabolic abnormalities including dyslipidemia which is an important risk factor for cardiovascular diseases. In this study 90 patients of Rheumatoid Arthritis (65 Females 25 males) aged between 35 to 60 years were included and compared with controlled (normal) group. The lipid profile study in RA patients and controlled group was compared.

Mean total cholesterol, LDL, VLDL and triglyceride levels 158.1, 187.5, 39.8 191.4 respectively were higher than normal in our study with a high significant p values (p<0.01) for all these parameters. The mean HDL level in this study was lower (23.80) as compared to normal subject with a significant p value of < 0.01.

Mean value of DBP (diastolic BP) in RA patients was 85.2 in controlled group 82.0 and p value was significant (p<0.01). Mean value of SBP (systolic BP) in RA patients was 139.8 and in controlled group 131.6 (p<0.01). The associated clinical manifestations were 20(22%) had angina, 7(7.7%) had MI, 27(30%) had diabetes mellitus, 17(18.8%) had IHD, 19(21.1%) were obese. This study of abnormal lipid profile in RA patients will be quite useful to evaluate and predict the risk factors for cardio vascular events in RA patients and to improve morbidity and mortality in such patients.

Key-words- RA= Rheumatoid Arthritis, IH= Ischemic Heart disease MI= myocardial infarction, DM = diabetes mellitus

Introduction

Rheumatoid Arthritis (RA), a chronic inflammatory joint disease of unknown etiology affects the both sexes, predominantly females than males. The mortality due to RA ranges from 1.3 to 3%.1 The increased mortality is largely attributed to cardio vascular disease (CVD) particularly coronary atherosclerosis2. The cardio vascular morbidity found in RA patients appears to be two folds or more compared to general population. The increased CVD risk in RA has many causes such as dyslipidemia, diabetes mellitus (DM) and hypertension. Moreover it is viewed that Anti Rheumatic drugs improve the adverse lipid profile seen in RA. Hence attempt is made to study the various parameters of lipid profile and blood pressure in RA patients so that elevated lipid profile and its association with disease activity with RA can be correlated because dyslipidemia is already present in early RA which has great risk of cardio vascular diseases.

Material and Method

This is a cross sectional observational study conducted at Mediciti Institute of Medical Science hospital Ghanpur Medchal mandal Telangana state over a period of three years from 2014 to 2017. Ninety patients including both sexes (25 males and 65 females),
aged between 35 to 60 years, who visited the medicine department at our institute, were selected for study. These patients were diagnosed rheumatoid arthritis (RA) patients. Their lipid profile test was carried out and their blood pressure was also recorded. The same number of healthy males and females (control group) were also studied including lipid profiles and blood pressure and compared with RA patients.

HIV, osteoarthritis and post traumatic patients having joint pain were excluded from the study.

Observation and Results

Table-1: Comparative study of lipid profile and blood pressure in RA patients and control group.

<table>
<thead>
<tr>
<th></th>
<th>Rheumatoid arthritis patients (n=90)</th>
<th>Control patients(n=90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol TC(mg/dl)</td>
<td>Mean 247.77 SD 0.96 T test 789.44 P&lt;0.01</td>
<td>158.18 SD 0.47</td>
</tr>
<tr>
<td>Triglyceride (mg/dl)</td>
<td>Mean 191.48 SD 0.51 T test 1051.72 P&lt;0.01</td>
<td>118.12 SD 0.42</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>Mean 187.56 SD 1.36 T test 29.47 P&lt;0.01</td>
<td>103.16 SD 26.99</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>Mean 23.80 SD 0.48 T test 0.98 P&lt;0.01</td>
<td>103.16 SD 0.89</td>
</tr>
<tr>
<td>VLDL (mg/dl)</td>
<td>Mean 39.82 SD 0.31 T test 335.90 P&lt;0.01</td>
<td>25.26 SD 0.26</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>Mean 85.20 SD 0.94 T test 25.21 P&lt;0.01</td>
<td>82.00 SD 0.74</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>Mean 139.88 SD 0.92 T test 48.61 P&lt;0.01</td>
<td>131.61 SD 1.31</td>
</tr>
</tbody>
</table>

DBP= Diastolic blood pressure, SBP= systolic blood pressure

Table-1: Comparative study of lipid profile and blood pressure study in RA patients and in controlled group. In the study mean total cholesterol value of RA patient was 247.7 (SD±0.96) and controlled group was 158.1(SD±0.47) t value was 789.44 and it had highly significant p value (p<0.01). In the study of triglyceride mean value of triglyceride of RA patients was 191.4 (SD±0.51) and in controlled group it was 118.1 (SD±0.42) t value was 1051 and statically highly significant p value (p<0.01). In the LDL study of RA patient mean value was 187.5 (SD±1.3) and in controlled group 103.1 (SD±26.9) t’ test value was 29.4 and p value (p<0.01) was highly significant. In HDL study mean value of RA Patients was 23.80 (SD±0.48) and in controlled group 27.5 (SD±0.89) and p value was highly significant (p<0.01). VLDL value mean value in RA patients was
39.8 (SD±0.31) and in controlled group it was 25.2 (SD±0.26) and p value was highly significant (p<0.01). The mean value of DBP (diastolic blood pressure) in RA patients was 85.2 (SD±0.94) and in controlled group it was 82.00 mmHg (SD±0.74) and ‘t’ test value was 25.2 p value was highly significant (p<0.01). The mean value of SBP (systolic blood pressure) in RA patients was 139.8 (SD±0.92) mmHg and in controlled group it was 131.6 (SD±1.31) mmHg ‘t’ test value was 48.6 p value was highly significant (p<0.01)

Table-2: Prevalence of associated clinical manifestation in RA patients

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Angina</td>
<td>20</td>
<td>22.7</td>
</tr>
<tr>
<td>2</td>
<td>MI</td>
<td>07</td>
<td>7.7</td>
</tr>
<tr>
<td>3</td>
<td>Diabetic mellitus</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>IHD</td>
<td>17</td>
<td>18.8</td>
</tr>
<tr>
<td>5</td>
<td>Obesity</td>
<td>19</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Table-2: prevalence of associated diseases in RA patients 20(22.2%) had angina. 7(7.7%) had MI, 27(30%) had diabetic mellitus, 17(18.8%) had IHD 19(21.1%) were obese.

Discussion

Rheumatoid arthritis is associated with systemic inflammation and is commonly associated with dyslipidemia. Lipid abnormalities are often associated with increased risk for various cardiovascular disorders. RA patients have an increased risk for CVD even at relatively low cholesterol levels. Dyslipidemia is a frequent occurrence in RA patients. Hadda V et al reported dyslipidemia in 38.5% of RA patients. In the present study of dyslipidemia and cardio vascular risk in RA patients the lipid profile of RA patients was compared with controlled group. Our study found that RA was associated with higher than normal levels of Total Cholesterol, LDL, VLDL and triglyceride with significant p value (<0.01). But the level of HDL was found to be lower than normal control group.

Mean value of SBP (systolic BP) was also higher in RA patients compared to controlled group. The associated clinical manifestation were 20(22.2%) angina, 07(7.7%) MI, 27(30%) DM, 17(18.8%) IHD, 19(21.1%) was obesity (Table-2). These findings are more or less in agreement with previous workers.

The RA and heart disease share common underpinnings involving inflammation. The high levels of inflammation characterize rheumatic diseases. The important metabolic feature of RA is the catabolic state leading to loss of body cell mass due to accelerated loss of skeletal muscle due to effects of various inflammatory mediators. These mediators are also associated with altered TC and HDL levels. Apolipoprotein A-1 is the protein present in HDL-C particles whereas apo lipoprotien B found on the LDL-C, VLDL and chylomicrons particles. Hence assessment of plasma apo A.1 and apo B allow an assessment of total number of anti-atherogenic and atherogenic particles respectively. LP(a) is modified from LDL in which apo A is bound to apo B. It is reported that apo B is a better predictor of cardio vascular events than LDL-C; and apoB/apoA ratio is a strong risk factor for cardio vascular diseases (CVD). In a study conducted to find out relation between lipid profile and rheumatoid arthritis, it was found that atherogenic lipid abnormality was often seen in patients with rheumatoid arthritis. It is also hypothesized that, rising lipid profile might be related to the development of RA by a common or linked background. This could be due to socio- economic (including dietary) or a genetic background. Alternately lipids might modulate the susceptibility to the development of inflammatory diseases such as RA.

The LDL levels are quite abnormal in RA which is associated with increased risk factors for cardio vascular diseases. When LDL becomes dense and concentrated, LDL gets oxidized and leads to a cascade of inflammatory process and ultimately causes atherosclerosis. The proinflammatory HDL is associated with elevated oxidized LDL and promotes inflammation. This process elevates phospholipids which will be great risk to cardio-vascular diseases.

It has been observed that relatively low values of dyslipidemia renders RA patients at three fold increased CVD risk. Patients with RA need stringent management of dyslipidemia which will benefit these patients by lowering the risk for development of various CVD. Lipid lowering drugs may have beneficial effects in RA as these drugs have anti-inflammatory and immune
modulatory properties also.

**Summary and Conclusion**

RA is an idiopathic, inflammatory disease and is associated with dyslipidemia in significant number of patients. RA associated dyslipidemia increases the risk for various cardio vascular diseases. Detection and management of dyslipidemia in RA should be part of routine management of RA patients. The findings of this study warrants further research involving larger cohort of RA patients because little is known about relation between inflammation and lipoprotein levels which determine the risk to cardio vascular disease in RA patients.

This research paper is approved by ethical committee of Medicit Institute of Medical Sciences (MIMS) Ghanpur, Medchal mandal and district Telangana-501401

No **Conflict of Interest**

No **Funding**

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Study of Prevalence of Migraine Associated with Cardio-Vascular Diseases in Women of Maharashtra Population

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¹Associate Professor, Department of Medicine. Prakash Institute of Medical Science, Urun Islampur; Sangli District Maharashtra, ²Professor and Head, Department of Microbiology Government Medical College Miraj (Maharashtra)

Abstract

50 adult females patients aged between 20-55 years old, having complaint of migraine were studied. Their associated clinical problems were obesity 7(14%), hypertensive 16(32%), D.M-9(18%), alcoholic 5(10%), usage of oral contraceptives 8(16%), insomnia 5(10%). Their previous history was hypertension 20(40%), hypcholesterolemia 14(28%), IHD.7(14%), stroke 5(10%), MI 4(8%). Their menstrual status was, normal menses patients were 15(30%), irregular menses 10(20%), menorrhagia 10(20%), oligomenorrhea 5(10%), premenopausal 5(10%) post-menopausal 5(10%). This study of migraine, associated with cardio-vascular diseases will be quite helpful to physician, cardiologist and endocrinologist because etiology of migraine is still obscure.

Keywords- Migraine, IHD= Ischemic heart disease, MI= Myocardial infaction

Introduction

Migraine is a primary headache disorder which mainly affects the women than men i.e. women are affected three to four times more than men (1)(2). Migraine is a specially migraine with aura , has been consistently associated with increased risk of stroke, including both ischemic and hemorrhagic subtypes. (3)(4) Although pathophysiology of migraine has close links with the vascular system, the mechanism by which migraine increases the risk of stroke remains unclear(5). The probable factors could be endovascular dysfunction, increased thrombotic susceptibility. ** Many prospective studies have reported * association between migraine and * cardiovascular diseases including ischemic heart diseases and cardio vascular death. Hence attempt was made to evaluate the migraine and associated diseases of cardio vascular system in females of different age groups so that such patients can be treated efficiently to avoid the cardio vascular death.

Material and Method

50 adult female patients aged between 20 to 55 years old, having complaint of migraine who were regularly visiting Prakash Institute of Medical Sciences Urun Islampur-415409, Sangli District Maharashtra* were selected for study. These patients had migraine with different complaints like unilateral pain, some had throbbing pain, aggravated by movement , nausea, vomiting, photophobia.*

Other associated findings were hypercholesterolemia, D.M, use of oral contraceptive, alcoholism. These women with migraine mainly associated with cardiovascular disease like IHD, MI.* It was confirmed by ECG, echocardiography and angiography, moreover lipid profile, Troponin test were also carried out and treated accordingly. The duration of study was about 2 years and 8 months.
Observation and Results

Table-1: Study of migraine patients associated with different clinical problems

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Particular</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Obese</td>
<td>07</td>
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</tr>
<tr>
<td>2</td>
<td>Hypertensive</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>D.M</td>
<td>09</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Alcoholics</td>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Usage of oral contraceptive</td>
<td>08</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>Insomnic</td>
<td>05</td>
<td>10</td>
</tr>
</tbody>
</table>

Table-1: Study of migraine patients associated with different clinical problems. Obese females were 7 (14%), hypertensive were 16(32%), D. M were 9(18%), alcoholic were 5(10%) Insomnic were 5(10%) females using oral contraceptives were 8(16%)

Table-2: Study of previous history of migraine patients

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Particular</th>
<th>No. of patients</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>1</td>
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<td>2</td>
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<td>3</td>
<td>IHD</td>
<td>07</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Stroke</td>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>MI</td>
<td>04</td>
<td>08</td>
</tr>
</tbody>
</table>

Table-2: Study of migraine patients associated with hypertension were 20 (40%), females with hypercholesterol were in 14(28%), IHD were 7(14%), MI were 4(8%), stroke 5(10%).

Table-3: Menstrual status of women suffering with migraine

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Particular</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal menses</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Irregular menses</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Menorrhagia</td>
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<td>4</td>
<td>Oligomenorrhea</td>
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<td>5</td>
<td>Pre-menopausal</td>
<td>05</td>
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<tr>
<td>6</td>
<td>Post-menopausal</td>
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<td>10</td>
</tr>
</tbody>
</table>

Table-3: Menstrual status of women suffering with migraine. Female having normal menses were 15 (30%), irregular menses 10(20%), oligomenorrhea 5(10%), menorrhagia 10(20%), premenopausal 5(10%), post-menopausal 5(10%).

Discussion

In the present study of prevalence of migraine associated with CVD, the obese females were 16 (32%), females with diabetes mellitus were 9(18%), alcoholic were 5 (10%), females using of oral contraceptive were 8(16%), and insomnic were 5 (10).(Table-1). In this study, the previous history of hypertension was noted in 20 (40%) females, Hyper cholesterol were 14 (28%) IHD were 7(14%) stroke 5(10%) MI 4(8%) (Table-2). The menstrual status of women suffering with migraine was-- normal menses females were 15 (30%), irregular menses 10(20%) menorrhagia 10(20%), oligomenorrhea5(10%) premenopausal 5(10%) post-menopausal 5 (10%) (Table-3). These finding were more or less in agreement with previous studies. Increased thrombogenic susceptibility which enhance the thrombogenic action as a indicator of migraine which leads to inflammation of neuro –vascular bundle.

Moreover due to increased body mass index and hypercholesterol in women, the migraine is quite common in them, which correlates with CVD which aggravates, the hormonal secretions hence majority of the females have variation in the menstrual status (Table-3).
It can be also hypothesized that obesity, D.M, usage of contraceptives will have more cholesterol, which leads to hypertension, moreover insomnia causes anxiety, which also elevate the blood pressure and obstruct the release of neurotransmitters which causes inflammation* and results into migraine.

Obstruction or slow release of neurotransmitters may impair the release of endocrine glands, hence variation in the menses profile, D.M. is observed in the women suffering with migraine 9(18%).

Due to the variation or in-coordination between neurovascular flow and hyper cholesterolemia may lead to Ischemia, MI, and stroke in these patients.

Migraine with aura can be described as variation in the secretion of neurotransmitters such as GABA, dopamine, serotonin etc because migraine is mainly associated with depression. It is established fact that majority of Indian women are suffering with OCD (obsessive compulsive disorder) hence hypnotic drugs are used to treat migraine.

Hence it can be associated with depression, lethargy, elevated lipid profile which results into CVD.

**Summary and Conclusion**

The present study of prevalence of migraine associated with CVD in females of Maharashtra will be quite helpful to physician, cardiologist, psychiatrist and endocrinologist also because migraine is associated with many hormonal irregular secretions. Because exact cause and mechanism of migraine is still unclear the study warrants further hormonal genetic angiological neurological evaluation.

This research work was approved by ethical committee of Prakash institute of medical sciences, Urn Islampur-415409, Sangli (District) Maharashtra.

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Study of Respiratory Tract Infection in Diabetic Mellitus Patients of Maharashtra Population

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Abstract

90 patients (65 males and 25 females) aged between 32 to 60 years known diabetic suffering with respiratory tract infections were studied. Their habits were smoking 24(26.6%) tobacco chewers 20 (22.2%), alcoholic 19(21.1%), sedatives 6(6.6%), non-addicted patients were 21(23.3%). Their symptoms were cough 20(22.2%), fever 25(27.7%), breathlessness 8(8.8%), chest pain 6(6.6%), Anorexia 9(10%), haemoptysis 10(11.1%), weight loss. (13.3%), organism observed were mycobacterium 39(43.3%), pseudomonas aeruginosa 12(13.3%), influenza (H1N1) 10(11.1%), klebsiella pnemonia 9(10%). No pathogens in found in 20(22.2%). Radiological study had maxillary sinusitis 22 (24.4%), frontal sinusitis 8(88%), DNS 11(12.2%), allergic rhinitis 10(11.1%). Pulmonary infection 39(43.3%). Among infection bilateral infection was 20(22.2%), unilateral infection was 19(21.1%). In the lesion study of pulmonary was exudate was 19(21.1), nodular was 12(13.3%), cavity formation was 8(8.8%). Associated complications besides respiratory tract infections were vasculopathy 24(26.6%), retino pathy 16(17.7%), nephropathy 10(11.1%), neuropathy 6(6.6%), and no abnormal complication in 34(37.7%), patients. This study will be certainly helpful to physician, radiologist, pathologist and endocrinologist because respiratory tract infection in diabetes mellitus is characterized by alterations in host defense in the entire body. The D.M strongly associated with micro vascular and neurological complication.

Keywords – DM = Diabetes Mellitus Pulmonary, Respiratory Hyperglycemic

Introduction

Diabetes mellitus is a clinical syndrome associated with deficiency of insulin secretion or action. It is considered one of the largest emerging threats to health in the 21st century It is predicted that there will be 380 million persons with DM Globally in 2025(1) DM is associated with reduced response of T cells, neutrophil functions and disorder of humoral immunity. (2)(3) consequently. DM increases the susceptibility to infections like streptococcus pneumonia and influenza virus(4) and pulmonary tuberculosis which is multidrug resistant tuberculosis and that treatment failures and death are more frequent in these patients. In addition tuberculosis infection and treatment may complicate the glycemic control. The magnitude and duration of D.M is strongly associated with the severity of micro vascular and neurological complications.(5) The presence of these complications add to the risk of infections may also be based on conditions that interfere with normal clearance mechanism immune cells function. Hence attempt was made to study the symptoms, habits, organism involved in the respiratory tract infections in D.M Patients Moreover associated complications of DM Patients suffering with respiratory tract infections were also studied so that this study will be useful to physician to correlate or predict the possible complications and treat the patients efficiently.

Material and Method

90 patients (65 Male, 25 Females), who regularly

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visited Prakash Institute of Medical science and research Urun – Islampur Dist. Sangli (Maharashtra). The patients aged between 32 to 60 years were selected for the study as they were known diabetic and suffering with respiratory tract infections, they belonged middle socio – economic status. Most of them were smokers, alcoholic, tobacco chewers; sedative drugs addicted some were non-addicted to any habits. Apart from respiratory tract infection their associated complication due to uncontrolled diabetic were also noted. Among 90 Patients 70 Patients (77.7%) had uncontrolled and 20 patients (22.2%) had controlled diabetes mellitus

HIV Patients suffering with diabetes mellitus were excluded from the study. The ratio of male and females was 2.2 : 1. The duration of study was about three years.

**Observation and Results**

**Table – 1: Habits of Respiratory Tract Infected Patients of Maharashtra population**

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Particulars</th>
<th>No of Patients</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smokers</td>
<td>24</td>
<td>26.6</td>
</tr>
<tr>
<td>2</td>
<td>Tobacco chewers</td>
<td>20</td>
<td>22.2</td>
</tr>
<tr>
<td>3</td>
<td>Alcoholic</td>
<td>19</td>
<td>21.1</td>
</tr>
<tr>
<td>4</td>
<td>Patients on Sedatives</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td>5</td>
<td>Non – Addicted</td>
<td>21</td>
<td>23.3</td>
</tr>
</tbody>
</table>

**Table – 2: Symptoms of the respiratory tract infection in diabetic mellitus patients of Maharashtra population**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Symptoms</th>
<th>No of patients</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cough</td>
<td>20</td>
<td>22.2</td>
</tr>
<tr>
<td>2</td>
<td>Fever</td>
<td>25</td>
<td>27.7</td>
</tr>
<tr>
<td>3</td>
<td>Breathlessness</td>
<td>8</td>
<td>8.8</td>
</tr>
<tr>
<td>4</td>
<td>Chest pain</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td>5</td>
<td>Anorexia</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Haemoptysis</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>7</td>
<td>Weight loss</td>
<td>12</td>
<td>13.3</td>
</tr>
</tbody>
</table>

**Table – 3: Organism observed in Respiratory tract infection diabetic mellitus patients of Maharashtra population.**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Organism</th>
<th>No of Patients</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mycobacterium</td>
<td>39</td>
<td>43.3</td>
</tr>
<tr>
<td>2</td>
<td>Pseudomonas aeruginosa</td>
<td>12</td>
<td>13.3</td>
</tr>
<tr>
<td>3</td>
<td>Influenza (H1N1)</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>4</td>
<td>Klebsiella pneumonia</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>No pathogens (NAD)</td>
<td>20</td>
<td>22.2</td>
</tr>
</tbody>
</table>

NAD = No Abnormal Disease

**Table – 3** organisms observed in respiratory tract infection in diabetic mellitus patients.

Mycobacterium bacilli were 39(43.3%), 2. Pseudomonas aeruginosa 12 (13.3%), 3. Influenza (H1N1) 10 (11.1%) klebsiella pneumonia 9(10%) and 5-normal patients or without any pathologic patients were 20(22.2%)
Table – 4: Radiological study of respiratory tract infected Diabetic Mellitus patients in Maharashtra Population.

(Total No. of Patients : 90)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Infected location</th>
<th>No of Patients</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maxillary sinusitis</td>
<td>22</td>
<td>24.4</td>
</tr>
<tr>
<td>2</td>
<td>Frontal sinusitis</td>
<td>8</td>
<td>8.8</td>
</tr>
<tr>
<td>3</td>
<td>Deviated nasal septum</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td>4</td>
<td>Allergic rhinitis</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>5</td>
<td>Pulmonary infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bilateral</td>
<td>39</td>
<td>43.3</td>
</tr>
<tr>
<td></td>
<td>Unilateral</td>
<td>20</td>
<td>22.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19</td>
<td>21.1</td>
</tr>
<tr>
<td>6</td>
<td>Pulmonary lesion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exudative</td>
<td>19</td>
<td>21.1</td>
</tr>
<tr>
<td></td>
<td>Nodular</td>
<td>12</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>Cavity formation</td>
<td>8</td>
<td>8.8</td>
</tr>
</tbody>
</table>

Table – 5: Study of Associated complications in respiratory tract infected patients in diabetes mellitus in Maharashtra Population

(Total No. of Patients : 90)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Complications</th>
<th>No of patients</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vasculopathy</td>
<td>24</td>
<td>26.6</td>
</tr>
<tr>
<td>2</td>
<td>Retinopathy</td>
<td>16</td>
<td>17.7</td>
</tr>
<tr>
<td>3</td>
<td>Nephropathy</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>4</td>
<td>Neuropathy</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td>5</td>
<td>No abnormal complication (NAC)</td>
<td>34</td>
<td>37.7</td>
</tr>
</tbody>
</table>

NAC = No abnormal complication

Discussion

In the present study of respiratory tract infections in diabetic mellitus patients of Maharashtra smoking were 24(26.6%), tobacco chewers were 20(22.2%) alcoholic were 19(21.1%), on sedatives were 6(6.6%) and patients without any addictions were 21(23.3%) (Table-1) as already these patients have reduced immunity and habits like smoking, chewing tobacco, alcohol again curtails the immunity and patients would be more prone for infection whenever there is change in climate, food intake, etc. The symptoms of respiratory tract infected diabetic patients had cough 20(22.2%), fever 25(27.7%), breathlessness 8(8.8%), chest pain 6(6.6%), anorexia 9(10%), haemoptysis. 10 (11.1%), weight loss 12(13.3%) (Table – 2)

Organism observed in respiratory tract infected diabetic patients mycobacterium bacilli were 39(43.3%), pseudomonas aeruginosa were 12(13.3%), influenza (H1N1) were 10(11.1%) klebsiella pneumonia were 9(10%). Patients without any abnormal disease were 20(22.2%). (Table -3) In the radiological study of respiratory tract infected diabetes mellitus patients had maxillary sinusitis were 22 (24.4%), frontal sinusitis were 8(8.8%), deviated nasal septum were 11(12.2%) allergic rhinitis were 10(11.1%) pulmonary infected patients were 39(43.3%) among these patients unilaterally infected were 19(21.1%) and bilaterally infected were 20(22.2%), in the study of pulmonary lesions – exudative were 19(21.1%), nodular were 12(13.3%), and cavity formation were 8(8.8%). These findings were more or less in agreement with previous studies (6)(7)(8) It is suggested that, DM depresses the immune responses (eg. Chemotaxis, phagocytosis, and antigen presentation in response to all above mentioned) pathogens like mycobacterium, pseudomonas aeruginosa, etc infection and affecting T – cell function and proliferation) facilitating infection and progression to symptomatic diseases. Staphylococcal infections is a major pathogen in the etiology of both community acquired and nascomial pneumonia in DM patients.
Gram negative aerobes cause all community acquired respiration infections.\(^9\) Gram positive cocci. H. influenza associated with high risk of respiratory tract infection in DM patients.

Next to mycobacterium: in the present study the associated complication were vasculopathic patients were 24(26.6%), retinopathic were 16(17.7%), nephropathic were 10(11.1%) neuropathic were 6(6.6%), and patients with no abnormal complications were 34(37.7%), (table-5) These findings were more or less in agreement with previous studies\(^{10}\) Apart from mycobacterium these associated complication leads to morbidity and mortality. These complications are due to hyperglycemia which impairs wide range of functions in neutrophils and monocytes (macrophages). In addition to this DM alters the function of capillary endothelium, the rigidity of red blood corpuscles and changes oxygen dissociation curve which results into vascular, neural, nephropathic complications moreover, some medication may impair the host defense Eg. Calcium channel blockers may impair the phagocytic function where as digoxin may decrease the clearance of pnemocci from the lower respiratory tree, anti DM medication cause abnormalities in ciliary motility which causes upper respiratory infections like sinusitis, allergic rhinitis etc.

**Summary and Conclusion**

The present study of respiratory tract infection in DM patients of both sexes in Maharashtra is quite helpful to the physician, pathologist and radiologist to correlate the symptoms, clinical features and associated complications but this study demands further histopathological, genetic, molecular, radiological studies because exact interaction of host defense with respiratory pathogens is still obscure and specific pulmonary immune mechanisms in DM patients is yet to be known.

This research paper is approved by ethical committee of Prakash institute of medical sciences and research Urun – Islampur 415409, Dist. Sangli (Maharashtra)

**No Conflict of Interest**

**No Funding**

**References**

Study of Diabetic Neuropathy among Telangana Population

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Sangareddy, Telangana State

Abstract

90 known diabetic patients (48 females 42 males) aged between 30-68 years old of Telangana region were studied. The regional classification of diabetic neuropathy was, distal symmetrical peripheral neuropathy were 32(35.5%) proximal neuropathy were 18(20%) cranial and truncal neuropathy were 12(13.3%). Mononeuropathy multiplex were 28(31.1%), the clinical manifestation were cardio vascular were 25(27.7%), included HTN – 11(12.2%), tachycardia 9(10%) orthostatic hypotension 5(5.5%), Gastrointestinal were 27(30%) included oesophageal 6(6.6%), Gastroparesis 8(8.8%), Constipation 6(6.6%), diarrhea 7(7.7%). Genitourinary 23(25.5%) included Erectile dysfunction 7(7.7%), Neurogenic bladder 10(11.1%), Cystopathy 6(6.6%). Miscellaneous were 15 (16.6%) included sweating disturbance 6(6.6%), heat intolerance 5(5.5%), hypoglycemia 4(4.4%), Biochemical study included duration of D.M 1 to 4 year were 10(11.1%), 5 to 10 years were 32 (35.5%) more than 10 years were 48(53.3%), FBG – in 44(48.8%), patients had 197 to 210(mg/dl), 46(51.1%) patients had 211 to 232(mg/dl) HbA1c value in 42 (46.6%) patients had 8.89 to 9.10 (mg/dl) patients had 9.20 to 10.5(mg/dl). Total cholesterol in 41(45.5%) patients had 177 to 181 mg/dl, 49(54.4%) had 182 to 184 mg/dl. LDL levels in 38 (42.2%) patients 102 to 107 mg/dl. 52(57.7%) patients 108 to 111 mg/dl. Triglyceride level in 39(43.3%), was 149 to 152, 51(56.6%) patients had 153 to 158 mg/dl. Systolic BP in 46(51.1%) patients had 132 to 137 (mmHg) 44(48.8%) patients had 138 to 141(mmmHg). Diastolic BP in 43 (mmHg) (47.7%) patient had 83.8 to 85.2 (mmHg) 47(52.2%) patients had 86 to 90 (mm/Hg). This study will b quite useful to endocrinologist, physician to correlate the regional DN and its clinical manifestation, bio-chemical study to rule out the severity of disease and treat the patients efficiently.

Keywords : DM, DN, FBG, HbA1c, Telangana

Introduction

Diabetic neuropathy is (DN) is a common disorder and defined as sign and symptoms of peripheral nerve dysfunction in a patients with diabetes mellitus (DM) in whom other causes of peripheral nerve dysfunction have been excluded. These is a higher prevalence in India and associated with cardio vascular mortality. It needs hospitalization more frequently than other complications of diabetes. And also most common cause of nontraumatic amputation. Diabetic neuropathy accounts for silent myocardial infarction and shortens the little span because it impairs cardiovascular autonomic control in diabetes mellitus patients. All types of diabetic patients, insulin dependent diabetic mellitus (IDDM), non Insulin dependent diabetes (NIDDM) and secondary diabetic patients can develop neuropathy. The prevalence of neuropathy increases with the duration of diabetic mellitus.

Hence attempt was made to study the DN patients with various parameters so that endocrinologist, physician can treat such patients efficiently to prevent the risk factors of morbidity and mortality.

Material and Method

90 known diabetic patients (48 females, 42 male)
aged between 30-68 years old who were regularly visiting
Mamtha medical college Khummum, MNR medical
college and hospital Sangareddy 502294, Telangana
were selected for study. Each patient was studied with
their sign and symptoms, past history, duration of
diabetes mellitus, associated clinical manifestations,
their blood pressure (SBP, DBP) was recorded, FBG,
HbA1c test were carried out, moreover. Total cholesterol,
LDL triglyceride test were also carried out to know the
severity of DM, and DN. HIV and malignant patients
with DM were excluded from the study.

This study was done in two institutions of Telangana.
1 – Mamatha medical college Khumum & 2- MNR
medical college and Hospital Sangareddy. The duration
of study was about three years.

**Observations and Results**

**Table -1: Regional classification of diabetic neuropathy**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distal symmetrical peripheral neuropathy</td>
<td>32</td>
<td>35.5</td>
</tr>
<tr>
<td>2</td>
<td>Proximal neuropathy</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Cranial and truncal neuropathy</td>
<td>12</td>
<td>13.3</td>
</tr>
<tr>
<td>4</td>
<td>Mononeuropathy multiplex</td>
<td>28</td>
<td>31.1</td>
</tr>
</tbody>
</table>

Table: 1 Distal symmetrical peripheral neuropathy patients were 32 (35.5%) 2 - proximal neuropathic were 18(20%) 3- Cranial and truncal neuropathic were 12(13.3%) mono neuropathic multiplex patients were 28(35.5%).

**Table -2: Clinical manifestation of diabetic neuropathy**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cardio vascular</td>
<td>25</td>
<td>27.7</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>Tachy cardia</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Orthostatic Hypo tension</td>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td>2</td>
<td>Gastro intestinal</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Oesophageal dys-function</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>Gastroparesis</td>
<td>8</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>Constipation</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
<td>7</td>
<td>7.7</td>
</tr>
<tr>
<td>3</td>
<td>Geito Urinary</td>
<td>23</td>
<td>25.5</td>
</tr>
<tr>
<td></td>
<td>Erectile dysfunction</td>
<td>7</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Neurogenic bladder</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>Cysto pathy</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td>4</td>
<td>Miscellaneous</td>
<td>15</td>
<td>16.6</td>
</tr>
<tr>
<td></td>
<td>Sweating disturbance</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>Heat intollence</td>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>Hypoglycemia</td>
<td>4</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Table: 2 Study of clinical manifestation of diabetic neuropathy.
a) Cardiovascular patients were 25(27.7%) includes, Hypertension 11(12.2%) tachycardia 9(10%) orthostatic hypotension were 5(5.5%)

b) Gastro – intestinal patients were 27(30%) esophageal dysfunction patients were 6(6.6%), gastroparesis 8(8.8%), constipation 6(6.6%), diarrhea 7(7.7%).

c) Genito – urinary manifestations were 23(25.5%) Erectile dysfunction 7(7.7%) neurogenic bladder 10(11.1%) cystopathy – 6(6.6%)

Miscellaneous manifestations were 15(16.6%) included sweating disturbances 6(6.6%), heat intolerance 5(5.5%), hypoglycemia 4(4.4%)

Table 3: Biochemical study in diabetic neuropathy patients

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Duration DM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 to 4 year</td>
<td>10</td>
<td>11.1%</td>
</tr>
<tr>
<td></td>
<td>5 to 10 year</td>
<td>32</td>
<td>35.5%</td>
</tr>
<tr>
<td></td>
<td>More than 10 years</td>
<td>48</td>
<td>53.3%</td>
</tr>
<tr>
<td>2</td>
<td>FBG (mg/dl) – a 197 to 210</td>
<td>44</td>
<td>48.8%</td>
</tr>
<tr>
<td></td>
<td>B 211 to 232</td>
<td>46</td>
<td>51.1%</td>
</tr>
<tr>
<td>3</td>
<td>HbA1c (mg/dl)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.89 to 9.10</td>
<td>42</td>
<td>46.6%</td>
</tr>
<tr>
<td></td>
<td>9.11 to 10.5</td>
<td>48</td>
<td>53.3%</td>
</tr>
<tr>
<td>4</td>
<td>Total cholesterol (mg/dl)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>177 to 181</td>
<td>41</td>
<td>45.5%</td>
</tr>
<tr>
<td></td>
<td>182 to 184</td>
<td>49</td>
<td>54.4%</td>
</tr>
<tr>
<td>5</td>
<td>LDL (mg/dl)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>102 to 107</td>
<td>38</td>
<td>42.2%</td>
</tr>
<tr>
<td></td>
<td>108 to 111</td>
<td>52</td>
<td>57.7%</td>
</tr>
<tr>
<td>6</td>
<td>Triglyceride (mg/dl)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>149 to 152</td>
<td>39</td>
<td>43.3%</td>
</tr>
<tr>
<td></td>
<td>153 to 158</td>
<td>51</td>
<td>56.6%</td>
</tr>
<tr>
<td>7</td>
<td>Systolic BP (mmHg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>132 to 197</td>
<td>46</td>
<td>51.1%</td>
</tr>
<tr>
<td></td>
<td>138 to 141</td>
<td>44</td>
<td>48%</td>
</tr>
<tr>
<td>8</td>
<td>Diastolic BP (mmHg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>83.82 to 85.20</td>
<td>43</td>
<td>47.7%</td>
</tr>
<tr>
<td></td>
<td>86 to 90</td>
<td>47</td>
<td>52.2%</td>
</tr>
</tbody>
</table>

Table 3: Biochemical analysis of Diabetic neuropathic patients 1- duration of diabetic milletus (DM) patients – 1 to 4 years DM were 10(11.1%), 5 to 10 years were 32 (35.5%), more than 10 years were 48(53.3%).

2. Fasting blood glucose (FBG) value in 42 (46.6%), mg /dl. patients had 8.89 to 9.10, mg / g. 48(53.3%), patients had 9.20 to 10.5

3. HbA1c value in 42(46.6%) patients had 8.89 to 9.10, mg /dl. and in 48 (53.3%) patients had 9.20 to 10.5 mg / dl.

4. Total cholesterol value in 41(45.5%) patients 177 to 181, mg/dl. and in 49 (54.4%) patients had 182 to 184, mg / dl.

5. LDL value in 38(42.2%) patients had 102 to 107mg /dl. 52(57.7%) patients had 108 to 111. mg /dl.

7. Systolic B.P – in 46(515%) patients had 132 to 137(mmHg) 44(48.8%) patients had 138 to 141, (mmHg)
8. Diastolic BP: In 43 (47.7%) patients had 83.82 to 85.20 (mmHg), in 47 (52.2%) 86 to 90 (mmHg)

**Discussion**

In the present study of Diabetic Neuropathy (DN) in Telangana population. The regional classification of DN was distal symmetrical peripheral neuropathy patients were 32 (35.5%) proximal neuropathic were 18 (20%) cranial and truncal neuropaths were 12 (13.3%) Mono neuropathic multiplex were 28 (35.5%) (Table-1). These values were more or less in agreement with previous studies. Among these DN Distal symmetrical polyneuropathy is quite common (35.5%). It may be sensory or motor and may involve small or large fibres or both. Sensory impairment occurs in glove and stocking distribution and motor signs are not prominent. The sensory symptoms reach up to knee level before the fingers are involved because of length dependent dying back process. Fibre dependent axonopathy results in increased predisposition in taller people. Distal symmetrical polyneuropathic is further classified into large fibre and small fibre neuropathy. Large fibre neuropathy is characterized by painless paresthesia with impairment of vibration, joint position, touch and pressure sensations and loss of ankle reflex. In advance stage sensory ataxia may occur. Large fibre neuropathy results in slowing of nerve conduction, impairment of quality of life and activities of daily living. Small fibre neuropathy on the other hand associated with pain and temperature sensations which are often associated with autonomic neuropathy. About 15% diabetic patients experience persistent pain in DN. Pain in DN can be spontaneous or stimulus induced, severe or intractable. DN pain is typically worst in night can be described as burning, pins, and needles, shooting, aching, jabbling, sharp, cramping, tingling, cold, or allodynia. Some patients develop predominantly small fibre neuropathy manifesting with pain and paraesthesia early in the course of diabetes that may be associated with insulin therapy (insulin neuritis). Sometimes acute DN pain is associated with weight loss and depression and has been formed as diabetic neuropathic cachexia. This syndrome commonly occurs in men and can occur at any time in the course of both type -1 and type II diabetes. It is self limiting and responds to symptomatic treatment.

Diabetic autonomic neuropathy affects various parts of the body (Table-2) Cardiovascular 25 (27.7%), includes HTN 11 (12.2%) tachycardia 9 (10%), orthohypotension 5 (5.5%)

**GIT** – 27 (30%) includes oesophageal dysfunction 6 (6.6%), gastroparesis 8 (8.8%), constipation 6 (6.6%), diarrhea 7 (7.7%), Genito-urinary 23 (25.5%), includes erectile dysfunction 7 (7.7%) neurogenic bladder 10 (11.1%) cystopathy 6 (6.6%). Miscellaneous manifestations (16.6%) included sweating disturbance 6 (6.6%), heat intolerance 5 (5.5%), hypoglycemia 4 (4.4%) (Table-2) Because of diversity of symptoms autonomic DN often goes un-noticed by both patients and physician. Proximal DN includes thoracic radiculopathy and proximal diffuse lower extremity weakness that should be grouped under a single term diabetic polyradiculopathy, as these are diverse manifestations of the same phenomenon, root or proximal nerve involvement. The weakness of pelvio-femoral muscle occurs abruptly in step wise manner in severe DN even knee reflex is reduced or absent. Diabetic truncal neuropathy 12 patients (13.3%) is associated with pain and paresthesia in T4-T12 in chest or abdominal distribution. Bulging of abdominal wall may occur because of muscle weakness. Mono neuropathies had nerve entrapment than infarction hence carpal tunnel syndrome is three times more in DM patients than non-DM patients. Multiple DN had involvement of two or more nerves (28 patients 31.1%) and nerve infarction occurs because of occlusion of vasa nervorum and should be differentiated from systemic vasculitis. In DM viscosity of blood reduced due to hyperglycemia and many bio-chemical changes in blood occurred (Table-3)

**Summary and Conclusion**

The present study diabetic neuropathy among Telangana population is quite useful to endocrinologist, physician and pathologist to diagnose and treat the risk factors of DM patients. But this study demands further genetic, patho-physiological, nutritional and bio molecular study because exact mechanism of hyperglycemia with nervous system and neuromuscular junction is still unclear. Unfortunately the basic research of DN focused on carbohydrate metabolism, amino acids and lipids bio-chemical changes rather than nervous, neuro-vascular, neuromuscular junctions and neurotransmitters study

This research paper is approved by ethical committee of Mamatha medical college Khammam and MNR
medical college and hospital Sangareddy – 502294. Telangana State

No Conflict of Interest

No Funding

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Study of Level of Serum Magnesium in Bronchial Asthma Patients of Telangana Population

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Abstract

70 patients (45 males and 28 females) aged between 30 to 70 year old suffering with bronchial asthma and control or normal group of 70 volunteers who did not have any respiratory diseases were studied. The mean value of BMI in bronchial asthma patients was 24.5 (SD±0.62), in control group-7 was 26.4 (SD±1.065) ‘t’ test value was 17.2 (p <0.0 ) p value was highly significant. Mean value of FEV1, in bronchial asthma patients was 44.9 (SD±0.043) and in control group it 93,4 (SD±1.37), ‘t ‘ test was 27.9 (p<0.01) the p value was highly significant. The mean value of serum magnesium in bronchical asthma patients was 1.66 (SD±0.1) and in control group it was 2.27 (SD± 0.02) ‘t’ test was 35.62 (p<0.00) this study of comparison between BMI, FEV1 and S. magnesium will be certainly helpful to physician, chest-medicine, specialist to predict or explore other values by knowing any one value of studied parameter. So that bronchial asthma can be treated efficiently because bronchial asthma is an idiopathic and allergic disease.

Keywords : BMI, FEV1, S.mg, Telangana.

Introduction

Magnesium has been considered as an adjunct therapy for severe and life threatening asthma exacerbation. Magnesium can induce bronchial smooth muscle relaxation in dose- dependent manner by inhibiting calcium influx into cytosol histamine release from mast cells or acetylcholine release from cholinergic nerve endings. It also may increase bronchodilator effect of β2 agonist by increasing the receptor affinity. The usage of magnesium (Mg) was first reported by Okayama in 1936, by infusing in asthma patients. At the same time usage of nebulised Mg also gained scientific interests, as an adjacent therapy to improve pulmonary functions and reduce hospitalization of bronchial asthma patients. Hence attempt was made to study the levels of Mg in asthmatic patients and compared with normal healthy subjects. Physician can differentiate the severity of the diseases by knowing the levels of Mg and treat the patient efficiently and avoid the risk of morbidity and mortality.

Material and Method

70 patients 42 males 28 females aged between 30 to 70 years old suffering with bronchial asthma were selected for study. And healthy 70 volunteers who did not have any respiratory disease were selected for study as control (normal group)

Their previous and present history, occupations, duration of asthma was noted. Pulmonary function test was carried by using spirometry, peak expiration flow rate (PEFR). Forced expiatory volume (FEV) was noted. Venous blood was collected from each patient for study of serum magnesium, ESR AEC study. Collected blood was allowed to coagulate, then centrifuged to separate serum and kept at -20° in Effendorf tubes. Serum magnesium level was measured by using ELISA kit. Apart from this chest-x-ray, sputum for AFB investigation was also carried out in bronchial asthmatics. The bronchial asthma patients suffering with HIV, malignancy diabetes

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were excluded from the study. The studied parameters including BMI in both control group and bronchial asthma patients were compared statistically by using SPSS software. This study was carried out in two medical colleges of Telanagana, 1) Mamata Medical college Kummam and 2) MNR medical college Sangareddy (Telengana state). The duration of this study was about three years.

Observation and Results

**Table 1: Comparison of BMI values between Bronchial asthma patients and normal peoples**

<table>
<thead>
<tr>
<th>BMI</th>
<th>Bronchial Asthma</th>
<th>Controls (Normal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Mean</td>
<td>24.57</td>
<td>26.44</td>
</tr>
<tr>
<td>SD</td>
<td>0.62</td>
<td>0.65</td>
</tr>
<tr>
<td>Test statistic</td>
<td>( t=17.24 \text{ df}=68, P &lt;0.01 )</td>
<td></td>
</tr>
</tbody>
</table>

Statistically BMI values are significantly less in Bronchial asthma patients than normal peoples \( (p<0.01) \).

**Table 2: Comparison of FEVI values between Bronchial asthma patients and normal peoples**

<table>
<thead>
<tr>
<th>FEVI</th>
<th>Bronchial Asthma</th>
<th>Controls (Normal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Mean</td>
<td>44.99</td>
<td>93.49</td>
</tr>
<tr>
<td>SD</td>
<td>0.43</td>
<td>1.37</td>
</tr>
<tr>
<td>Test statistic</td>
<td>( t=279.74 \text{ df}=68, P &lt;0.01 )</td>
<td></td>
</tr>
</tbody>
</table>

Statistically FEVI values are significantly less in Bronchial asthma patients than normal peoples \( (p<0.01) \).

**Table 3: Comparison of S.Magnum values between Bronchial asthma patients and normal peoples**

<table>
<thead>
<tr>
<th>S. Magnum</th>
<th>Bronchial Asthma</th>
<th>Controls (Normal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Mean</td>
<td>1.66</td>
<td>2.27</td>
</tr>
<tr>
<td>SD</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>Test statistic</td>
<td>( t=35.62 \text{ df}=68, P &lt;0.01 )</td>
<td></td>
</tr>
</tbody>
</table>

Statistically S.Magnum values are significantly less in Bronchial asthma patients than normal peoples \( (p<0.01) \).

**Discussion**

In the present study of level of serum magnesium among Telangana population BMI mean value in bronchial asthmatics patients was 24.54 (SD=0.62) and in controlled group it was 26.44 (SD=0.65) ‘t’ test value was 17.24 difference was 68 \( (p<0.01) \) p value was highly significant (Table-1).

The FEV mean value in bronchial asthmatic patients was 44.99 (SD= 0.043) and controlled group it was 93.49 (1.137) ‘t’ test value was 279.7 difference value was 68 \( (p<0.001) \) p value was highly significant (Table 2).

The level of Serum Mg, mean value in bronchial asthma patients was 1.66 (SD±0.14) and controlled group it was 2.27 (SD±0.02) ‘t’ test value was 35.6 difference was 68 \( (p< 0.01) \) The P value was highly Significant (Table-3). These obtained value were more or less in agreement with previous studies(56).

Serum magnesium plays vital role in the pathophysiology of allergic reactions especially in bronchial asthma(7). Contraction and dilation of myofibrillar proteins in smooth muscles of bronchi are due to the
phosphorylation and de-phosphorylation process which includes enzymes myosin kinase and myosin phosphates. Myosine kinase is magnesium dependent and myosine phosphatase is calcium dependent enzyme. Since magnesium is involved in calcium transport across the cellular membrane, both enzymes directly or indirectly influenced by magnesium (S.Mg) level\(^8\). Hence S.Mg plays vital role in contraction and dilatation of muscles of broncho-alveoli. Therefore reduction in S.Mg level leads to hyperactive of broncho- alveoli. Thus there will be aggravation of respiratory movement usually observed in bronchial asthma and there is reduced FEV\(_1\) level also (Table-2,3). It was proved that S.Mg level 2gm is ideal to treat the bronchial asthma S.Mg is also used as tocolytic agent for preterm labor, given I.V route up to 6gm/dl but continuous infusion may cause major toxicity when S.Mg is at 9 gm/dl and above causes loss of reflexes, blurred vision, lethargy muscle weakness, pulmonary Oedema\(^9\). In the case of hyper magnesium level hemodialysis was done to prevent high risk to renal function. Hence nebulised Mg is proved more efficient to control or relive from episodes of bronchial asthma as adjacent dosage. Treatment of altered Mg++ status depends on the clinical setting and may include the addition of a potassium/mg++ sparing drug to an existing diuretic regimen.

S.Mg is a cofactor of over 300 intracellular enzymatic reaction utilizing high energy phosphate bounds, magnesium has been implicated in smooth muscle contraction. Apart from relaxing bronchial smooth muscle it has calcium channel blocking properties, inhibition of cholinergic neuromuscular transmission with decreased sensibility to the depolarizing action of acetylcholine and stabilizing the mast cells, T-lymphocytes\(^10\), stimulation of nitric oxide and prostacyclin.

**Summary and Conclusion**

The present study of S.Mg in bronchial asthma patients among Telangana population is quite helpful to physician to treat the bronchial asthma with S.Mg as an adjacent dosage for relaxation of hyper activity broncho alveoli. This study suggests there is a strong relationship between intracellular Mg levels and methacholine bronchial reactivity. Hence Mg level alterations may play a role in the pathogenesis of bronchial asthma. But this study demands further patho- physiological, genetic, bio molecular, nutritional study to throw more light upon this subject because exact intracellular action of S.Mg on smooth musculature of broncho-alveolar is still unclear.

This paper was approved by ethical committee of MNR medical college sangareddy – 502294, Telangana

**No Conflict of Interest**

**No Funding**

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Study of Risk Factors in Type -2 Diabetes in Both Sexes of Maharashtra Population

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Abstract

Out of 90(ninety) type -2 diabetics 45were males and 45 were females. The age of the both sexes was about between 40-60 years old. The various parameters like * systolic blood pressure, diastolic blood pressure, diabetic retinopathy, diabetic foot, hypercholesterolemia & lipid disorders, cardiovascular diseases like IHD were studied . In the systolic blood pressure study, hypertensives * 32(71%) were males, 30(66.6%) were females.while in diastolic hypertensives, 22(48.8%)were males, 18(40%) were females. In diabetic retinopathy 5(11.1%) were males, 6(13.3%) were females. In the diabetic foot, males were 4(8.8%) and females were 3(6.6%). The duration of diagnosis of type-2 diabetes varied from 7 to 3 years. 12(26.6%) were males, 15(33.3%) were females-diagnosed 7 years back ; 24(53.3%)were males, 22(48.8%)were females-diagnosed 5 years back ,while 9(20%) were males, 8(17.7%) were females-diagnosed 3 years back. Increased level of cholesterol was observed:-31(68.8%) were males,33(73.3%) were females. Increased triglyceride level was observed :- 30(66.6%)were  males,35(77.7%)  were  females. Increased LDL level was 7(15.5%) in males, 8(17.7%) in female . Decreased HDL level was 15(33.3%) in males, 13(28.8%) in females. Increased albumin excretion was 4(8.8%)in females. and other CVD were 7(15.5%) in males, and 6(13.3%)in females. this study of risk factors in type diabetic will be helpful to physician ,cardiologist and endocrinologist to avoid premature mortality of such patients because excess mortality was noted even in patients without hypertension and increased lipid profile

Keywords – type:2 diabetes , CVD=cardio vascular disease HTN =hypertension HDL,LDL

Introduction

Type -2 diabetes is one of the major cause of mortality and morbidity in India and abroad as well. 19.8% of men and 24.8% of women deaths occur due to diabetes(2) Heart disease is the major cause of death associated with diabetes(3)(4). The prevalence of type -2 diabetes is increasing quickly in developing countries like India because of changes in life style which have occurred in last decades. According to estimate provided by the world health organization (WHO), by the year 2025 more than 75% of people with diabetes will be living in the developing countries.(5) The majority of the people with the type -2 diabetes are aged between 40 to 65 years that correspond to the most productive period of their lives. Better management of disease has resulted in the longer survival of patients with type -2 diabetes. As type_2 diabetes is associated with obesity,CVD, * various parameters were used to rule out the severity of the type- 2 diabetes so that the risk factors can be treated efficiently and the life span of type-2 diabetes patients can be prolonged for longer time.

Materials and Method

45 males and 45 females of know type -2 diabetic patients (total 90 patients) who were regularly visiting Prakash Institute Of Medical Sciences, Urn- Islampur 415409(Maharashtra) were selected for the study . The
age of the patient in both sexes was about 40-60 years. The biochemical examination—fasting glucose, HBA1c, total cholesterol, triglyceride, high density lipoprotein (HDL), low density lipoprotein (LDL) S-CK MB, S. troponin-1 test were carried out to rule out cardiac diseases. Visual examination was also done to find out diabetic retinopathy. The blood pressure of the patient was also recorded (DBP SBP). Moreover their family history of diabetes and cardiovascular diseases were also noted. The duration of this study was about three years.

Observation and Result

Table -1: Study of various parameters In type –II diabetes patients of both sexes

<table>
<thead>
<tr>
<th>SL. NO</th>
<th>Particular</th>
<th>Males (45 patient)</th>
<th>Percentage (%)</th>
<th>Females (45 patient)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SBP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a)hypertension</td>
<td>32</td>
<td>71.1</td>
<td>30</td>
<td>66.6</td>
</tr>
<tr>
<td></td>
<td>b)normal</td>
<td>13</td>
<td>28.8</td>
<td>15</td>
<td>33.3</td>
</tr>
<tr>
<td>2</td>
<td>DBP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Hypertension</td>
<td>22</td>
<td>48.8</td>
<td>18</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>b) normal</td>
<td>23</td>
<td>51.1</td>
<td>27</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>Diabetic retinopathy</td>
<td>5</td>
<td>11.1</td>
<td>6</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>b) _normal</td>
<td>40</td>
<td>88.8</td>
<td>39</td>
<td>86.6</td>
</tr>
<tr>
<td>4</td>
<td>a) Diabetic foot</td>
<td>4</td>
<td>8.8</td>
<td>3</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>b) normal</td>
<td>41</td>
<td>91.1</td>
<td>42</td>
<td>93.3</td>
</tr>
</tbody>
</table>

Table -1. Study of various parameters in type -2 diabetes patients of both sexes were studied

Sl.NO.1-Blood pressure–systolic blood pressure (SBP)-(a)hypertension were 32(71.1%) in males, 30(66.6%) in females (b) normal 13(28.8%) in males, 15(33.3%) in females.

Sl.NO.2 – blood pressure-diastolic (DBP)-(a)hypertension 22(48.8%)in males, 18(40%) in females (b) normal 23(51.1%) in males, 27(60%) in females.

SL.NO.3 diabetic retinopathy were 5(11%) in males,6(13.3%) in females

Sl.NO.4-diabetic foot 4(8.8%) in males,3(6.6%) in females
Table-2: Base line data of Type-II diabetic patients of both sexes

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>particular</th>
<th>Males (45 patients)</th>
<th>Percentage (%)</th>
<th>Females (45 patients)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Duration Of Diabetes Diagnosed After A)7 Years</td>
<td>12</td>
<td>26.7</td>
<td>15</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>B)5 Years</td>
<td>24</td>
<td>53.3</td>
<td>22</td>
<td>48.8</td>
</tr>
<tr>
<td></td>
<td>C)3 Years</td>
<td>09</td>
<td>20</td>
<td>08</td>
<td>17.7</td>
</tr>
<tr>
<td>2</td>
<td>Cholesterol A)Normal</td>
<td>14</td>
<td>31.1</td>
<td>12</td>
<td>26.6</td>
</tr>
<tr>
<td></td>
<td>B)Increased</td>
<td>31</td>
<td>68.8</td>
<td>33</td>
<td>73.3</td>
</tr>
<tr>
<td>3</td>
<td>Triglyceride A)Normal</td>
<td>15</td>
<td>33.3</td>
<td>10</td>
<td>22.2</td>
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<tr>
<td></td>
<td>B)Increased</td>
<td>30</td>
<td>66.6</td>
<td>35</td>
<td>77.7</td>
</tr>
<tr>
<td>4</td>
<td>LDL A)Normal</td>
<td>38</td>
<td>84.4</td>
<td>37</td>
<td>82.2</td>
</tr>
<tr>
<td></td>
<td>B)Increased</td>
<td>07</td>
<td>15.5</td>
<td>08</td>
<td>17.7</td>
</tr>
<tr>
<td>5</td>
<td>HDL A)Normal</td>
<td>30</td>
<td>66.6</td>
<td>32</td>
<td>71.1</td>
</tr>
<tr>
<td></td>
<td>B)Decreased</td>
<td>15</td>
<td>33.3</td>
<td>13</td>
<td>28.8</td>
</tr>
<tr>
<td>6</td>
<td>Albumin Excretion A)Normal</td>
<td>41</td>
<td>91.1</td>
<td>40</td>
<td>88.8</td>
</tr>
<tr>
<td></td>
<td>B)Increased</td>
<td>04</td>
<td>8.8</td>
<td>05</td>
<td>11.1</td>
</tr>
</tbody>
</table>

Table-2: Base line data of type-II diabetic patients of both sexes

Duration of diabetes diagnosed
7 years -12(26.6%)in males, and 15(33.3%)in females
5 years -24(53.3%) in males, and 22(48.8%) in females
3 years -9(20%) in males, 8(17.7%) in females
Study of the cholesterol -31(68.8%) in males 33(73.3%) females had increased level of cholesterol
Triglyceride -30(66.6%) in males 35(77.7%) females had increased level
LDL level -17(15.5%) in males 8(17.7%) in females had increased level
HDL level – 15(33.3%) in males 13(28.8%) in females had decreased level of HDL
Excretion of albumin -4(8.8%)in males 5(11.1%) in females had significant excretion of albumin in the urine
Table-3: Cardio-vascular diseases in Type-2 diabetic patients of both sexes

<table>
<thead>
<tr>
<th>SL.NO</th>
<th>Particular</th>
<th>Males (45 patient)</th>
<th>Percentage (%)</th>
<th>Females (45 patient)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IHD(Ischemic Heart disease)</td>
<td>05</td>
<td>11.1</td>
<td>04</td>
<td>8.8</td>
</tr>
<tr>
<td>2</td>
<td>Other cardiovascular disease</td>
<td>07</td>
<td>15.5</td>
<td>06</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Table-3. In the cardiovascular study of type-2 diabetic patients IHD were 5(8.8%) in males, and 4(8.8%) in females and other cardiovascular disease were 7(15.5%) in males and 6(13.3%) in females.

**Discussion**

This study indicates that the disease was lately diagnosed, 12(26.6%) were males, 15(33.3%) females was diagnosed after 7 years. 24(53.3%) males 22(48.8%) females were diagnosed after 5 years and 9(20%) males 8(17.7%) females were diagnosed after 3 years (table 2) hence they were late to get proper treatment.

The blood pressure - systolic blood pressure was studied- 23(51.1%) were males, 18(40%) were female hypertension. While in diastolic hypertensive 23,(51.1%) were males, 27(60%) were females. Diabetic retinopathy were 5(11.1%) in males, 6(13.3%) were female patients. Diabetic foot was observed in 4(8.8%) in males, 3(6.6%) in females. These finding were more or less observed in previous studies.

In the present study increased cholesterol level was 31(68.8%) in males 33(73.3%) in females. Increased triglyceride was 30(66.6%) in males, 35(77.7%) in females. the LDL level was increased in 7(15.5%) in males, 8(17.7%) in females. decreased HDL Level was 15(33.3%)In males, 13(28.8%) in females. Increased excretion of albumin was 4(8.8%) in male patients and 5(11.1%) in female patients (table2). These finding were also more or less in agreement with previous studies. Moreover ischemic heart disease(IHD) was 5(11.1%) in male patients 4(8.8%) in female patients other CVD were 7(15.5%) in males and 6(13.3%) in females (tableNo3). These findings also more or less in agreement with previous studies. The cardiovascular disease is lesser in females could be due to better glycemic control among females as compared to males. High blood glucose level leads to oxidative stress and mitochondrial overproduction of superoxide which has been recognized in the pathogenesis of diabetic micro and macro vascular complication, leads to diabetic retinopathy, IHD and diabetic foot etc. As noted earlier changes in life style and carbohydrate and fatty food intake leads to increase in serum cholesterol and triglycerides which are significantly associated with CVD risk factors.

**Summary and Conclusion**

The present study of risk in type-2 diabetes in both sexes of Maharashtra population will be helpful to physician and cardiologist to prevent the risk factors in due course of time by treating such patients meticulously efficiently but this study demands further genetic and nutrition study because exact mechanism of genetic constitution for elevation of lipid profile, hyperglycemia blood pressure is still obscure.

This research paper is approved by ethical committee of Prakash Institute of Medical Science, Urn Islampur 415409 (Maharashtra)

No **Conflict and Interest**

No **Funding**

**References**


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Prevalence and Antithrombotic Management of Atrial Fibrillation in the Elderly Patients

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Abstract

Atrial fibrillation is associated with an increased risk of thromboembolic events like stroke which is a leading cause of morbidity and mortality worldwide. If AF is treated with anticoagulant therapy in selected patients, it improves outcome in such patients. Out of 200 elderly patients aged between 65 to 78 years of age selected for the study 30 patients (15%) were diagnosed as Atrial Fibrillation. Out of these 30 patients with AF 7(23.3%) were alcoholic, 6(20%) had generalized anxiety, 8(26.6%) had stressful life, 5(16.6%) were having over intake of salt and fatty food, 4(13.3%) were tobacco chewers. Seven patients (23.3%) were hypertensive, 5(10.6%) had Diabetes mellitus, 8(26.6%) had coronary heart disease, 4(13.3%) had hyperthyroidism, 3(10%) had abnormal cardiac valve, 3(10%) had peripheral arterial diseases. In the study of Bleeding risk scores Atria had – 3 anemic, 2 had severe renal disease, 1 was above 76 years of age, 2 had HTN. In HAS-BLED score 1 had HTN, 1 had abnormal liver or kidney function, 1 had stroke, 1 had bleeding, 1 was above 76 years of age, 1 had drug or alcohol abuse, In Hemorrhagic score 1 had hepatic or renal disease, 1 was above 75, 1 had reduced platelet count, 1 had re-bleeding, 1 had HTN, 1 was anemic, 1 had genetic factor, 1 had stroke. Aspirin and clopidogrel are in routine use as antithrombotic while heparin and various oral agents are widely used as anticoagulant. This study in elderly patient highlights the need for screening for detection and appropriate treatment of AF to prevent various embolic complications like stroke and mitigate the burden of high morbidity and mortality in such patients.

Keywords: AF= Atrial fibrillation, HTN = Hypertensive, DM=Diabetes mellitus VKAs= Vitamin K antagonist, OAC= oral anticoagulant

Introduction

Atrial fibrillation is a common disease in the elderly. Among patients with atrial fibrillation (AF) elderly patients have worse prognosis with higher mortality and major adverse cardiovascular events compared with subjects between 50 to 60 year.(1) The risk of stroke is increased four to five folds in patients with AF, particularly in elderly. AF contributes significantly to risk of symptoms, hospitalization, and stroke. Ischemic strokes associated to AF are more likely to be chronically disabled, bedridden, and require constant nursing care particularly in elderly.(2) Therefore, prevention of stroke is an important goal in these patients. In this context, anticoagulation should be considered for such patients. However age is not the only independent predictor of stroke in AF patients but also of bleeding (3). AF is a challenging issue in elderly subjects due to their high number of co morbidities including cardiovascular diseases, kidney diseases, cognitive disorders, falls and poly pharmacy(4). As a result, the management of these patients is challenging in most cases. Although the use of anticoagulants has increased in the last years, they are still underused in elderly population. Hence, attempt
has been made to find out appropriate management of patients with AF and provide some practical recommendation about controversial issues so that such patients can be managed more efficiently.

Material and method

Two hundred elderly patients aged between 65 to 78 years visiting Medicine department at Medicitii Institute of medical sciences and Hospital Ghanpur Medchal Mandal Telangana- 501401 were studied. These patients were being treated for peripheral vascular disease, HTN and other cardiovascular diseases. Out of these 200 patients, 30 patients (15%) were diagnosed and confirmed as AF. The history of individual patients was studied. All essential radiological, biochemical, ECG test were carried out to study AF and treated accordingly.

This is a cross-sectional observational study conducted over a period of three years from 2015 to 2018. Majority of patients belonged to middle socio-economic status. Most of them were alcoholic, tobacco chewers, and leading stressful life. The male female ratio was 2:1. Patients having HIV Infection and Malignancy were excluded from the study.

Observation and results

Table-1: History of AF elderly patients

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alcoholic</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>2</td>
<td>Generalized anxiety</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Stressful life</td>
<td>8</td>
<td>26.6</td>
</tr>
<tr>
<td>4</td>
<td>Over intake of salt and fatty food</td>
<td>5</td>
<td>16.6</td>
</tr>
<tr>
<td>5</td>
<td>Tobacco chewers</td>
<td>4</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Table-1 History of elderly patients with AF 7 (23.3%) were alcoholic, 6 (20%) had generalized anxiety, 8 (26.6%) had stressful life, 5 (16.6%) were having over intake of salt and fatty food, 4 (13.3%) were tobacco chewers

Table-2: Clinical manifestation of AF elderly patients

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Particulars</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hypertensive</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>2</td>
<td>Diabetes mellitus</td>
<td>5</td>
<td>16.6</td>
</tr>
<tr>
<td>3</td>
<td>Coronary heart disease</td>
<td>8</td>
<td>26.6</td>
</tr>
<tr>
<td>4</td>
<td>Hyperthyroidism</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>5</td>
<td>Abnormal valve defect</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Peripheral arterial disease</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

Table-2 Clinical profile of elderly AF patients 7 (23.3%) were hypertensive (HTN), 5 (16.6%) had diabetic mellitus (DM), 8 (26.6%) had coronary heart disease, 4 (13.3%) had hyperthyroidism, 3 (10%) had cardiac valve defects, 3 (10%) had peripheral arterial diseases.
Table-3: Study of bleeding risk scores in AF in elderly patients. (Total No. of patients=30)

<table>
<thead>
<tr>
<th>Atria</th>
<th>Score</th>
<th>HAS- BLEED Score</th>
<th>HEMORRAGES Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>3</td>
<td>HTN</td>
<td>Hepatic or renal Disease</td>
</tr>
<tr>
<td>Severe renal disease</td>
<td>2</td>
<td>Abnormal liver or</td>
<td>Older age (76 years)</td>
</tr>
<tr>
<td>Age &gt; 76 years</td>
<td>1</td>
<td>Bleeding (&gt; 76 year)</td>
<td>reduced platelet count or function</td>
</tr>
<tr>
<td>HTN</td>
<td>2</td>
<td>drug or alcohol abuse</td>
<td>Re- bleeding HTN Anemia Genetic factors stroke</td>
</tr>
</tbody>
</table>

Table-3 study of bleeding risk scores in elderly AF patients – In ATRIA scores- 3 were Anemic, 2 had severe renal disease, 1 was above 78, 2 had HTN. In HAS- BLED score 1 had HTN, 1 had abnormal liver or kidney function, 1 had stroke, 1 had bleeding 1 was above 76, 1 was drug or alcohol abuse. In hemorrhage score-1 had hepatic or renal disease 1 was above 75, 1 had reduced platelet count, 1 had re- bleeding, 1 had HTN, 1 was anemic, 1 had genetic factor and 1 had stroke.

HAS – BLED = Hypertensive, Abnormal liver or kidney function, stroke, Bleeding labile INR, Elderly, Drugs or alcohol

Table-4: Comparison of Thrombo embolic rate with previous studies

(Total No. of patients=30)

<table>
<thead>
<tr>
<th>CHADS Score</th>
<th>Friberg</th>
<th>Singer</th>
<th>Oleson</th>
<th>Present study</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.3</td>
<td>0.04</td>
<td>0.78</td>
<td>0.3</td>
</tr>
<tr>
<td>1</td>
<td>0.9</td>
<td>0.55</td>
<td>2.01</td>
<td>0.9</td>
</tr>
<tr>
<td>2</td>
<td>2.9</td>
<td>0.83</td>
<td>3.71</td>
<td>2.8</td>
</tr>
<tr>
<td>3</td>
<td>4.6</td>
<td>1.66</td>
<td>5.92</td>
<td>4.5</td>
</tr>
<tr>
<td>5</td>
<td>6.7</td>
<td>2.80</td>
<td>9.27</td>
<td>66</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>4.31</td>
<td>15.2</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>13.6</td>
<td>4.77</td>
<td>19.7</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>15.7</td>
<td>4.82</td>
<td>21.5</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>15.2</td>
<td>7.82</td>
<td>22.3</td>
<td>14.1</td>
</tr>
<tr>
<td>10</td>
<td>17.4</td>
<td>16.2</td>
<td>23.3</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Table-4: Thromboembolic rate is compared with previous studies.

The present study findings are more or less in agreement with previous studies.

CHAD= congestive heart failure, Hypertension, Age, Diabetes mellitus, stroke / transient heart attack/ thrombo embolism.

Discussion

Atrial fibrillation is associated with an increased risk of thromboembolic events like stroke which causes significant morbidity and mortality worldwide. If AF is treated with anticoagulant therapy in selected patients, it improves outcome in such patients. Appropriate patient selection is essential to ensure that benefits of anticoagulant therapy outweigh the risk of bleeding due to anticoagulant. The prevalence of AF varies from 0.5%−15% depending on studied populations such as age, gender, as well as geography. Aging is an important factor for the AF pathophysiology. In the present study
of AF in elderly patients 15% patients were found to have AF (30 patients out of 200). Clinical profile of these patients revealed that some of them had associated factors which contribute to incidence of AF like alcohol or tobacco use, stressful life and excessive use of fatty food. Besides AF some of the patients had comorbid conditions like HTN, DM, CAD, hyperthyroidism and peripheral vascular disease (Table-2). In the study of bleeding risk scores in ATRIA scores – 3 were anemic, 2 had severe renal disease, 1 was above 76, 2 were HTN, 1 had abnormal liver and kidney functions, 1 had stroke, 1 had bleeding, 1 was more than 76 years, 2 had HTN and 1 had-BLED score was 1 HTN 1 had Abnormal liver and kidney functions, 1 had stroke, 1 had bleeding, 1 was more than 76 year, 1 drug or alcohol abuse. In the hemorrhages score 1 had hepatic or renal disease, 1 was above 76 years 1 had reduced platelet count or function, 1 had re-bleeding, 1 was anemic, 1 had genetic disorders, 1 had stroke(Table-3). These findings are more less in agreement with previous studies.\(^{(5),(6)}\)

It has been observed that majority of elderly individuals with AF are less likely to receive oral anticoagulants (OAC) therapies as compared with their younger counter parts\(^{(8)}\) and when treated with vitamin k antagonist (VKAs), there is a relatively high rate of discontinuation resulting in a high rate of stroke or death. This under treatment of very elderly represents a paradox because older patients are at high risk of stroke and are more likely to need anticoagulant therapy compared with younger patients. There are many reasons for the under treatment of AF in the elderly, physician related factors, patient related factors, and practical aspect of therapy. The overriding concern, however is the fear of putting the patient at risk for major bleeding as a result of anticoagulant therapy, while the fear of leaving the patient open to stroke is of lesser concern.\(^{(9)}\) Numerous trials have documented the increased risk of stroke while also showing an increased risk of bleeding with OAC therapy.\(^{(10)}\) When major bleeding is increased due to anticoagulants in elderly patients, physicians may withhold therapy or prescribe Aspirin, a clearly less effective antithrombotic therapy but one that physicians feel is less likely to cause major bleeding. New direct oral anticoagulants are rapidly gaining acceptability for stroke prevention in AF. Direct oral anticoagulants have been shown to be more effective than aspirin in preventing embolism in patients with AF and the risk of bleeding is not increased.\(^{(11)}\)

It is worth to recognize that elderly with AF have higher risk of stroke than those of youngsters. Therefore detection and appropriate management of AF with thromboembolic prophylaxis is essential in such patients. Acts of omitting anticoagulant therapy are more serious that acts of committing the therapy with anticoagulants in selected patients with AF.

**Summary and Conclusion**

The present study of AF in elderly patients highlights significant prevalence of AF especially in elderly population. There is need for careful screening programme to detect and appropriately treat AF to prevent various thromboembolic complications like stroke. It will greatly reduce the incidence of AF related morbidities and mortalities. Anticoagulant therapy in AF leads to risk reduction for primary as well as secondary prevention of thromboembolism particularly in elderly people. The use of guide line recommended stroke scoring systems in combination with a bleeding risk factor assessment can help to determine the net clinical benefits of anticoagulant therapy in older adults with AF. There is need for a larger study to understand the implications of use of anticoagulant in patients with AF.

This research paper is approved by ethical committee of Mediciti Institute of Medical Sciences (MIMS) Ghanpur, Medchal Mandal (dist) 501401 Telangana

No **Conflict of Interest**

No **Funding**

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The Impact of Artificial Intelligence on Healthcare

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Abstract

The question on many lips is: Will Artificial Intelligence(AI) replace human doctors? It is already apparent that AI will be able to assist clinicians in making superior decisions clinically. AI can harvest the latest medical knowledge from literature, thereby assisting in the endeavor to provide optimal patient care by assisting physicians. AI can help significantly in the reduction of human diagnostic and therapeutic errors. Important legislations that regulate patient data, like the European Union’s GPDR and the HIPAA in the US, are very protective of patient privacy. These laws require hospitals to keep certain kinds of data within local systems, thereby limiting what can go up to servers in the cloud. The need of the hour is a solution that will fulfil 3 conditions: 1. It must keep health information safe. 2. It must be able to leverage the advantages provided by the crowd. 3. It must be compliant with the privacy regulations of the government.

Key words: Artificial intelligence, healthcare.

Introduction

The success of AI in healthcare can be attributed to the fast growing accessibility of healthcare data, combined with the quick development of analytic methods in big data.¹-³ AI is capable of “learning” features from very large quantums of healthcare data, which it then uses to glean insights to be implemented in clinical practice. AI has the capacity to improve its accuracy by using feedback to learn and self correct. AI can harvest the latest medical knowledge from literature, thereby assisting in the endeavor to provide optimal patient care by assisting physicians. AI can help significantly in the reduction of human diagnostic and therapeutic errors.³,⁴,⁵,⁸ More specifically, at the stage of diagnosis, a significant amount of AI literature analyses data from electrodiagnosis, genetic testing and diagnosis imaging.

In the analysis of diagnostic images that have substantial data information, radiologists have been advised to use AI technologies.⁹

Types of AI

AI devices fall into two main categories: Machine Learning (ML) and Natural Language Processing (NLP). ML analyses structured data like genetic and imaging data. ML clusters the traits of patients and assesses the disease outcome probability.¹⁰ In contrast, NLP analyses unstructured data like medical literature and clinical notes. NLP aims to turn texts to machine readable structured data, which is then amenable to analysis by ML.¹¹

Epidemiological focus

AI literature in healthcare is mostly focussed on heart disease, cancer and nervous system disease. A double blinded validation study has shown that the IBM Watson for oncology, which is an AI system, is reliable in providing assistance in diagnosing cancer.¹² In quadriplegic patients, the control of movement has been
restored through an AI system. The Arterys cardio DL application uses AI to provide automated, editable ventricle segmentations based on conventional cardiac MRI images. The focus on these three medical areas is to be expected. They are leading causes of death. Early diagnoses are critical to preventing or delaying disease associated mortality and morbidity. These medical areas are more amenable to early diagnoses by improvements in imaging, genetics, and EMR, which are the strengths of the AI system. AI has also been used in the diagnosis of congenital cataract disease and diabetic retinopathy.

**AI devices**

AI devices are of three types: 1. Classical ML techniques. 2. Deep learning techniques. 3. NLP

Classical ML: This involves the construction of algorithms for data analysis. Patient traits and medical outcomes of interest are examples of inputs to these algorithms. Patient traits include baseline data like age and gender, and disease-specific data like clinical examination, medication history, signs and symptoms, radiological images, and gene expression. Examples for medical outcomes are patient survival times and tumor sizes. ML can be of three types: supervised, semisupervised, and unsupervised learning. A real-world example of supervised learning would be the task of grouping fruits in a basket. If the physical features of the different fruits are already known and the individual fruits in the basket are then grouped based on the prior knowledge of the physical features, it is supervised learning. Unsupervised learning would be where all the fruits are new to us, and we then proceed to classify them by giving each of them a particular name based on their physical features. Semisupervised learning is a mixture of supervised and unsupervised learning. A real-world example would be the development of a fraud detection model for a large bank. The bank might be aware of some instances of fraud, but not all of them. The bank can then label the dataset with instances of fraud that they are aware of, but the rest of the data will remain unlabeled. The bank can use a semi-supervised learning algorithm to label the data and retrain the model with the newly labeled dataset. The re-trained model is then applied to new data to identify fraud with a higher degree of accuracy, using supervised machine learning techniques. There is however, no way to verify that the algorithm would produce labels that are a hundred percent accurate. The outcomes from semisupervised learning techniques are therefore less trustworthy than the outcomes from traditional supervised techniques.

**Deep learning techniques**

Deep learning is a subset of machine learning. Artificial neural networks, which are algorithms inspired by the human brain, learn from large amounts of data. The term ‘deep learning’ comes from the fact that neural networks have multiple (deep) layers that facilitate learning.

**Natural language processing (NLP)**

ML algorithms can be operationalized straight away after ensuring adequate quality control, on genetic, image, and Electrophysiology (EP) data that are machine understandable. But there are large amounts of clinical information like discharge summaries, physical examination, operative notes, and clinical laboratory reports that are in the form of narrative text. This information is unstructured and incomprehensible for the computer program. NLP aims at extracting relevant data from the narrative text to facilitate better clinical decision making. The NLP pipeline has two parts: 1. Text processing 2. Classification. In text processing, a series of disease-specific key words are identified by NLP in the clinical notes from the historical databases. Validated keywords are used to enrich structured data and support clinical decision making.

NLP has been able to read chest X-ray reports and assist the antibiotic assistant system alert physicians to the possible need for anti-infective therapy. NLP has been proven to be capable of automatically monitoring laboratory-based adverse effects. Through the implementation of NLP on clinical notes, 14 cerebral aneurysms disease-associated variables were identified. These variables were successfully used to classify patients into two categories: Normal and those with Cerebral aneurysm disease. The accuracy rates were 95% and 86% on the training and validation samples respectively. The NLP was used to extract peripheral arterial disease-related keywords from narrative clinical notes. These keywords were then used to classify patients into normal patients and those with peripheral arterial disease. This was achieved with more than 90% accuracy.
AI in stroke

More than 500 million people across the world suffer some form of stroke each year. Stroke leads the list of causes of death in China. It is the fifth leading cause of death in North America. The global financial burden of stroke is enormous, to the tune of US$689 billion in medical expenses.\(^\text{24,25}\)

Early detection and diagnosis:

85% of stroke is caused by cerebral infarction, which is caused by a thrombus in the vessel. But only a few patients receive treatment on time because of the lack of detecting ability for early stroke symptoms. A movement detecting device for early stroke prediction has been developed.\(^\text{26}\) The implementation of two ML algorithms into the device was done for the model building solution. The algorithms are PCA and genetic fuzzy finite state machine. Neuroimaging techniques, especially MRI and CT, are important for disease evaluation and diagnosis of stroke. Naïve Bayes classification has been used to identify stroke lesion in T1-weighted MRI.\(^\text{27}\) The results are comparable with manual lesion delineation performed by human experts. Three dimensional CNN has been attempted for lesion segmentation in multimodel brain MRI.\(^\text{28}\) For the final post processing of the CNN’s soft segmentation maps, a fully connected conditional random field model was used.

Treatment of stroke

The prediction and analysis of the performance of stroke treatment has been done using ML. The prognosis and survival rate has a strong relationship with the outcome of intravenous thrombolysis, which is a critical emergency measure. The prediction of whether patients with TPA treatment would develop intracranial haemorrhage was done using SVM by CT scan.\(^\text{29}\) Whole brain images were used as input into the SVM. The performance was better than that for conventional radiology based methods. With the objective of improving the clinical decision making process of treatment with Tpa, a stroke treatment model was proposed. This model analysed clinical trials, practice guidelines and meta analyses using Bayesian belief network.\(^\text{30}\)

Outcome and prognosis:

The prognosis of stroke and disease mortality are affected by many factors. With the objective of providing better support to the clinical decision making process, a model for predicting the 3 month treatment outcome by analyzing physiological parameters in the 48 hours following stroke was proposed. This model uses logistic regression.\(^\text{31}\) A database of clinical information of 107 patients who underwent intra-arterial therapy for acute anterior or posterior circulation stroke was compiled.\(^\text{32}\) This data was analysed with SVM and artificial neural network. The prediction accuracy was more than 70%. ML techniques were used to identify factors that influence the outcomes in brain arteriovenous malformation treated with endovascular embolization, with 97.5% accuracy.\(^\text{33}\) An optimal algorithm has been used to predict 30 day mortality.\(^\text{34}\) This algorithm has been seen to have a higher predictive accuracy than existing methods. SVM has been used to predict stroke mortality at discharge.\(^\text{35}\)

Brain images have also been analysed to predict the outcome of stroke treatment. CT scan data has been analysed with ML to evaluate cerebral oedema after hemispheric infarction.\(^\text{36}\) With random forest, cerebrospinal fluid is automatically identified and shifts on CT scan are analysed. This has been proven to be more efficient and accurate than conventional methods. Functional connectivity was extracted from MRI and functional MRI data and ridge regression and multitask learning was used to predict cognitive deficiency after stroke.\(^\text{37}\) The relationship between lesions extracted from MRI images and the treatment outcome via Gaussian process regression model has been studied and this model has been used to predict the severity of cognitive impairments after stroke and the course of recovery over time.\(^\text{38}\)

Discussion

To be successful, an AI system must have the ML component to analyse structured data (genetic data, EP data, images) and the NLP component to mine unstructured texts. The sophisticated algorithms are then trained with healthcare data. The system is then ready to assist physicians with disease diagnosis and suggestions for treatment. In this field, the IBM Watson system is a pioneer. This system has both the ML and the NLP modules, and has made significant progress in oncology. Research shows that 99% of treatment recommendations from Watson are in line with decisions from physicians. Watson, in collaboration with Quest diagnostics, offers the AI genetic diagnostic analysis. This system is making an impact on actual clinical practices. Through the process of analyzing genetic data, Watson successfully identified...
a rare secondary leukemia in Japan. This leukemia is caused by myelodysplastic syndromes.

The CC Cruiser which is cloud based, can be used to connect an AI system with data input from the front end and clinical actions at the back end. Patient demographic information and clinical data is fed into the AI system. This data includes medical notes, images, blood pressure, EP results, genetic results etc. This data is then used by the AI system to suggest clinical decisions to physicians. Feedback on these AI suggestions is fed into the AI system so that it can keep continually improving.  

Regulations are currently an obstacle. At present, we do not have regulations that have standards to assess the AI systems safety and efficacy. The US FDA has made the first effort to fill this lacuna. They have attempted to provide guidance to assess AI systems. The first guideline has placed AI systems under the category of ‘general wellness products’. This category is loosely regulated for devices that are intended only for ‘general use’ and that pose negligible risk to consumers. The second guideline proposes that evidence be utilized to assess AI system performance. A third guideline sheds light on and gives clarity to the rules to be followed for the adaptive design for clinical trials. These trials would be used to assess the AI system operating characteristics. The first FDA approved deep learning clinical platform is Arterys’ medical imaging platform. This platform helps cardiologists diagnose cardiac diseases.  

The second barrier is data exchange. For good results, AI systems need continuous training with data from clinical studies. Continuous data supply is a challenge. The current system has neither incentives nor regulatory requirements for the sharing of data. The need of the hour is a legal and regulatory framework that can indemnify software companies. This framework needs to be able to approve new technologies. An algorithm, once it has received regulatory approvals, learns from more data, adapts and changes. This new learning cannot be used in clinical practice without securing updated approvals. The regulatory cycle is not yet equipped to adequately address the machine learning environment.  

Data privacy is another issue that needs to be addressed adequately. Important legislations that regulate patient data, like the European Union’s GDPR and the HIPAA in the US, are very protective of patient privacy. These laws require hospitals to keep certain kinds of data within local systems, thereby limiting what can go up to servers in the cloud. The need of the hour is a solution that will fulfil 3 conditions: 1. It must keep health information safe. 2. It must be able to leverage the advantages provided by the crowd. 3. It must be compliant with the privacy regulations of the government. In China and India, that have populations with a large patient to doctor ratio, the ability of AI to help doctors reach more patients can be a driver to include DL into the clinical process. There is a global demand for better healthcare. Many nations would want to leverage the benefits of AI.  

**Ethical Clearance**- Not applicable, as it is a Review of literature  

**Source of Funding**- Self funded.  

**Conflict of Interest** – Nil.  

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Workforce Diversity – Challenges in Inclusion of People with Disabilities in the Hospitality Industry

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Abstract

The existing literature on diversity, disability and employability points out towards social inequality and highlight the gaps that exist in the hospitality job market for people with disabilities. The nature of tasks and job roles in the hospitality sector has created unrealistic and problematic expectations for people with disabilities. The purpose of this paper is to identify the challenges faced by people with disabilities as far as employment in the Indian hospitality sector is concerned. In-depth interviews with ten managers belonging to ten different five-star hotels were conducted with the help of a semi-structured questionnaire. The responses were analyzed, transcribed, and common themes were identified. One of the significant findings of the study is that most of the hotels consider employing people with disabilities as a corporate social responsibility. Professional and social factors emerged as important challenges in the inclusion of people with disabilities (PWDs) in the Indian hospitality industry.

Keywords: People with Disabilities (PWDs); Employment; Hiring Practices; Challenges; Hospitality Industry

Introduction

Being employed is one of the vital tasks in the life of a common man1. But for disabled people work is more important and having any disability usually means isolation from society2,3 and work is the only moment to diminish that loneliness4. Being employed is mandatory to reduce isolation, but the disabled people have mostly specified that they feel ignored and hardly included in any activity of abled persons5. Hence, it is imperative that having a job is not enough, but merging socially with abled people is vital to give your best shot at work.

In terms of the level of education, people with disabilities (PWDs) tend to be less educated as compared to non-disabled people6. Subsequently, they also face challenges while searching for employment. Statistics from7 show that in some countries, unemployment among PWDs is 80 percent and more. On a global scale, 15% of the world population is of PWDs, and this is increasing because of chronic diseases as well as an ageing population8. In India, it is estimated that a total of 2.21% of the total population falls in the category of PWDs which is an increase of 0.8% since 2011 census9.

The present study aims at assessing the challenges faced by PWDs while searching for employment in the Indian hospitality industry. This paper attempts to study the responses and suggest solutions for increasing employability and sustainability for PWDs.

Review of Literature

Previous literature on PWDs suggests that for many human resource managers, it is a challenge to define and develop a complete understanding of what disability means10. Disability is generally associated as a stigma11 and the longevity of employment for PWDs is adversely affected by the lack of social acceptance by the non-disabled coworkers12, 13. Coworkers and employers attitude also create hindrances and difficulties at the
workplace for PWDs\textsuperscript{14,15} has listed financial implications of creating workplace accommodations, lack of employer’s awareness and “attitude of entitlement” as the reasons for low employment rate amongst PWDs. The entire employment cycle is governed by legislation on disability, yet PWDs face problems at their workplace during different stages of their employment\textsuperscript{16}. Study on hospitality employers conducted in Canada shows that employers are not aware as to how effective PWDs will be in a hospitality-related workplace and hence there is a need for greater education and understanding amongst hoteliers as far as employability of PWDs is concerned\textsuperscript{17}.

Available literature shows many studies in the domain of hiring and accommodating PWDs. The Theory of Planned Behavior\textsuperscript{18} is perhaps one of the most closely-knit theories as far as this topic is concerned. TPB provides detailed constructs on a wide range of employer perceptions relating to issues of hiring as well as making the workplace favourable for PWDs. The theory explains human behaviour as “a function of salient information or beliefs, relevant to the behaviour.” Since the perceived behavioural control may vary from situation to situation, hence TPB can be applied to a wide range of behaviours. Further, the seminal disability framework given by\textsuperscript{19} suggests and indicates towards the beliefs and a set of formal workplace activities that affect the treatment of PWDs at the workplace. The model presents a framework of factors that affect the treatment of PWDs in an organization. As per the model, the function of (i) individual attributed (of the disabled individual and that of the employer), (ii) business factors, for e.g.: regulations, legislation, and (iii) organizational features (values, norms, policies) affect the way PWDs may be treated in an organization. To reduce discrimination against PWDs,\textsuperscript{20} suggests that employee training from the stand-point of increasing awareness about PWDs as well as workshops on intergroup interactions can significantly be fruitful. Once hired, the human resource department of that organization should make sure that the employee with a disability is assigned to a suitable job role supported by a career development plan\textsuperscript{21}. Therefore, it becomes imperative to address the challenges faced by the hospitality businesses and systematically deal with them.

**Research Design/Method** – In-depth personal interviews were conducted using a Semi-structured questionnaire. This questionnaire was developed by the authors to gather and record vital information regarding the employment of PWDs and to let the respondents speak on the challenges and other issues unique to their respective organizations. During data collection, hotel human resource or training managers were approached as they are responsible for hiring, framing, and implementing policies aimed at the inclusion of PWDs in their respective organizations. Generally, the time allotted by the manager was forty to sixty minutes. Chandigarh Tri-City (located in north India) comprising of three cities, Chandigarh, Panchkula & Mohali was the area of study\textsuperscript{22,23,24}

**Response received from the respondents:**

Based on the responses received, it is found that out of 10 respondents, 5 of them had a policy in place. However, the other five were yet to frame a policy but were more than eager to employ PWDs in their organization. It was interesting to note and see the responses given by the hotel managers. On average, all hotels were in the medium to a large segment of hotels consisting of eighty-five to two hundred guest rooms with at least three to five food and beverage outlets. On average, the employee strength of each of these hotels was one hundred to two hundred full-time employees. The average age group of employees was twenty-four years to thirty-five years.

1. What percentage of the diverse workforce in the hotel belongs to PWDs and what kind of disability they have?
Table 1: Percentage of PWDs

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Result</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>20% of employees are with disability. It includes speech and hearing impaired, visually impaired, slow learners, and orthopedically impaired.</td>
<td>Limited Employment Opportunities for PWDs</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>2% of employees are with disabilities of speech and hearing.</td>
<td></td>
</tr>
<tr>
<td>Respondent 3</td>
<td>Three employees are with disabilities of speech, hearing and physically handicapped.</td>
<td></td>
</tr>
<tr>
<td>Respondent 4</td>
<td>Two employees with disabilities; one physically disabled while other was a slow learner.</td>
<td></td>
</tr>
<tr>
<td>Respondent 5</td>
<td>Three employees with disability, Orthopedically impaired, acid attack victim and LGBT (Lesbian, Gay, Bi-sexual and Transgender) respectively.</td>
<td></td>
</tr>
</tbody>
</table>

Limited employment opportunities for PWDs - Based on the response, the authors can say that generally number of PWDs employed is very less as compared to abled co-workers as depicted in Table 1. Only one respondent followed a mandate to employ 20% of the total workforce with PWDs, whereas all other respondents only employed 2-5 PWDs. Secondly, the common disability employed was either speech impaired, hearing impaired, and physically challenged. The author also got to know that one of the respondents considers and firmly believes that victims of acid attack and people from the LGBT community also needed social inclusion.

2. What steps have the organization taken to retain, promote, train & develop PWDs?

Table 2: Overall Development of PWDs

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Result</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>Similar KPIs for PWDs. For their skill improvement, the hotel has a tie-up with 2 Non-Government Organizations, Sai Swayam and Sarthak. The abled workforce is required to undergo Indian Sign Language Training and pass the evaluation with 70% marks.</td>
<td>Organizations’ versatility towards PWDs</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>Convenient and flexible shift timing. The organization trains PWDs using a unique employee disability kit.</td>
<td></td>
</tr>
<tr>
<td>Respondent 3</td>
<td>Well defined career path with promotion.</td>
<td></td>
</tr>
<tr>
<td>Respondent 4</td>
<td>Special sessions on hygiene and grooming.</td>
<td></td>
</tr>
<tr>
<td>Respondent 5</td>
<td>Training for the abled workforce on LGBT sensitization.</td>
<td></td>
</tr>
</tbody>
</table>

Organizations versatility towards PWDs - From the data in Table 2, the authors observed that the five respondents who have employed PWDs were flexible and adaptable to accommodate the special needs of PWDs. To retain, promote, and train PWDs, the organizations conducted continuous and regular training sessions for the PWDs as well as the non-disabled coworkers. Majority of the organizations adopted flexible working hours, equal increment, and assigned similar “key performance indicators” which were at par with that of non-disabled coworkers. Some organizations were associated with NGOs for specialized trainings, e.g. Indian Sign Language Training, which helps the non-disabled coworkers to adapt well with PWDs. An organization had also developed a unique kit which had a Name Badge, Menu Card, and useful equipment. Another organization conducted regular training and sensitization session on LGBT community for the entire workforce.
3. List any five challenges that the hotel faces in the operationalization of such policies and programs for PWDs.

**Table 3: Challenges in Inclusion of PWDs**

<table>
<thead>
<tr>
<th>Respondent 1</th>
<th>Result</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>PWDs are inflexible in following rules &amp; regulations of the organization.</td>
<td>Professional &amp; Social</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>PWDs need constant supervision. As per the organization, it is difficult to work with PWDs who belong to other states/cities.</td>
<td>challenges for the organization.</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>Social acceptability from the abled workforce was a challenge.</td>
<td></td>
</tr>
<tr>
<td>Respondent 4</td>
<td>Critical feedback from guests regarding employees with disabilities.</td>
<td></td>
</tr>
<tr>
<td>Respondent 5</td>
<td>The hotel is in the process of framing guidelines for hiring people from LGBT community.</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 brings out the Professional & Social Challenges faced by an organization. The authors learned from the respondents that generally PWDs were inflexible in following rules & regulations which were, at times, adjusted or made specially to accommodate the special needs of PWDs. The authors also learned that PWDs needed continuous supervision at work, which burdened the abled coworkers. The respondents also cited social acceptability & embarrassment for guests, career progression, and growth. The respondents also shared that longevity of employment in hiring PWDs was a concern, and when PWDs were given these special provisions, e.g., flexible working hours, the abled workforce felt deprived. A respondent was also in the process of framing guidelines for hiring of people from LGBT community.

4. What is the extent of support and assistance that the organization receives from external stakeholders like local government bodies and NGOs?

**Table 4: Support from Stakeholders**

<table>
<thead>
<tr>
<th>Respondent 1</th>
<th>Result</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>The organization has enlisted NGOs</td>
<td>Sources for recruitment &amp; skill development</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>The organization has enlisted NGOs</td>
<td></td>
</tr>
<tr>
<td>Respondent 3</td>
<td>Hotel’s own skill development vertical</td>
<td></td>
</tr>
<tr>
<td>Respondent 4</td>
<td>Tie-up with the local Gram Panchayat and the Village Sarpanch</td>
<td></td>
</tr>
<tr>
<td>Respondent 5</td>
<td>The organization has enlisted NGOs</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 details the sources for recruitment & skill development. The authors learnt that respondents had a healthy association with NGOs for recruitment and skill training of PWDs. Respondent number three had an in-house skill development vertical which imparted special training to PWDs whereas in the case of respondent number four, the local Gram Panchayat & the Village Sarpanch was also involved in the employment of PWDs.
5. Are there any benefits (organizational or financial) associated with employing PWDs?

Table 5: Benefits Acquired

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Result</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>CSR Activity</td>
<td>Need for a paradigm shift</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>CSR Activity</td>
<td></td>
</tr>
<tr>
<td>Respondent 3</td>
<td>CSR Activity</td>
<td></td>
</tr>
<tr>
<td>Respondent 4</td>
<td>CSR Activity</td>
<td></td>
</tr>
<tr>
<td>Respondent 5</td>
<td>CSR Activity</td>
<td></td>
</tr>
</tbody>
</table>

The need for a paradigm shift as far as workforce diversity is concerned is indicated in Table 6. Without any exception, all respondents shared that employing PWDs was a corporate social responsibility (CSR) and that there was no organizational or financial benefit associated with this.

6. Any other thoughts that you would like to share?

Table 6: Thoughts of Hotel Managers

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Result</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>Recognition of PWDs on World Disability Day</td>
<td></td>
</tr>
<tr>
<td>Respondent 2</td>
<td>The society needs to be more aware &amp; sensitive towards the needs of PWDs</td>
<td>Best practices and way forward</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>The organization creates opportunities for inter-company transfers across locations</td>
<td></td>
</tr>
<tr>
<td>Respondent 4</td>
<td>The respondent believes that all employees should be treated equally</td>
<td></td>
</tr>
<tr>
<td>Respondent 5</td>
<td>LGBT &amp; acid attack survivors should be included in the list of PWDs</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 brings out the Best Practices & Way forward as far as employing PWDs is concerned. From the responses received, the authors have learned that the employers of PWDs were concerned about career growth and the overall social well-being. PWDs employed in an organization were invited along with their families to employee recognition forum organized on the occasion of the World Disability Day. To encourage mobility and a sense of independence, an organization provided growth and promotion opportunity to PWDs by inter-organizational transfers to different locations. These initiatives keep PWDs motivated and loyal toward the organization and also have a favourable impact on the longevity of employees.

Major Findings and Conclusion

The results of the study have highlighted significant issues regarding the inclusion of PWDs in hospitality industry that need to be addressed. Firstly, as far as having a policy to employee PWDs is concerned, the analysis of the responses show that fifty percent of the respondents are yet to frame a policy and employee PWDs. It could be a significant step towards empowering and uplifting PWDs as getting employment will support PWDs financially as well as morally. Secondly, the non-disabled coworkers in hospitality organizations need to be made aware and sensitive towards the special needs of PWDs. Thirdly, to increase the coordination between employers and PWDs, the government at the local level may introduce schemes or create platforms for raising awareness on the issue of employment of PWDs. The responses show that employing PWDs is viewed as a corporate social responsibility. The authors believe that the findings related to employing of PWDs help in improving the current situation if organizations don’t just hire PWDs as an obligation. Addressing the paradigm shift from CSR can help in the overall integration and inclusion of PWDs in our society.

Implications and Future Scope

The study has future scope whereby further research can be conducted with a larger sample size of classified hotels across different cities. Quick Service Restaurants where expectations from employees and nature of work are not as demanding as classified hotels may also be included in further studies.

Ethical Clearance: No health intervention given

Source of Funding: Self

Conflict of Interest: Nil

References

1. Psychology EP, Vol D. Work in the 21st Century:


Awareness of HIV/AIDS among Drug users Visiting Government Run Out-patient Opioid Assisted Treatment (OOAT) centre in Amritsar city, Punjab

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¹Associate Professor, ²Professor, ³MD Chest and TB, District TB Officer, Amritsar, ⁴Professor and Head, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar

Abstract

Background: Drug abuse and HIV/AIDS are major health issues worldwide with an immense impact on human health. People who engage in drug use or high-risk behaviours associated with drug use put themselves at risk for contracting viral infections like HIV/AIDS. So, awareness among them is essential.

Methods: This cross-sectional study was conducted on all drug abusers visiting Outpatient Opioid Assisted Treatment (OOAT) centre from 1st April 2019 to 31st May 2019 and who had given consent for HIV testing. Awareness about HIV/AIDS was ascertained and valid conclusions drawn. Data management and analysis was done by using Microsoft excel and SPSS. Results: Out of 376 drug abusers, 349 (92.8%) were males and 27 (7.2%) were females. Educational status of the study subjects was significantly associated with the awareness about the disease. Conclusions: On statistical analysis, it was observed that 7.7% of the patients were HIV positive and educational status was significantly associated with the awareness about the various aspects of the disease (p<0.005).

Keywords: Drug abuse, HIV/AIDS, awareness, Socio-demographic factors.

Introduction

Drug abuse as well as HIV disease are a major health issues over various parts of the world. Worldwide, there were about 1.8 million new cases of HIV in 2017; among which young people aged 13 to 24 accounted for 21% of all new HIV diagnoses. Young people mostly include gay or bisexual men and who inject drugs.

Drug abuse has been linked to HIV (human immunodeficiency virus) and AIDS (acquired immune deficiency disorder) since the epidemic began in the 1970s. People who engage in drug use or high-risk behaviours associated with drug use put themselves at risk for contracting viral infections such as HIV/AIDS or hepatitis. It happens basically due to two reasons i.e. when people inject drugs and share needles or other drug equipment and when drugs impair judgment and people have unprotected sex with an infected partner. According to the CDC, one in ten HIV diagnoses occur among people who inject drugs and among females, 21 percent of HIV cases were attributed to intravenous drug users (IDU). Additionally, women who become infected with a virus can pass it to their baby during pregnancy, regardless of their drug use.

To halt the epidemic of HIV/AIDS epidemic we require a three pronged strategy: (a) prevention of drug abuse among young people; (b) provision and facilitation of access to drug abuse treatment; and (c) establishment of effective outreach to engage drug users in HIV preventive strategies that protect them and their partners from exposure to the virus and encourage the uptake of substance abuse treatment and medical care.
Over the last few decades, drug consumption has become one of the biggest problems affecting millions of children and youth in India. There are few states and cities in India which have taken the lead in drug consumption. Punjab in the Northern part of India has been facing a bane of drug epidemic over the last couple of decades. In 2015, a study commissioned by the Ministry of Social Justice and Empowerment (MoSJE), Government of India showed that the total number of drug users in Punjab are 2,32,856. In view of this problem, Government of Punjab started Out Patient Opioid Assisted Treatment (OOAT) centres in various districts of Punjab in the year 2017 where drug abusers could get treatment and routine tests free of cost. Seeing the gravity of problem the study was undertaken in an OOAT centre in Amritsar city and awareness of the drug abusers about HIV/AIDS was ascertained.

Material and Method

The study was a cross-sectional study conducted from 1st April 2019 to 31st May 2019 among all the drug users visiting in the Government run OOAT centre in Amritsar city and who had undergone HIV testing after their informed consent. The critically ill patients and who did not give informed consent were excluded from the study.

A total of 376 patients were included in the study. A pre-designed and pre-tested proforma was administered to the subjects after taking his/her consent. Questionnaire included questions regarding the sociodemographic profile, type of drug abuse and age at which they started drug abuse. Their HIV status was confirmed from the centre records and noted. A Questionnaire was also designed to assess the knowledge about HIV/AIDS keeping in view their risky behaviour and the valid conclusions were drawn.

Data analysis was done by SPSS version 20. Chi-square test was applied to prove their statistical significance and p<0.05 was considered to be significant.

Ethics: The research proposal was approved by the college ethical committee at the time of commencement of the study.

Results

The present study was carried out on 376 drug users visiting under Government run OOAT centre in Amritsar city. The sociodemographic profile, type of addiction, HIV status and knowledge about HIV/AIDS were ascertained. The total sample consisted of 349 (92.8%) males and 27 (7.2%) females.

Table 1 shows the distribution of cases according to their socio-demographic profile. Most of the patients were young i.e. 310 (82.5%) were less than 35 years of age. 56 (14.9%) and 10 (2.7%) were in the age groups of 36-50 years and >50 years. 92.8% were males and
only 7.2% were females. As far as their educational status is concerned, 144 (38.3%) were illiterate, 172 (45.7%) studied up to the secondary school or below and 60 (15.9%) were studied up to high school and above. Regarding occupation, 154 (41%) were labourers, 59 (15.7%) were drivers, 17 (4.5%) were doing business, 57 (15.2%) were in job, 23 (6.1%) were housewives, 12 (3.2%) were students and 54 (14.4%) were in other occupations or unemployed. Out of the total, 187 (49.7%) were married, 173 (46%) were single and 16 (4.3%) were included in others (widow/widower/divorced).

Table-2- Distribution of cases according to their type of addiction and HIV status

<table>
<thead>
<tr>
<th>Type of Addiction</th>
<th>No.</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous drug user (IDU)</td>
<td>170</td>
<td>45.2</td>
</tr>
<tr>
<td>Heroine</td>
<td>136</td>
<td>36.2</td>
</tr>
<tr>
<td>Oral drugs</td>
<td>64</td>
<td>17.0</td>
</tr>
<tr>
<td>Opium</td>
<td>6</td>
<td>1.6</td>
</tr>
<tr>
<td>Age at initiating drug abuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15 years</td>
<td>136</td>
<td>36.2</td>
</tr>
<tr>
<td>≥15 years</td>
<td>240</td>
<td>63.8</td>
</tr>
<tr>
<td>HIV Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-reactive</td>
<td>347</td>
<td>92.3</td>
</tr>
<tr>
<td>Reactive</td>
<td>29</td>
<td>7.7</td>
</tr>
</tbody>
</table>

It is evident from the table 2 that out of the total 376 cases, 170 (45.2%) were intravenous drug users, 136 (36.2%) were heroine addict, 64 (17%) used to take oral drugs and 6 (1.6%) were taking opium. 136 (36.2%) started drug abuse at < 15 years of age and 240 (63.8%) started at ≥ 15 years. Regarding their HIV status, 347 (92.3%) were non-reactive while 29 (7.7%) were found to be HIV positive.

Table-3- Distribution of cases according to their awareness about HIV/AIDS

<table>
<thead>
<tr>
<th>Heard about the disease</th>
<th>No.</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>266</td>
<td>70.6</td>
</tr>
<tr>
<td>No</td>
<td>110</td>
<td>29.2</td>
</tr>
<tr>
<td>Source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspaper</td>
<td>65</td>
<td>17.2</td>
</tr>
<tr>
<td>Television</td>
<td>104</td>
<td>27.6</td>
</tr>
<tr>
<td>Radio</td>
<td>50</td>
<td>13.3</td>
</tr>
<tr>
<td>Book</td>
<td>19</td>
<td>5.1</td>
</tr>
<tr>
<td>Other people</td>
<td>138</td>
<td>36.7</td>
</tr>
<tr>
<td>Infectious nature of the disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>291</td>
<td>77.2</td>
</tr>
<tr>
<td>No</td>
<td>85</td>
<td>22.5</td>
</tr>
<tr>
<td>Mode of spread (N= 291)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual</td>
<td>140</td>
<td>48.1</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>64</td>
<td>22.0</td>
</tr>
<tr>
<td>Intravenous injections</td>
<td>61</td>
<td>21.0</td>
</tr>
<tr>
<td>Sharing utensils/hands</td>
<td>24</td>
<td>8.2</td>
</tr>
<tr>
<td>Mother to child</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Curable nature of disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>230</td>
<td>61.2</td>
</tr>
<tr>
<td>No</td>
<td>146</td>
<td>38.8</td>
</tr>
<tr>
<td>Life threatening nature of disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>243</td>
<td>64.6</td>
</tr>
<tr>
<td>No</td>
<td>133</td>
<td>35.4</td>
</tr>
<tr>
<td>Duration of treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days</td>
<td>5</td>
<td>1.3</td>
</tr>
<tr>
<td>Weeks</td>
<td>78</td>
<td>20.7</td>
</tr>
<tr>
<td>Months</td>
<td>166</td>
<td>44.0</td>
</tr>
<tr>
<td>Years</td>
<td>127</td>
<td>33.7</td>
</tr>
<tr>
<td>Co-infection present with the disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>337</td>
<td>89.6</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>10.4</td>
</tr>
<tr>
<td>Name the common co-infection (n= 337)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>107</td>
<td>31.7</td>
</tr>
<tr>
<td>Jaundice</td>
<td>42</td>
<td>12.5</td>
</tr>
<tr>
<td>Diarrhoea/vomiting</td>
<td>71</td>
<td>21.1</td>
</tr>
<tr>
<td>Skin manifestations</td>
<td>28</td>
<td>8.3</td>
</tr>
<tr>
<td>Generalized weakness</td>
<td>89</td>
<td>26.4</td>
</tr>
<tr>
<td>Any means of protection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Perusal of table 3 shows the distribution of cases according to their awareness about HIV/AIDS. All the cases had heard about the disease and the source was newspaper in 65 (17.2%), television in 104 (27.6%), radio in 50 (13.3%), books in 19 (5.1%) and other people in 138 (36.7%) cases. Out of the total, 70.6% and 77.2% were aware about the infectious nature and the spreading nature of the disease respectively. Regarding the mode of spread, out of 291 cases who knew the spreading nature, according to 140 (48.1%), 64 (22%), 61 (21%) mode of spread was sexual, blood transfusion and intravenous injections respectively. 24 (8.2%) replied that disease spreads by sharing utensils and shaking hands and only 2 (0.7%) were aware about the mother to child transmission. 61.2% and 64.6% of the cases responded that the disease is curable and life threatening respectively. 166 (44%) replied that the duration of treatment is in months and 127 (33.7%) replied this in years, 78 and 5 cases replied this in weeks and days respectively. 337 (89.6%) knew that the co-infections are present with the disease out of which 107 (31.7%), 42 (12.5%), 71 (21.1%), 28 (8.3%) and 89 (26.4%) named the common co-infection as tuberculosis, jaundice, diarrhoea/vomiting, skin manifestations and generalized weakness respectively. Regarding the means of protection maximum cases i.e. 115 named condom use followed by blood check-ups (96), needle/syringe sterilization (79), avoiding commercial sex workers (37), single partner (33) and avoid pregnancy (2). 14 cases didn’t know any means of protection.

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Illiterate</th>
<th>Secondary School or below</th>
<th>Above Secondary School</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td>N(%)</td>
<td></td>
</tr>
<tr>
<td>Infectious nature of disease</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2=32.231$</td>
</tr>
<tr>
<td>Yes (n= 266)</td>
<td>78 (29.3)</td>
<td>136 (51.1)</td>
<td>52 (19.5)</td>
<td>df=2; p=0.000</td>
</tr>
<tr>
<td>No (n= 110)</td>
<td>66 (60)</td>
<td>36 (32.7)</td>
<td>8 (7.3)</td>
<td></td>
</tr>
<tr>
<td>Spreading nature of disease</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2=12.191$</td>
</tr>
<tr>
<td>Yes (n= 291)</td>
<td>98 (33.7)</td>
<td>141 (48.5)</td>
<td>52 (17.9)</td>
<td>df=2; p=0.002</td>
</tr>
<tr>
<td>No (n= 85)</td>
<td>46 (54.1)</td>
<td>31 (36.5)</td>
<td>8 (9.4)</td>
<td></td>
</tr>
<tr>
<td>Life threatening nature of disease</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2=10.828$</td>
</tr>
<tr>
<td>Yes (n= 243)</td>
<td>81 (33.3)</td>
<td>114 (46.9)</td>
<td>48 (19.8)</td>
<td>df=2; p=0.004</td>
</tr>
<tr>
<td>No (n= 133)</td>
<td>63 (47.4)</td>
<td>58 (43.6)</td>
<td>12 (9.0)</td>
<td></td>
</tr>
</tbody>
</table>
As is evident from the table 4 that those who were illiterate were less aware about the infectious nature of the disease, spreading of the disease, life threatening and curable nature of disease as compared to those who were educated upto secondary school or above secondary school. So, the educational status was significantly associated with the knowledge (p< 0.05) except knowledge about the co-infections where no association was observed.

## Discussion

Table 1 reveals the socio-demographic profile of the drug users. Our study showed that 82.5% of the cases were young i.e. <35 years and 92.8% were males. A similar study by Lin TY et al in Taiwan also reported the mean age of drug users was 36.1 years and 90.9% were men.

Our study showed that around 62% were literate, 76.4% were working and 49.7% were married. Almost similar results were observed in a study by Avasthi et al in Chandigarh that most of the respondents were males in their early 30s, educated up to middle level. About were married, and most were employed. A study conducted by MoSJE Government of India in Punjab in the year 2015 revealed that 89% of drug users are literate, 83% are working and 99% are males.

The present study (Table 2) depicts that most common type of abuse was intravenous drugs (45.2%) followed by heroine in 36.2% of cases. 63.8% of the cases started drugs at 15 years or more and HIV was positive among 7.7% of the cases. Jolley E et al in their systemic review observed that HIV prevalence varies from 5-10% and heroine is the most commonly used drug followed by others and intravenous route is followed mostly.

Table 3 presents the distribution of cases according to their knowledge about HIV/AIDS. All the drug users had heard about HIV and the common sources were other people and television followed by radio and newspaper. More than 70% knew about the infectious and spreading nature of the disease. Most common mode of spread was reported as sexual (48.1%) followed by blood transfusion (22%) and intravenous injections (21%). More than 60% knew about the life threatening nature of HIV and 80.6% knew about the co-infections and most common reply was tuberculosis. Condom use was the most commonly answered means of protection. Some of the similar results were seen by Bertoni N et al in Brazil.

As is evident in table 4 that that knowledge regarding infectious nature (p=0.000), spreading nature (p= 0.002), life threatening nature (p= 0.004) and curability (p= 0.019) among drug users was significantly associated with their educational status while knowledge about co-infections had no significant association. Chen B et al in their study also revealed education had significant effect on the HIV/AIDS knowledge awareness.

## Conclusion

There is a relative dearth of literature regarding drug abusers and their awareness about HIV/AIDS as they comprise the high risk group. Moreover, knowledge was found to be significantly associated with the educational status so counselling should be reinforced. Comorbid medical and psychiatric conditions and complex cofactors such as poverty, access to care, and psychosocial variables make assessment and interpretation of results challenging.

### Source of Funding: Nil.

### Conflict of Interest: None

### References

1. CDC. Viewed on 29th June 2019. Available at https://
www.cdc.gov/hiv/basics/statistics


Diagnosis and Management of Multiple External Inflammatory Root Resorption of Maxillary Central Incisor Using Cone Beam Computed Tomography – A Case Report

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Abstract

Avulsion and replantation of the teeth following traumatic injury causes complication such as inflammatory and replacement resorption. This case report describes a traumatic injury to the permanent maxillary central incisor exhibited pulpal necrosis leading to periapical cyst with massive bone loss and extensive external inflammatory root resorption. Endodontic therapy and surgery was performed to salvage the tooth with poor prognosis. The multiple resorptive defects were debrided and restored with resin modified glass ionomer cement. The postoperative follow-up revealed improved healing. The prognosis of the tooth which was badly destructed due to external inflammatory resorption was greatly enhanced with appropriate treatment plan and ultimately increased the longevity of the tooth.

Key words: External Inflammatory resorption, CBCT, RMGIC

Introduction

External resorption is a progressive and destructive loss of tooth structure, initiated by a mineralized or denuded area of the root surface. External tooth resorption can be classified into surface resorption, external inflammatory resorption (EIR), external replacement resorption, external cervical resorption and transient apical breakdown. External resorption results as a most common complication after tooth replantation with a reported prevalence of 57- 80\%.\(^{[1]}\) The combination of bacteria in the root canal and cemental damage on the external root surface results in EIR.

The basic treatment for EIR is the elimination of bacteria from the root canal and/or dentinal tubules by endodontic therapy to arrest the resorptive process. Various approaches have been suggested for the treatment of external inflammatory root resorption like, nonsurgical root canal treatment combined with a calcium hydroxide dressing and MTA obturation. The surgical treatment of external inflammatory root resorption has generally involved periodontal flap reflection, curettage and restoration of the defect with amalgam, glass ionomer cements (GIC), resin modified glass ionomer cement (RMGIC), MTA or reverse sandwich restoration.\(^{[2]}\)

A case report of external inflammatory root resorption diagnosed using cone beam computed tomography, restored with resin modified glass ionomer cement is presented in this article.

Case report:

A 21-year-old male patient was referred to the Department of Conservative Dentistry and Endodontics...
with a complaint of pain in the upper right front tooth for the past 1 week. The patient gave the past history of a traumatic avulsion injury, followed by replantation within 20-30 min, 3 years earlier. The tooth was not transported in any storage media before replantation and root canal treatment was not performed following replantation.

There was no relevant medical history, and an intraoral examination revealed a mobility in #8 (grade II), #7 and #9 (grade I). After performing sensitivity tests, tooth #7, 8 and 9 was diagnosed as having pulpal necrosis. The teeth showed no discoloration [Figure 1], pain on percussion on #7, 8 and 9 and periodontal probing depths were physiological (<3 mm) at all sites except for the labial surface of #8 in which copious bleeding and periodontal pocket (7 mm) was found. Radiographic examination showed multiple irregular radiolucent areas invading the radicular dentin in both mesial and distal aspects of tooth #8, calcified canal in tooth #9 and periapical radiolucency involving teeth #8 and 9 [Figure 2]. The pulp canal and chamber spaces were regular and well defined in tooth #8 with interdental bone loss between teeth #8 and #9. A provisional diagnosis of external inflammatory resorption caused by avulsion of tooth #8, because of the associated necrotic pulp, pulpal necrosis with periapical pathology of teeth #7 and 8, calcified canal with periapical periodontitis of tooth #9 was made. Patient was advised to extract the tooth #8 considering the poor prognosis due to extensive bone loss. As the patient refused for extraction, further treatment was planned. After obtaining informed consent, the patient received local anesthesia of 2% lidocaine with 1:100,000 adrenaline (LOX 2%; Neon Laboratories Ltd, Mumbai, India). A rubber dam was placed, and the endodontic access opening was performed using Endo access bur no. A0164 (Dentsply Maillefer, Ballaigues, Switzerland) and slow-speed diamond KGS 3203 (Dentsply Maillefer) in tooth #7, 8 and 9. Due to the presence of pus discharge from the canals of the teeth #7 and 8, open dressing was given for a day. In order to determine the extent and depth of the lesion in three spatial levels, CBCT was performed. Based on CBCT images and three dimensional reconstructions [Figure 3A, 3B, 3C, 3D] a diagnosis of EIR and various resorption sites were confirmed. The patient was again informed of treatment plan alternatives, and poor prognosis of the case.

Then, a working length radiograph of teeth #7, 8 and 9 were taken after negotiation of the calcified canal of tooth #9. The root canals were gently irrigated using 3% sodium hypochlorite. The canals of teeth #7, 8 and 9 were prepared to size 55, 60 and 55 by using K-files. Calcium hydroxide intracanal medication was changed every week for a period of 1 month. Before obturation, intracanal irrigation was performed with 2% chlorhexidine and sterile saline alternatively and a final rinse with 1 ml 1.25% sodium hypochlorite and 17% EDTA. The canal systems were dried with absorbent paper points and obturated by the lateral condensation technique with gutta-percha and AH plus sealer (Dentsply Maillefer) [Figure 4A]. The entrance filling for coronal seal was given with GIC (Fuji II, GC Corporation, Tokyo, Japan). Teeth #6, 7, 8, 9, 10, 11 were splinted together to establish stability during surgical procedure.

The surgical procedure was performed under local infiltration anesthesia (2% lidocaine with 1:100,000 adrenaline) on both the vestibular and palatal mucosa. An intrasulcular incision was made from the distal surface of the maxillary right canine to the distal surface of the maxillary left lateral incisor, and full-thickness mucoperiosteal flap was elevated. The periapical lesion was enucleated and histopathological findings confirmed it to be a periapical cyst. Surgical exploration revealed multiple resorptive lesions as observed in CBCT. Granulomatous tissue within the defect area was removed by curettage and 90% trichloroacetic acid solution on a cotton pellet was applied to the resorptive defect for coagulation necrosis. The root tip was resected, and retrograde preparation was performed using surgical ultrasonic tips (Satelec Acteon Cor, Mérignac, France) and P Max surgical micromotor with ultrasonic generator (Satelec Acteon Cor, Mérignac, France). After isolation, only the easily accessed resorption areas were restored with RMGIC (Fuji II LC; GC Corporation, Tokyo, Japan) and the retrograde filling was performed using white MTA (ProRoot MTA, Dentsply Maillefer, Tulsa, OK). The flap was repositioned without tension and sutured interproximally with nonabsorbable sutures (Silk; Dogsan, Trabzon, Turkey). The sutures and splint were removed at the end of the first week, and the patient was asymptomatic [Figure 4B]. One year follow-up of the case did not reveal any progression of the resorption, and good bone healing was evident [Figure 4C]. Gingival healing appeared complete with normal probing depth, no gingival recession, no loss of clinical attachment and absence of mobility. The patient was asymptomatic, and the tooth was deemed healthy.
Discussion

External inflammatory resorption in this case has been induced following avulsion and replantation of the tooth. Replantation had been performed within 20 – 30 min following avulsion and the tooth had been exposed to dry environment throughout the time period. Although the ideal time to begin root canal treatment is 7–10 days post replantation in closed apex. The tooth was not root canal treated for 3 years. These are the reasons for the occurrence and progression of resorption. Although the treatment outcome of the tooth which is symptomatic, with excessive mobility and radiographic evidence of resorption is unfavorable, it was decided to salvage the tooth as the patient was not willing for extraction.

Cone beam computed tomography (CBCT) is a useful tool in endodontics. CBCT has been used to assess the extension of an EIR. In the present case, CBCT was used to observe the size and extent of the periapical lesion, size and location of the resorptive defect in the three spatial levels, as, CBCT seems to be useful in the evaluation of EIR, and its diagnostic performance was better than that of periapical radiography.

In this case, a combination of pulpal necrosis and calcification occurred following traumatic injury. The necrotic tissue of the offended teeth which was susceptible to bacterial contamination progressed to cause the periapical cyst. The combination of bacteria in the root canal and cemental damage on the external root surface following avulsion injury resulted in external inflammatory root resorption, which was in the form of multiple moth eaten appearance in the conventional radiographic and tomographic images.

The splinting of teeth together with composite resin enhanced the stability of teeth and eliminated the chances of teeth being displaced or extruded during surgical procedure. Although, splinting during surgical management of resorption is not in routine practice, it was considered to be mandatory in the present case having excessive bone loss and mobility. Splinting seems to be a promising option while performing the surgery so as to achieve a predictable treatment outcome.

The restoration of choice for resorptive lesions should reinforce the tooth structure, possess a coefficient of thermal expansion close to that of the tooth structure, and promote good biological response. The light-cured RMGIC has been used in the present case to restore the
accessible resorptive lesions to have a control on the setting reaction with a short setting time. It has favorable physical properties similar to those of resin cements while retaining the basic features of the conventional glass ionomer cement.\(^5\) It has been clearly shown that RMGIC is biologically acceptable in an in vivo environment.\(^6\) Few inaccessible resorptive lesions were left without restoration as TCA was used to cauterize the residual resorptive tissue.\(^7\)

Although we recommend reverse sandwich restoration (RSR) to be the better technique to restore the resorptive defects,\(^2\) the same technique was not advocated in the present case. The defects were not deep that demands root reinforcement with RSR. Alternatively, MTA also could be used; MTA is not affected in the presence of moisture. The development of subgingival plaque could be promoted as a result of the rough surface of MTA. Because MTA is not a hard material, it could not reinforce the tooth structure and be partially scraped off during mechanical cleaning of the root surface.\(^8\) Hence, RMGIC was used instead of MTA. Although the incorporation of 2-hydroxyethyl methacrylate to the formulation of conventional GIC resulted in enhanced flexural strength and elastic modulus, the biocompatibility of RMGIC is compromised in vitro.\(^9\) On the contrary, it has been clearly shown that RMGIC is biologically acceptable in an in vivo environment because of local removal of 2-hydroxyethyl methacrylate via lymphatic drainage over time.\(^10\) Moreover, the concentration of inorganic ions, namely Sr\(^{2+}\), Al\(^{3+}\), and F\(^-\), released from RMGIC are too low to be cytotoxic.\(^9\) Accordingly, the RMGIC was well tolerated by periodontal tissues in our case. The present case is still under observation to monitor the longevity of the tooth.

**Conclusion**

The tooth with poor prognosis was salvaged by the removal of granulomatous tissues and the repair of the resorptive defects with RMGIC. The use of CBCT in this case had proved to be the best diagnostic imaging modality for EIR. Further long term clinical follow-up are required to provide more information about the longevity of the tooth.

**Ethical Clearance**- Taken from the Institutional Ethical committee

**Source of Funding**- Self

**Conflict of Interest** - Nil

**References**


Utilization of Health Care: Factors Affecting Utilization of Health Care in Rural Areas of Jorhat District of Assam

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PhD. Research scholar, Omeo Kumar Das Institute of Social Change and Development, VIP Rd. Upper Hengrabari, Guwahati, Assam

Abstract
To examine the use of health service for treatment in rural areas of Jorhat district, a cross sectional household survey was conducted with a sample of 242. As the population increases with the limited resources government alone cannot cater the health of whole population. Private health sector is equally important for the improvement of health of the people. In view of this present study was planned to examine the utilization of health care facility. This study was done particularly in rural areas, so private facilities were not available nearer to them. Most of the respondents were belong to lower income group, as they cannot afford the huge medical expenses of private hospitals. A binary logit model has been used to determine the factors influence the utilisation of public health facility.

Keywords: Utilisation, public health facility, Socio-economic factors

Introduction
Good utilization of health service serves to improve the health status of the population.1 There are various studies which have shown that only physical existence of the health service is only enough to guarantee their use as other socio-economic factors could influence their access and thus utilization.

India is a developing country with a growth of Gross Domestic Product (GDP) during 2018-19 is estimated at 7.2 per cent as compared to the growth rate of 6.7 per cent in 2017-18. Growth of any country directly reflects the wellbeing of its population which is related to good health. Health has been declared a fundamental right in many countries. National governments all over the world are striving to expand and improve their health care services. Health care for prevention and promotion of health is one of the basic human rights, as declared in the Universal Declaration of Human Rights (Article 25). With the economic growth, population also increased rapidly and 25% of rural and 14% urban population still living below poverty line. With the limited resource government alone cannot serve the whole population. To meet the demand and supply private health sector is equally important for the improvement of health status of the people. Private services expand rapidly in urban areas but with a limited extent in rural areas.

Access to health service is considered as a link between the health system and population it served. The type of the service provided, whether it is reachable or not, people perception about the service, acceptability of the service provided, all influence the access and utilization of service.2 In some the studies poor education about when to seek care, poverty, perceived high cost of services; inadequacy of available services such as lack of drugs, basic laboratory services, inadequate number of healthcare workers, poor quality of care and proximity to the facility were identified as perceived factors barriers to utilization of health facility. Increasing the utilization of health service is one of the important objectives of the government because it has direct impact on burden of disease. Assam government took various family welfare schemes to increase the utilization of health service to improve health status. The present study tries to analyse the utilization of health care and factors affecting this.

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E-mail: Sampurnakhound123@gmail.com
Objective: The present study was planned with the following objectives:

- To assess the utilization of health service.
- To assess the relationship of various socio-economic and demographic factors affecting utilization of health service.

Materials and Method

Study design: Both primary and secondary sources of information used in the study. The study was cross sectional for a period of three month. Sample was drawn from the rural population of Jorhat district. Secondary information has been collected from different sources like the Directorate of Economics and Statistics, Directorate of Public Health, Planning Board, District Medical Offices, Journals, Books etc.

Sample Size: The sample has been selected using a multi stage design. Two development blocks of the district have been selected for field study mainly on the basis of highest proportion of rural population. Sample blocks are Jorhat block and Titabor block. From the two development blocks, 2 gaon panchayat (G.P) have been selected purposively. From the two gaon panchayat 25 percent of village has been selected on the basis of highest proportion of rural population. Four villages have been selected from the two G.P. Finally, 10% households has been selected from each of the villages are randomly. The total sample size of the study is 242 households.

Analytical tool: Tabulation was done to present the collected information in systematic way. Bar diagram, pie charts were used where needed. Statistical methods are like percentage, averages were also used. A logit model has been used to examine the factors influencing the utilisation of health service.

Result and Discussion

India is a signatory to the Alma Ata declaration, which aims at achieving ‘Health for all’ by the year 2000 AD’. Government gave much effort to achieve this. The present study tries to analyse the utilization of health service among the rural population. By reviewing various studies it has been found that utilization is affected by various socio-economic factors. In a study by Shukla et al, in the rural areas of Lucknow found that utilization of health service is affected by socio-economic factors like caste, occupation and cost of the service they received.9

In the study area disease prevalence rate has been tried to find out. Prevalence rate refers to the proportion of people in a population who have a particular disease at a specific point of time or over a specific period of time, regardless of when that illness or condition began, per 1000 population.

Prevalence rate=

The numerator includes not only new cases but also old cases (i.e. people who remained ill during the specific point or period of time) and the denominator includes the total population. The disease prevalence rate was found 262.89.

The respondents who have visited public or private health care facility are included in the present study. Out of the total households 242, 164 were visited to public health facility, 55 were visited to private and 23 to others.
visited to public health facility. People engaged in above mentioned occupation indicates a poor paying capacity of people. In this study cost of health service provider came out as a main reason for choice of provider. Free service at the public health facility and nearer to households attracted people to public service provider. Selection of health service provider also depends on type of disease people suffered from. The sample households reported that the complex cases which cannot get cured in rural health institutions are referred to a higher facility as most of the PHC and CHC are not in a position to deliver the specialized health care service.

Table: 1- Distribution of morbid persons seeking treats by type of health institutions

<table>
<thead>
<tr>
<th>Type of institutions</th>
<th>No. of households</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHC/CHC</td>
<td>38</td>
<td>13.38</td>
</tr>
<tr>
<td>District hospital</td>
<td>136</td>
<td>47.89</td>
</tr>
<tr>
<td>Private hospital</td>
<td>42</td>
<td>14.78</td>
</tr>
<tr>
<td>Private clinic</td>
<td>68</td>
<td>23.94</td>
</tr>
<tr>
<td>Total</td>
<td>284</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field survey

It appears from the table 1 that 47.89 percent of households seek treatment from district hospital. Likewise 13.38 percent of household visited for treatment in PHC and CHC particularly belong to Bekajan development block as it was located at a far distance from Jorhat town. However, treatment sought from private hospital relatively lowers (14.79). 23.94 percent of households visit to private clinic for treatment.

Maternal and child health care given much importance for improving the quality of human resource and there are various welfare schemes have launched by state government emphasizing on preventive and educational aspects of maternal health care so that institutional delivery can be increased. In Jorhat district it seems to have been working good and almost all the mothers during the last 5 years in the survey area reported that their delivery took place in health institutions. Among them 84.91 percent of pregnant lady consult doctor before delivery but 15.09 percent did not consult any doctor and they reported reason behind this as economic constrain and some of them were not aware of this. It was also reported that ASHA workers doing their jobs sincere which helped in increased the institutional delivery.

Table: 2- Place of delivery among different socio-economic group (in percentage)

<table>
<thead>
<tr>
<th>Selected variable</th>
<th>Description</th>
<th>Public</th>
<th>Private</th>
<th>Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caste</td>
<td>General</td>
<td>66.67</td>
<td>33.33</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OBC</td>
<td>55.31</td>
<td>44.68</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>78.85</td>
<td>18.65</td>
<td>2.50</td>
</tr>
<tr>
<td></td>
<td>ST</td>
<td>85.60</td>
<td>5.84</td>
<td>8.56</td>
</tr>
<tr>
<td>MPCE (Monthly per capita consumption Expenditure)</td>
<td>500 and bellow</td>
<td>89.50</td>
<td>-</td>
<td>10.50</td>
</tr>
<tr>
<td></td>
<td>501-1500</td>
<td>82.14</td>
<td>17.86</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1501-2500</td>
<td>52.17</td>
<td>47.83</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2501-3500</td>
<td>40</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>3501 and above</td>
<td>25</td>
<td>75</td>
<td>-</td>
</tr>
<tr>
<td>Occupation</td>
<td>Government service</td>
<td>89.11</td>
<td>10.89</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Private Service</td>
<td>58.14</td>
<td>41.86</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Business</td>
<td>71.22</td>
<td>28.78</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Agriculture</td>
<td>88.17</td>
<td>10.50</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>Daily wage Earner</td>
<td>88.04</td>
<td>2.30</td>
<td>9.66</td>
</tr>
</tbody>
</table>

Source: Field Survey
With regard to the selection of place of delivery among different caste group showed that most of the backward caste (SC/ST) people choose public institutions for delivery. In various income groups as monthly per capita consumption expenditure increases people preference for private institutions increased. 10.50 per cent delivery took place at home whose monthly per capita consumption expenditure is 500 and bellow. Agriculturist and daily wage earner preferred public health facility and they reported main reason behind this was low cost. A study done by Patrick found that main reasons for visiting public health facility are closeness, affordability and availability of facility.

Immunization is the process by which a child is made immune by vaccine. Vaccine stimulates the baby’s own immune system to protect the person against subsequent infection or disease. In the surveyed area it has been reported that most of the children getting vaccine in government institutions like SC, PHC, CHC and government hospital. It has been found that out of total children who received complete vaccine. 55.85 percent vaccinate their child at sub-centre. Total 89.19 percent receive vaccine from government hospital, on the other hand only 10.81 percent received from private institutions.

A logistic regression model has been used to examine the factors influence the utilization of public health service. The binomial logistic model applied here can be written as

$$ PHS_i = \ln\left( \frac{1}{1-P_i} \right) = \beta_0 + \beta_1 C_i + \beta_2 F_i + \beta_3 E_i + \beta_4 O_i + \beta_5 M_i + \beta_6 D_i + \beta_7 C_0 + U_i $$

Where, $P_i$ is the predicted probability of accessibility of primary health care which is coded as 1 and 1-$P_i$ is the predicted probability that does not use primary health care which is coded as 0. $B_j$ represents the constant term includes in the model. $\beta_1, \beta_2, \ldots$ are regression coefficient for each of the explanatory variables, $U_i$ is the stochastic error term.

### Table: 3-Description of the explanatory variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Definition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td></td>
<td>Factors determining utilization of public health care</td>
<td>1 if yes, 0 if otherwise</td>
</tr>
<tr>
<td>Utilization of Public Health Service $PHS_i$</td>
<td>Categorical</td>
<td>Caste of the sample households</td>
<td>1 if general, 0 if otherwise</td>
</tr>
<tr>
<td>Independent variable</td>
<td></td>
<td>Total family member of the households</td>
<td>1 if nuclear, 0 if joint</td>
</tr>
<tr>
<td>Caste ($C_i$)</td>
<td>Categorical</td>
<td>Caste of the sample households</td>
<td></td>
</tr>
<tr>
<td>Type of family ($F_i$)</td>
<td>Categorical</td>
<td>Education of the respondent</td>
<td></td>
</tr>
<tr>
<td>Education ($E_i$)</td>
<td>Categorical</td>
<td>Occupation of the respondent</td>
<td>1 if service, 0 if otherwise</td>
</tr>
<tr>
<td>Occupation ($O_i$)</td>
<td>Categorical</td>
<td>Distance between the place of residence and PHC</td>
<td>1 if up to 8 k.m., 0 if above 8 k.m.</td>
</tr>
<tr>
<td>Distance ($D_i$)</td>
<td>Categorical</td>
<td>Communication facility between the place of residence and PHC</td>
<td>1 if own vehicle, 0 if otherwise</td>
</tr>
<tr>
<td>Communication ($C_0$)</td>
<td>Categorical</td>
<td>Factors determining utilization of public health care</td>
<td></td>
</tr>
<tr>
<td>MPCE ($M_i$)</td>
<td>In Rs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the following table 4 the results of the estimated logistic regression model present.
Table: 4- Factors Affecting Utilisation of Public Health Service Dependent Variable- Utilization of Public Health Service (PHS)

<table>
<thead>
<tr>
<th>Regressor</th>
<th>B</th>
<th>Wald</th>
<th>Exp. B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caste (C_i)</td>
<td>-.157</td>
<td>.038</td>
<td>.855</td>
</tr>
<tr>
<td>Type of family(F_i)</td>
<td>-.714</td>
<td>.965</td>
<td>.489</td>
</tr>
<tr>
<td>Education(E_i)</td>
<td>-1.754</td>
<td>3.895**</td>
<td>5.780</td>
</tr>
<tr>
<td>Occupation(O_i)</td>
<td>-.091</td>
<td>.011</td>
<td>1.095</td>
</tr>
<tr>
<td>Distance(D_i)</td>
<td>-1.622</td>
<td>4.269**</td>
<td>.197</td>
</tr>
<tr>
<td>Communication(Co_i)</td>
<td>2.877</td>
<td>1.894</td>
<td>17.768</td>
</tr>
<tr>
<td>MPCE(M_i)</td>
<td>-31.557</td>
<td>20.986***</td>
<td>0.000</td>
</tr>
<tr>
<td>Constant</td>
<td>97.023</td>
<td>20.317</td>
<td>1.369E42</td>
</tr>
</tbody>
</table>

Cox & Snell $R^2 = .638$
Nagelkerke $R^2 = .896$
Hosmer and Lemeshow Goodness of fit test statistic $= .993$
*** implies 1% level of significant
** implies 5% level of significant

Estimated result of the logistic regression model shows that out of the 7 influencing variables included in the model, only 3 variables such as education, distance and MPCE are found to be significant factors determining the Utilisation of health care facility. Caste, type of family, occupation and communication facility is not found to be significant. Nagelkerke test and Hosmer and Lemeshow goodness of fit test shows that model is good fitted.

It is found, an increase in the education of the respondent decrease the use of public health care facility by 1.754 units. So far as relationship between distance from the place of residence and utilization of public health care facility is found to significant. The β coefficient for distance is being -1.622. The negative sign indicates that if the distance between place of residence and public health care increases the likelihood of use of public health care facility decrease.

Another factor which is found to be highly significant is the monthly per capita consumption expenditure (MPCE). It is also found to be negatively significant with the dependent variable. It is found that if MPCE increase use of public health care facility decrease by -31.557 units. This shows that if their consumption expenditure increases their ability to purchase health care improved so they switch from public to private facility.

Respondents were asked how much they satisfied from the services provide through Public health facility. The following table shows their response.

Table: 5- Response by the sample households on service of public health service

<table>
<thead>
<tr>
<th>Service</th>
<th>Good</th>
<th>Poor</th>
<th>Very poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services of nursing staff</td>
<td>154 (63.64)</td>
<td>82 (33.88)</td>
<td>6 (2.47)</td>
</tr>
<tr>
<td>Medical check-up by doctor</td>
<td>145 (59.92)</td>
<td>73 (30.17)</td>
<td>24 (9.92)</td>
</tr>
<tr>
<td>Services of support staff</td>
<td>143 (59.09)</td>
<td>91 (37.61)</td>
<td>8 (3.31)</td>
</tr>
<tr>
<td>Waiting room</td>
<td>132 (54.55)</td>
<td>95 (39.26)</td>
<td>15 (6.19)</td>
</tr>
<tr>
<td>Examination room</td>
<td>109 (45.04)</td>
<td>108 (44.63)</td>
<td>25 (10.33)</td>
</tr>
<tr>
<td>Equipment</td>
<td>90 (37.19)</td>
<td>133 (54.96)</td>
<td>19 (7.85)</td>
</tr>
<tr>
<td>Availability of medicine</td>
<td>70 (28.93)</td>
<td>114 (47.12)</td>
<td>58 (23.97)</td>
</tr>
<tr>
<td>Operation theatre</td>
<td>60 (24.79)</td>
<td>125 (51.65)</td>
<td>57 (23.55)</td>
</tr>
<tr>
<td>Provision of ambulance facility</td>
<td>50 (20.66)</td>
<td>118 (48.76)</td>
<td>74 (30.57)</td>
</tr>
<tr>
<td>Availability of testing laboratory</td>
<td>40 (16.53)</td>
<td>112 (46.28)</td>
<td>90 (37.19)</td>
</tr>
</tbody>
</table>

Source: Field survey
Values within parenthesis are row percentage.

From the table 5 it is observed that a mixed response got from the respondents. Most of the respondent reported waiting room facility, availability of medicine, provision of operation theatre, ambulance facility and testing laboratory in primary health centers as poor.

**Conclusion**

In this study we found that socio-economic factors have an influence on the use of health care facility. Education, distance between the place of residence and health care facility and also monthly per capita consumption expenditure are found to be important determinant of utilization of public health care facility. In the study it is also revealed that low cost of the health service and availability of the facility as the main reasons for use of public health care. Opinion on the public health facility shows that respondents are not satisfied with the availability of medicine, testing laboratory, ambulance facility, operation theatre etc. in the hospitals. It needs an effective and continuous strategy to improve the public health care facility. Monitoring and supervision of the services in the government health centres is essential for improving the quality of care. The process of current evaluation should be strengthened to monitor the performance of the public health facility.

**Ethical Clearance:** There is no objection while collecting data.

**Source of Funding:** Self.

**Conflict of Interest:** No.

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Effect of Therapeutic Laser in the Management of Diabetic Foot Ulcer

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Abstract

Introduction: Diabetic foot ulcer (DFU) is one of the common complications of diabetes mellitus (DM), which leads to lower limb amputation. The most frequent underlying etiologies are neuropathy, trauma, deformity, high plantar pressures and peripheral arterial disease. Loss of protective sensation is the primary factor in foot ulceration in diabetics.

Methods and methodology: 30 male and female patients were selected based on the inclusion criteria (according to wagner grading system). They were divided into two groups randomly and named group A as control group and group B as experimental group. Group A received conventional therapy where as group B has received therapeutic laser (TL) Helium – Neon (He – Ne) of 660nm wavelength with a dosage of 4J/cm² for five days a week for four weeks. Their pre and post intervention values were taken and analyzed by using T test.

Results: Both the groups were compared with pre intervention and post intervention scores by using T test. Group A results were not significant where as group B results showed significant values at p <05.

Keywords: Diabetic foot ulcer (DFU), Diabetes mellitus (DM), Therapeutic laser (TL), Helium Neon laser (He – Ne)

Introduction

Diabetes mellitus (DM) is one of the common problem in humans worldwide. In recent times India has more number of diabetics. According to International diabetes foundation and World health organization India is called as capital of diabetes1. Currently it affects more than 62 million Indians. It is more than 7.1 adult populations. The average age of onset is 42.5 years2. According to Indian Heart Association it is estimated that by 2035 there would be 109 million individuals with diabetes3. Indian Council for Medical Research (ICMR) conducted a large community study and revealed that lower proportion of population is affected in the states of North India (Chandigarh 0.12 million, Jharkhand 0.96 million) when compared with Maharashtra (9.2 million), Tamil Nadu (4.8 million)4 and 12% of Telangana population5.

During the course of the disease, 50% of patients eventually develop the complications6. Off these complications diabetic foot ulcer (DFU) are one the significant complication which leads to lower limb amputation. The most frequent underlying etiologies are neuropathy, trauma, deformity, high plantar pressures and peripheral arterial disease. Loss of protective sensation is the primary factor in foot ulceration in diabetics7.

The uncontrolled diabetic individuals, results from skin break and exposure of underneath structures and common under the great toe, ball of the feet and on the dorsum aspect of the foot. The causes for ulcer formation are decreased blood supply which causes vascular disease and leads to delay in ulcer healing, due to elevated blood sugar levels the healing process will be delayed and increase in infection rate, nerve damage will cause tingling sensation or no sensation which converts wounds into ulcers. Skin dryness is a common factor which results in cracking, calluses, corns and bleeding.
wounds. If the foot ulcer is not treated at the earliest it may lead to foot amputation. Many treatments like wound cleaning, debridement, skin grafting, antibiotics, vasodilators, pain management, different types of bandages and therapeutic treatments like ultrasound, infrared rays and ultraviolet rays, thermotherapy and exercises were tried to treat the foot ulcers, but the results are unsatisfactory.

**Therapeutic lasers:** These are also called as cold laser which produce a maximal output less than 1mW and produces a photo chemical rather than thermal effects. Laser lights depth of penetration depends on the type of laser energy delivered. Absorption of helium – neon (He-Ne) occurs rapidly in superficial tissues especially in the first 2 – 5 mm. The response that occurs is called as direct effect where as there will be 8 – 10mm of indirect effect.

**Wagner classification system:** Wagner ulcer classification system is the most widely accepted classification system for diabetic foot ulcers and lesions. It is based on the depth of penetration, presence of osteomyelitis or gangrene, and the extent of tissue necrosis. Wagner classification system is most widely used to describe the natural history of the devascular foot. This system assesses ulcer depth and the presence of osteomyelitis or gangrene by using the following grades: grade 0 (pre- or post ulcerative lesion), grade 1 (partial/full thickness ulcer), grade 2 (probing to tendon or capsule), grade 3 (deep with osteitis), grade 4 (partial foot gangrene), and grade 5 (whole foot gangrene).

**Materials and Methodology:**

Total 30 male and female patients suffering with DFU were selected into the study from Vaagdevi physiotherapy rehabilitation centre and MGM hospital. The duration of the study lasted for four weeks. Patients who had DFU were included into the study. Patients suffering with other types of wounds, neurological disorders, orthopedic and cardiac complications were excluded from the study.

Both males and females suffering with DFU were selected for the study from Vaagdevi Physiotherapy and Paediatric rehabilitation centre and MGM hospital. These 30 patients were divided randomly into two groups according to simple randomization by using hat method. Group A has 15 patients and group B has 15 patients. Group A patients are named as control group and received conventional treatment like antibiotics, adhesive backing film and silicone coated foam. Whereas Group B patients are named as experimental group and were positioned comfortably and treated with Therapeutic laser (Helium – neon) with a wavelength of 660 nm with a dosage of 4J/cm² for five days a week for four weeks along with antibiotics. Patients were stratified and their pre and post intervention status of wound was recorded according to Wagner grading system.

**Results**

Post intervention scores for both the groups were calculated. Their mean and standard deviation was calculated. Both the groups were compared with pre intervention and post intervention scores by using T test. Group A results were not significant where as group B results showed significant values at p <05.

| Table 1: Mean and standard deviation values |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 | GROUP A         |                 | GROUP B         |                 |
|                 | Pre             | Post            | Pre             | Post            |
| Mean            | 2.46            | 2.33            | 2.53            | 1.66            |
| S.D             | 0.743           | 0.723           | 0.639           | 0.617           |

| Table 2: Group A and B t and p values |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Groups          | t-value         | p-value         |
| Group A         | 1.467           | .16432          |
| Group B         | 5.245           | .00012          |

**Discussion**

DFU causes a major healthcare problem with significant cause of morbidity and mortality. It causes financial burden to the diabetics. In patients with DFU healing process is arrested at inflammatory stage, and its further progression is not clearly known. Several biological processes at cellular and molecular levels are involved in wound healing. Moist wound therapy is known to promote fibroblast and keratinocyte proliferation and migration, collagen synthesis, earlyangiogenesis and wound contraction. At present, there are various categories of moist dressings available such as adhesive backing film, silicone coated foam, hydrogels, hydrocolloids etc. Unfortunately, all moist dressings cause fluid retention; most of them require secondary
dressing and hence are not the best choice for exudative wounds\textsuperscript{13}. Therapeutic laser properties of healing are likely to be photobiomodulation which results in increased production of granulation, proliferation of fibroblast, collagen synthesis, neovascularization, and early epithelialization. Therapeutic laser is gaining lot of interest when compared with other non-invasive treatment modalities\textsuperscript{14-22}.

Low-level laser radiation was found to have a stimulating effect on cells, and high-energy radiation had an inhibiting effect. The application of lasers to stimulate wound healing in cases of non healing ulcers has been recommended\textsuperscript{23}. Therapeutic laser stimulates the release of cytokines and growth factors into the circulation. These are responsible for vasodilatation of the vessels and formation of new capillaries. Ulcer bed with edge was irradiated locally with TL (660nm), about 4-J/cm\textsuperscript{2} for 10 minutes five days a week for four weeks. After four weeks of intervention, the experimental group showed a significant reduction in the ulcer size.

Schindl A et al., has conducted a case study on diabetic neuropathic foot ulcer. They applied Low intensity laser therapy with a wavelength of 670 nm diode laser. They have administered laser for duration of four weeks with four sessions per week. They found that the ulcer has been completely healed, even after a follow-up of nine months, there was no recurrence of foot ulcer\textsuperscript{24}.

**Conclusion**

This study concludes that therapeutic laser has shown encouraging results in the management of diabetic foot ulcers. Further investigations and intervention with various laser dosages are necessary for better results.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** IHEC/VCOP/VCOPH/2016/1/1 dated 04/01/2016

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Abstract

Talent acquisition is a long-term strategy to make hiring process more effective and efficient. It is an important task in every organization to succeed their operations in the competitive environment. Cloud based technology is the emerging practice which solves many problems in real time works especially human resource management. Many health industry experts and human resource managers trust the cloud technology that it can develop the services and research of health care and assist to find the talent candidate. The main objectives of the study are a) to study the invasion of cloud technology and its benefits in talent acquisition and b) to analyze the recent technological changes as well as to identify and overcome the challenges in the health industry in talent acquisitions process. Secondary data was collected from web sources and journals. Interviews with human resource managers of health sectors and cloud vendors were conducted during December 2018 to identify their opinions towards use of cloud in talent acquisition.

Keywords: acquisition, cloud, health care industry, human resource, recruitment, talent, technology

Introduction

The processes of recruitment and talent acquisition are the critical tasks in every organization to succeed their operations effectively and efficiently. In the battle of hiring talent candidates, the worldwide talent acquisition, technology in staffing and services market is undergoing a transformation to cloud technology. In cloud model, data are stored in the remote server in the internet rather than the server placed inside the organization (local server), so that it can be easily accessed from any place at any time by authorized personnel of an organization. Agarwal described that the cloud is renovating nearly all types of industries in the market especially service sector such as health, education, banking, recruitment etc. He also pointed out the PwC’s worldwide survey report that the sector’s use of cloud computing increased up to 73 per cent in 2017 from 68 per cent in 2016 in which human resource industry benefitting most. Currently many health industries are investing more amount in cloud technologies and adopting the engine of SMAC (Social media, Mobile technology, Analytics, and Cloud model) driven HR to get maximum benefits on investments in marketing. Cloud technology supports healthcare applications like EMRs, HIS, PACS, and others affordable and easily accessible.

Statement of the Problem

Bagai described in his recent study that small scale sectors are not having the adequate resources to trace talent individuals for their short term projects, just in time assignments, over-time works, and seasonal jobs. They are facing difficulties to find good candidates among the availability of more resumes received in the organization. Nowadays all online activities and communications are linked with cloud computing. A research report of Peoplescout.com said that 46 per cent of hiring managers felt difficulty in filling full-time employees for skilled medical positions and it also predicted that around 2.3 million jobs in the healthcare sector to be
filled by 2026, 0.7 million nurse jobs to be filled by 2024 and 1.04 million potential physician vacancies by 2030. The Bureau of Labor projects statistics estimated that healthcare occupation in United States economy will grow 18 per cent from 2016 to 2026 and scope for 2.3 million jobs in the same industry. Growing healthcare sector face new challenges in retaining top talent and also need to secure talent. Technology advancements in talent acquisition evolving candidate expectations in health industry and the need for more advanced workforce planning put force on recruiters to keep pace with new demands. It is important to analyze the impact and the challenges faced by the recruiters while implementing cloud technology in health industries. The study aims to explore the benefits of cloud for talent acquisition and its importance in health industry.

Review of Literature

Recruitment is a major activity of human resource department in an organization to fulfill the immediate vacancies while talent acquisition is a strategy for long-term to hire talent individual more productive and efficient. The process of talent acquisition will take more time and at last it will facilitate to build a good team in an organization. Some of the specific product markets (niche) create demand for talent acquisition strategies contain financial management, technology, law and medicine. Now-a-days, promoting company culture on social medias like facebook ads, you tube ads, LinkedIn, Twitter etc. can be a great utility for building employment brand and obtain talent individuals for the skilled job positions.

White described the application of cloud model in recruitment and onboarding of new personnel in an organization such as finding the right candidate, accessing the data at anytime from anywhere, sharing data quickly, security etc. The cloud technologies help to recruiters to reduce recruiting time for technical and highly skilled positions, while increasing the quality and multiple skill sources of applicants. Due to discrepancies in existing Applicant Tracking Systems (ATS), hiring companies miss out on more than 50 per cent qualified candidates and technology enterprises improperly classify up to 80 per cent of candidates. A recent analysis conducted by the Staffing Industry in 2018 said that the organizations are spending 82 billion US dollar on a global level for storing and managing the data in human cloud. Johnson and Diman highlighted in their study that the maximum numbers of small and medium sized companies are using cloud-based Human Resource Information System (HRIS) for daily human resource operations, supporting from top management as well as vendors. Little revealed that the recent adoption of cloud computing and its models like Platform as an Service (PaaS), Software as a Service (SaaS) and so on are influencing the relationships with learning management systems and learning content management systems. There is a huge demand for customer and vendor investment in the talent acquisition market because of availability of new functions. In order to face new challenges and improve internal recruiting programs, processes and capabilities, many healthcare sectors are approaching to a Recruitment Process Outsourcing (RPO) partner to hire top talent employees in the job market. Most of the above researches in this paper revealed that the necessity of cloud recruitment and usage of cloud models in talent acquisition in the current scenario.

Objectives of the Study

The main objectives of this study are:

i. To study the invasion of cloud technology and its benefits in talent acquisition.

ii. To analyse the recent technological changes in the health industry in the process of talent acquisition.

iii. To identify and overcome the challenges in cloud based talent acquisition in health industry.

Research Methodology

In order to achieve the objectives of the study, secondary data was collected from web sources and journals to identify the recent trends, benefits and opportunities in usage of cloud model in health sector’s recruitment process. Interviews with HR managers of health sectors and cloud vendors were conducted during December 2018 to identify their opinions towards employment of cloud in talent acquisition. This study is basically done as an exploratory research.

Application of cloud model in talent acquisition

Cloud provides various service models and each model performs different functions for fulfilling the needs of different people. The most important models of cloud technology are supporting to improve the services in recruitment and talent acquisition. As
a customer, you pay for what you use. IaaS is a type of a service model of cloud which provides computing resources virtually in the internet and offer large storage for all medical facilities. In PaaS model gives the ability to the customer to deploy customer created apps using programming languages, tools etc. SaaS model provides leases applications or softwares which are owned by them to its client. Apart from this, HRaaS provides human resource service under cloud model. There are three types of deployment models in cloud technology such as private, public and hybrid model. In Private cloud model, services are offered to a minimum number of people in addition with a security tool firewall and companies are allowed to take control over their data. Public cloud is a service provider that provides resources such as software applications and storage and which are accessible to general public over the internet. In some cases, organizations can use Hybrid model, a mix of private cloud for on-premises and public cloud for third party services. Currently, cloud service providers such as Google cloud platform, Digital ocean, IBM cloud, Amazon web services, terremark worldwide and Microsoft Azure are the major vendors in the world.

Reasons for adopting cloud-based recruitment and talent acquisition

The following are the reasons why the organization should adopt cloud-based recruitment technology to meet talent acquisition.

a) Integrated approach to candidate management: SaaS model provides an integrated approach to applicant management and tracking system. A unified software system offers various functions such as analysis of applicants experience, acquisition, on-boarding, supplying and progression.

b) Innovative assessment and filtering techniques: A cloud-based Recruitment Management System (RMS) will permit the employers and HR managers to easily find the skilled employees at affordable cost, assess and categorize the top candidates. It will help to make 360° view innovative assessment and filtering techniques of top applicants.

c) Effective interaction between hiring managers and recruitment teams: Bersin[1] reported that the cloud based effective software solution improves the collaboration between the hiring managers and recruitment team. This will impact to take smart decisions, increase the value and improves the productivity of the concern.

d) Large-scale data analytics: The talent-centric recruitment organization will emphasis on detailed analysis of candidates through predictive analysis and Big data technology. The cloud model helps the hiring managers to access all important private data on mobile devices at required time.

e) Mobile optimization and social integration: A report by PWC[12] said that 73 per cent of CEOs citing skills shortages at crisis levels. Absence of mobile optimization technological issues can be sorted out by embedding Candidate Relationship Management system software, adoption of social media tools and the cloud based proactive tool for social interaction.

f) Chatbots for candidate engagement: In order to facilitate effective candidates engagement, hiring organizations are using chatbots and data mining algorithms to filter the resume of skilled candidates, identifying best prospects and screening process.

g) Choosing the right candidate: It helps to choose right candidates with required skills from large volume of data in the very short period.

h) 24/7 service: Hiring managers can work with cloud based recruitment software and access the data 24/7 at any place whether on vacation, in medical leave, business meetings/trips, or even at home.

i) Rapid data sharing and Better Security: The data stored in the cloud server can be shared widely within the company with secured tools.

j) Speeds up the Recruitment Process, Cost reduction and easy implementation: It helps companies save on installation costs, customize platform to meet specific needs and it takes very less time to implement.

Challenges and cloud based solutions for talent acquisition in health industry

The following are the general challenges faced by the HR team who works for talent acquisition while implementing the cloud technology for their operations. Meeting cloud expenses, working with multi-cloud model from different cloud service provider, transformation of existing process onto the cloud, lack
of understanding and knowledge about the cloud, difficult to convert backend process of HR Activities, lock-in a product affects transition to a peer product, cloud downtime and violation in data security are the common challenges faced by all types of industries. The major challenges faced by the health industries for talent acquisition process and the solutions for resolving them are described below.

i. Increasing turnover rates in health care industry is an important problem for HR managers. The demand for specialized healthcare positions, lack of internal resources, global expansion and mergers in healthcare sector also urge the need for scalable, cost-effective recruiting services and designing talent acquisition solution for their dynamic hiring needs. According to Compdata’s Benchmark Pro Survey conducted by Bares in 28,000 organisations in 2015 found that healthcare ranked second highest in turnover rates at 14.2 per cent compared to other industries. The fluctuation in hiring volume can be faced by RPO services by deploying more number of recruiters.

ii. Talent shortage is existing in all clinical, allied and non-clinical roles. An increase in number of hospital visits, long-term patients, and routine doctor appointments are creating the need for recruiting more vital allied and non-clinical staff. This issue can be addressed by AI enabled sourcing tools that can be used to discover patterns in candidates’ resumes, social profiles and screening the existing resumes in a healthcare organization’s applicant tracking system (ATS).

iii. Negative candidates experience will result in losing qualified candidates and posting of more number of poor reviews/comments on social medias and various job sites. Organisations should work for patient satisfaction, must understand the patients’ journey and feedback about a healthcare provider. In order to face this challenge, an optimized candidate experience such as automated interview, recruitment in mobile and social media, evolving talent communities, video interviews, digital assessments, bespoke job descriptions, customized career websites, balancing of human interaction and partnering with RPO can be implemented to deliver a highly personalized application experience.

iv. Online job advertisements and application submission, searching job and application in smartphone, AI & ML, big data, predictive analytics, increasing usages of different social medias, video and chatbots interviews, digital assessments and automated emails are optimizing the recruiting functions and increasing the customer expectations. RPO partners are utilizing machine learning technologies for developing algorithms for good hiring process from existing candidate data in the healthcare organizations.

Apart from these, there are some common recommendations to overcome the challenges in talent acquisition process. They are a) seeking assistance from various technological solutions for cloud cost management, b) making relationship with cloud computing partner, c) a centralized cloud team for cost and budget preparation, d) maintaining a proper infrastructure, e) trained HR personnel in cloud, f) proper designing of security frameworks, g) backup solutions and disaster recovery, h) protective efforts during downtime and i) improving corporate culture that guarantees data security.

**Conclusion**

There is need to modernize the health industry with advanced IT infrastructure for enabling faster, safer and efficient health care delivery. While implementing this cloud technology in health care sector, organisations should give assurance for patient privacy and sensitive personal information. Separate cloud model for healthcare is a most important need for addressing the security issues and fulfilling the various requirements in the health sectors. Currently, many developed countries like US are using cloud based information clearing houses for exchanging health information between hospitals, physicians and various health systems. Health organisations are practicing to store medical records and images in the cloud. Other side, a continuous cloud based research is conducted by the pharmaceutical industries for cheaper, additional effective treatment protocols and medicines. In order to implement the effective health care operations in rural/remote areas through mobile environment and a transformational shift from traditional healthcare to cloud health care, a separate healthcare cloud model is necessary for healthcare industry.
Ethical Clearance: This study was conducted using secondary data from web sources and journals to identify the recent trends, benefits and opportunities in usage of cloud model in health sector’s recruitment process. Interviews with HR managers of health sectors and cloud vendors in Bengaluru city were conducted during December 2018 to identify their opinions towards employment of cloud in talent acquisition.

Source of Funding: Self

Conflict of Interest: Nil

References


Contours of ‘Clinical Legal Education’

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Abstract

Law is central to society; governs everyday lives. It is one of the most rewarding, challenging and respected areas of study which develops intellectual and interpersonal abilities. Study of Law gives skills in abstract thinking, critical analysis and political problem solving aptitude. Basic aim of law education is to develop perception and jurisprudential understanding of the environment, local and global to know the cultural and social aspects of the time. Clinical legal education being one of the facets of entire Law curriculum provides for access to justice to the marginalized and disadvantaged sections of the society and to focus on promoting ethical responsibilities of the legal profession.

In India recent efforts to develop and expand serious clinical programs can serve as a positive example for the future expansion throughout the region. Prior to the establishment of formal and independent programme, legal training was tied directly to colonizing power. Now the clinical practice has become mandatory requirement for legal institution but still facing challenges. In view of making education globally competitive, there is need to adopt best practices and embrace new technologies for wider access to justice and to address community’s perceptions and experiences of issues.

Keywords: Law education, justice, social responsibility, rule of law, legal skills, global standards

Introduction

The contoursof ‘Clinical Legal Education’ can, well, be illustrated by a Jug Suraiyan(columnist for, Times of India, dialogue between ‘Lawyer’ in his chambers and ‘Client’ upon entry as below:

Lawyer : My dear, what obliges you to come here?

Client : Sir, I suffer from a number of thorns of life and so at your place for aid and advice.

Lawyer : Please deposit the fee for consultation and then tell me your ills.

Client : Sahib, I am poor and unable to pay you fee-it is so big. May I, still,

beg of your mercy and disclose my troubles?

Lawyer : (After viewing the client’s poor and pitiable condition) Well, you can.

Client : For sure, my woes veer round the past, present and future.

Lawyer : (With surprise) How!

Client :

1. Few years back, I would have some ill-gotten money, which I lent to an old friend of mine on rukka(pronote) and promise of soon return with modest interest. The said friend is now my foe and refuses to give back even my principal-nothing to say of interest. Upon making of demand(s), he threatens me and my family with dire consequences. And we live under a thatch, which hardly prevents sun or, rain.

These glaring events and many more in hide define our murky past.

My eldest daughter was entangled in a #Me too affair and is ashamed of initiating any criminal action. My second daughter was gang raped and local police has turned a deaf ear to our report. My third minor

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daughter was enamors of a boy in the vicinity and is insisting upon a matrimonial knot without delay. My only son was divorced twice—once on his own accord and next at the effort of his second spouse, who would complain of dowry-demand and domestic violence.

Now the question is and my worry…..

How to arrange and monetize the marriage(s) of daughters—it is the most worrisome problem:. How to maintain and preserve the muddy walls of the house and fleeting straws of the chhappar. How to earn the meagre crusts daily for feeding the large family—it is the last of many more torments.

Frankly speaking, these are the frosties of our future.

Lawyer: Enough and enough, stop your tale. I have diagnosed your malady—it is ‘Ignorance’, for which the ‘Remedy’ can be sought at the doors of a clinical expert of legal education.

In sooth, the lawyer’s retort contains a sound advice—legally as well as clinically vetted. To the like effect is the celebrated comment made, on the law of coercion, by the beadle, Mr. Bumble, in ‘Oliver Twist’ of Charles Dickens, which was quoted as beneath:

‘The law supposes that your wife acts under your direction. ‘If the law supposes that’, said Mr. Bumble, ‘the law is a ass—a idiot. If that’s the eye of the law, the law’s a bachelor, and the worst I wish the law is, that his eyes may be opened by experience—by experience’. Surely, the noun ‘experience’ must, by the spirit-rule of interpretation, signify the practical aspects of clinical education. Trite to say that India lives in villages so much so that the above dialogue, although imaginary, reveals the constant cankering of unawareness and lack of legal knowledge amongst the laymen.

Concept of legal clinics based on medical clinics

The concept of ‘Clinical Education ‘hails from its medical counterpart, whereby the medical students are so groomed, under the supervision of experienced doctors of a hospital, as to be able to assess the patient’s symptoms for the purpose of diagnosis and, then, prescribe treatment. In the context of legal education, it is a law college and institutes endowing the students with practical skills under the guidance of well-versed teachers from the ‘Faculty’ or ‘Bar’. Instructions in law, need, as such, be more aligned to clinical than theories. The old order of lectures in class-room, very often shooting overhead or passing through deaf ears, must change and give way to internship, so that the students may visit the proceedings, on the criminal, civil, revenue and writ side from beginning to the end. In a sense, clinical legal education aims at perfecting a democratic process of learning of how to plead, with grace and gratuity, for the woes of the downtrodden and marginalized sections of the society, too, to the ultimate fulfilment of objectives of social justice. In such a backdrop students are sure to gain (a) valuable legal skills, while delivering much needed legal services to the underprivileged communities, (b) shy traits of empathy and (c) keen insights into various burning issues.

There is need to understand the concept of welfare of society as a whole through these clinics. For certain, the goal of legal education is to pass on a number of concrete abilities to students i.e. to have concern for the lives of others, to grasp policies, to think about the good of the nation, and to recognize fellow-citizens with equal rights irrespective of caste, creed, religion, gender. Legal clinics offer the opportunity for students and faculty to engage with communities around them. Much of the conversation between student and client involves gathering facts and developing legal strategy dissensions, often more beyond that. Much trusted and personal relationship is born, which can mature and deepen over the course of time.

Clinical process and necessary skills

The object of the clinical component in the Law curriculum is to impart the necessary skills, attitudes and ethics among the law graduates who want to take career in the field of law and administration of justice. After independence, legal career was largely confined to litigation in courts and tribunals as well as civil and judicial services. With economic liberalization, opportunities for; legally trained people have opened up in a variety of jobs including corporate law firms doing transaction practice, in-house counsels in companies and industries, dispute settlement outside litigation including mediation, conciliation and arbitration, law reporting and publishing sectors and legal process outsourcing work. Under Rule of Law concept teaching and research have generated rigorous demand in major way where academicians, lawyers and legal professionals have to work with all required skills in expanded way. Through clinical processes of experimental learning,
students cultivate key skills to examine policies, law, regulations, local needs, traditions, circumstances and practices of that areas; to gain substantive exposure to principles of clinical legal education, international law on human rights and its implementation, theory of good governance, status of civil societies and scope of local and regional jurisdictions etc. and work towards the promotion of a democracy, that values and enhances the life-perspectives of all citizens of the nation.

As medical clinics provide instant relief and remedy likewise Legal clinics may be referred as to provide solution to clients in legal matters. Both these clinics are also referred as the part of teaching—learning while doing in association with respective field expert. These problems may relate to a business, compliance with laws and regulations, violation of rights or any of domestic grievances etc. Legal knowledge bearing on the problem can be learnt by reading laws and consulting earlier judicial decisions and precedents on the issues involved. And by applying this knowledge to problem, solutions may be found and skills may be developed to determine strategies, to assess the risks and to make decisions on the best way to proceed to get desired results and to some extent simulation exercises in college can help to practice skills.

**Local and Global Dimensions**

Clinical education as linked to social action and different local dimensions, in present scenario, increasingly getting global. Success of law schools and law students are connected with their association with society and community. With the growing time, this global mission has begun to develop clinical programs and helps to ease the path towards institutionalizing the clinical concept. The missionary zeal can, alone, pave the path for such a reach, so as to refine and streamline the professional techniques of budding lawyers by practical methods of experiential sort verging upon social needs of global dimension. In 1921, the Carnegie Foundation for the Advancement of Teaching, U.S. observed that legal education was lacking in clinical facilities as compared to engineering and medical education. It was suggested to develop legal aid to make justice more accessible and provide students real world experiences. In the result, major social issues saw the light of the day world-wide in the 1960s and 1970s as to poverty, consumer & civil rights and women-empowerment etc. and the clamors for institutionalizing the idea of practical training. Growth and acceptance of clinical programs around the world has supported new initiatives that reached across borders with no breaks, and no transcending regional and national barriers, which include Association of University of South Africa, Legal Aid Institutions in Nigeria, Polish Legal Clinics Foundation, Russian Clinical Legal Education Foundation and many others tapping, inter alia, to facilitate—the key elements of the programmes, that influence the clinical education around the world. Though Clinical Legal Education in India has grown significantly in quality and quantity but implementation is still not so smooth. Clinical programs face greater hurdles in securing the adequate faculty support for approving the program as a credited course. There are the constraints to discuss as mentioned here—

**Operational difficulties for clinical education in India**

Firstly, there is the problem of determining the source of expertise in the field of legal clinics. The lawyers, serious at the Bar, are more devoted to developing of their professional skills for money, rather than the zests for public services sans money. The students are, already, loaded with the heavy curriculum of compulsory subjects, optional subjects, core subjects etc., playing truancy, as well as hesitancy in class-rooms with a finger of scorn at outdoor/extraneous activities. The professors are, by and large, novices in the area, untrained for the errand and uninterested for the extra-curricular walkouts. The absence of bonus-expectancy, further, marginalizes them from the project. The vacuum is, thus, rampant and persistent for no chance of early fill-ups.

Secondly, the requisite number of clinicians is to be ascertained depending upon the area likely to be covered, population likely to be affected and litigation likely to be handled. Is n’t it so stupendous and deceptive a task!

Thirdly, the question is to ascertain the quality of such an expert. In case of matters covered by the dialogue, the expert, whether a practicing lawyer or a studying student, need be versed in the(a) laws of negotiable instruments, court fees, women’s rights, criminal and civil procedure, public interest litigation, legal aid, matrimonial and domestic causes,(b)non-statutory various government schemes of housing, education, healthcare, medicine and old age-cum-poverty pension and(c)earlier experiences of, and through, court visits. Where, and with whom, is
the stick of measurement and power of certification?

Fourthly, only he knows where, when and how to find the said unbranded God-father! In the Clients’ clinic! Let its location(s) be disclosed in a manner accessible to all, sundry and needy. The timings be notified and presence of the clinical helper(s) ensured. In the else, the expert(s) may visit village after village and represent justice at the doors.

Fifthly, the legal aids are hard and delayed to come and never sufficient to cover every nook and corner of the expenditure actually done at various stages of the adventure to the frequent passing of the buck to the litigant himself. Can, in such eventualities, the aim of free justice to the poor be actualized?

Sixthly, the clinical assistances are supposed to be gratuitous public services. Be as it may, but money, alone, makes the mare go. As such, the so-called experts feel inclined to work out their services only upon their palms being greased. The needy is to oblige the needful before the recognition of his/her litigious travails. The very purpose of legal mission is defeated.

Seventhly, the virus of corruption too is entering the portals in mysterious ways. According to Voltaire, even if God did not exist, we would have to invent Him. And we have, successfully, invented Him in the area of clinical philanthropy of law as well.

Eighthly, the pursuits, subsequent to the advice of the clinical counsel, are likely, in majority of cases, to trigger frequent races to some court. In the result, he may sit back and abandon the venture as ‘unwept, unhonored and unsung’.

Lastly, the point for probe is whether the costs involved in the operationalization of the system do measure up to the beneficial trickles. The answer should be a definite ‘no’.

Despite all the above mentioned locks, clocks and blocks, the clinical education in law is, paradoxically, lauded at all juristic counters of the world of the day. Presently it is looked upon as much an essential method of teaching law as a new tool of legal therapy to undertake doctrinal analysis, to make policy choices essential to lawyer-roles as apparent for a socially relevant legal education for the future. These clinics can venture on service to public agencies dealing with welfare, prisons, social services etc. Where the authorities may be well disposed to receive fresh ideas, critiques and evaluations; “by Prof. Kenneth-L Penegar, while recommending the steps to facilitate the transition for clinical education at the Annual Meeting of the Association of American Law Schools in 1981.

Legal aid camps-steps to clinical experiences

Clinical Legal Education’, which to accomplish, the following steps need consideration for, ultimately, being adhered to:

1) The two -tier system, of 5-year or 3-year LL.B.course, be off the track and every aspirant, whether graduate or under-graduate must submit and subscribe to the former.

2) The last of the 5 years be set apart for clinical pursuits.

3) There be a distinct department of ‘Clinical Legal Education’ housed in a separate building within the campus.

4) Building be full with structural and infrastructural amenities for purposes of organizing ,in mock style, clinical programmes in the nature of moot courts, Lok Adalats, criminal & civil trials, legal aid camps.

5) The earlier pass-outs and aspiring novices from the Bar be, also, accommodated on request and payment of nominal fees. Their attendance and participation be ensured to be regular without any, real or supposed, truancy.

6) Faculty be drawn from among the (a) trained professors, (b) experienced members of the Bar, and(c)retired judges/judicial officers-their terms being on salary or honorarium as ruled or regulated.

7) Funding be the responsibility of the law school/college/ university concerned.

8) Indoor exercises, theoretical as well as practical, be followed and supplemented, in due course of time, by field-work in the form of reaching legal services to the people hit by some natural calamity. Custodial victims, rural illiterates and persons requiring some more service-oriented help and spot- learning in the chamber
of lawyer(s) qua factual investigation, legal drafting, criminal and civil procedures, tricks of adversary litigation and moral values of legal profession.

Upon maturing such a backdrop, the legal education in India ought to get legally as well as clinically, democratized to serve “We, the People of India...” The transition is, of course, to involve much time and energy for the sake of planning, developing and executing.

Conclusion

Unfortunately, India is not rising fully to the occasions of clinical philosophy, although serious efforts are on to develop and expand wide-ranging clinical programmes. Earlier, legal training of the professionals was in the prerogative of the colonizing power and laid by haphazard. There were no programmes of standard in British India. In independent India, the practical legal training became, placidly, formalized, albeit not without many an affront. It was in 1977, the Committee on National Juridicature proposed and insisted upon law schools to participate in legal aid activities believing that law school clinics would offer the opportunity not only to provide skills-training, but would also, be able to sensitize students towards the broader social obligations of the legal profession11, (Government of India, 1973 & 1977). In 1981, the Committee for Implementing Legal Aid Schemes concluded with the same litigation oriented legal aid programs. As under draft of National Education Policy 201912, it is stated that the function of the legal education is to inculcate the values of Indian democracy in law students.

Let all hands, high and low, white and black, rich and poor and so on, join to create sensitivity to the cry for law reforms and focus on community’s perceptions and experiences on issues of relevance to the domain of clinical legal education.

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Ethical Clearance- Taken from Research Committee, Amity Law School, Amity University, U.P. India

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Effectiveness of an Educational Package on Health Promotion Behaviours of Mothers of Asthmatic Children in Karnataka, India: A Quasi Experimental Study

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Abstract

Background: Asthma education for mothers of asthmatic children is one of the cornerstones of management of childhood asthma. Empowering mothers with health promotion behaviors can reduce recurrent asthma exacerbations and improve health outcomes of asthmatic children.

Objectives: To assess the health promotion behaviors of mothers of asthmatic children, and to determine the effectiveness of an educational package on health promotion behaviors.

Method: A quasi- experimental design with block randomization was used to collect data from a sample of mothers (N=80) distributed between the experimental (n=40) and control (n =40) group. The study was conducted in the Pediatric Outpatient Departments of selected hospitals. A Baseline Proforma and a Health Promotion Behaviors scale was used to collect data. The educational package (information booklet and video) was administered to the experimental group and the control group received routine care.

Results: The post-test mean health promotion behavior scores of the experimental group 87.58 ± 3.30 (CI: 86.52 - 88.63) was significantly higher than that of the control group 79.00± 5.98 (CI: 77.09 - 80.91). The two-factor analysis of variance for repeated measures and the Post hoc Bonferroni test showed statistically significant improvement in the experimental group compared to the control group.

Conclusion: The education package was effective in improving the health promotion behaviors of mothers of asthmatic children. Pediatric outpatient units can utilize the educational package to promote the health and quality of life of asthmatic children.

Keywords: Bronchial asthma, Educational package, Health promotion, Health behavior.

Introduction

Asthma is the most common and potentially serious non – communicable chronic disease among children. According to the World Health Organization (WHO) globally around 235 million people currently suffer from asthma.¹ India has an estimated 15 – 20 million asthmatics with an estimated prevalence ranging between 10% to 15% in 5-11-year-old children.² The strongest risk factors being genetic predisposition and indoor and outdoor environmental exposure to respiratory irritants that provoke allergic airway reactions and cause exacerbations.¹ In the year 2015, the overall morbidity burden of asthma was estimated at nearly 65 million and more than 82,000 deaths were due to asthma. The burden of asthma was highest among individuals living in households using solid fuels (firewood~80%,
Asthma in children is rapidly rising with an estimated prevalence of 18.2%, but the disease still remains highly underdiagnosed in children. Although asthma is not curable, the symptoms and episodic attacks can be prevented with appropriate health promotion behaviors. However, most parents lack adequate knowledge on the appropriate behaviors that can be implemented to promote the health of their children. Generally, children with poorly controlled asthma have an increased risk of poor academic performance due to increased number of missed school days, and psychological and behavioral problems such as anxiety and decreased self-esteem. Pediatric asthma can cause disruption to the family and loss of productivity at the work place. Hence, pediatric asthma education can have a positive effect on caregiver management behavior.

Interventions aimed at teaching families’ better asthma management approaches may have the potential to alter biological profiles in children. Education on optimal home management of asthmatic children involves controlling the triggers, accurate symptom identification followed by timely and appropriate treatment. This influences their quality of life by preventing frequent exacerbations, and helping them to have normal lives as other children. Sweet et al. conducted a study to implement a multifaceted home-based intervention for 115 parents of asthmatic children with a goal of improving asthma outcomes by controlling indoor asthma triggers in the home environment. Data was collected at baseline and 6 months following the intervention. The findings revealed significant reduction in asthma symptom days, nighttime awakenings, days with activity limitation and albuterol use. There was significant reduction in emergency department visits, missed school days, and caregiver missed work days with improvement in caregiver quality of life. Another study by Williams et al. also implemented an educational intervention for parents of asthmatic children during emergency department visits to improve their understanding of the child’s asthma severity. They found that the intervention group who received the educational session had significant improvement in outpatient follow-up rate (50% vs. 20.8%, \( P < 0.001 \)) compared to the control group who did not receive the educational intervention. The current study was conducted to assess the existing health promotion behaviors of mothers of asthmatic children and to determine the effectiveness of an educational package on health promotion behaviors.

**Material and Method**

A quasi-experimental pretest posttest control group design was used. The study was conducted in the pediatric outpatient departments of two selected hospitals in Dakshina Kannada and Udupi districts in Karnataka (India). The purposive sampling technique was used to select mothers of children diagnosed with persistent asthma. Persistent asthma was defined as the severity of asthma as classified by Global Initiative Network for Asthma (GINA) guidelines as mild persistent, moderate persistent and severe persistent asthma and as diagnosed by the physician. Written informed consent was obtained from the mothers who were willing to participate in the study. Thereafter the mothers were randomized (n=40) to the experimental and control group by block randomization. On the first day (pretest), the Baseline Performa and the Health Promotion Behaviors rating scale was administered to the participants. The rating scale was developed by the researchers to assess the extent to which the mothers of asthmatic children adopted healthy behaviors at home in order to promote the health of their children. The scale consisted of six areas of health promotion and these were: environmental control (11 items); physical activity (5 items); self-care (3 items); medication (2 items); emotional support (2 items); and preventive measures (9 items). The validity and reliability of the tool was established before it was administered to the mothers. After completion of pre-test data collection, participants in the experimental group received the educational package (information booklet and video on childhood asthma and health promotion behaviors) in a private area in the outpatient department, and those in the control group received routine care. The intervention (educational package) involved individualized administration of an information booklet and video which included an introduction on the respiratory system, an overview of asthma (meaning, triggers, mechanism and effect of bronchial obstruction, signs and symptoms, diagnosis, and treatment), techniques of drug administration, common side effects and dangers of noncompliance, prevention and control measures/ health promotion behaviors, and when to consult a doctor. The post-test data was collected at 180 days after the intervention for both groups and using the same rating scale.
**Statistical Analysis**

Mean, Standard deviation, Median, two factor ANOVA for repeated measures and Post hoc Bonferroni test for comparison of effect within and between groups for pretest and posttest health promotion behavior scores of experimental and control groups were computed.

**Results / Findings**

**Sample characteristics**

The mean age of participants (mothers) in the experimental group was 37.73 ± 5.68 (CI: 35.91 - 39.54) and in the control group it was 36.35 ± 5.34 (CI: 34.64 - 38.05). The majority of participants in both groups were between >30-40 years of age. Most of the mothers in the experimental group (27.5%) had high school education, and an equal percentage had intermediate level of education. There were 22.5% graduates / postgraduates in this group. In the control group, 37.5% had high school education, there were 20% mothers with intermediate level of education and 27.5% with graduation/post-graduation. The majority of mothers in both groups were housewives, and the other detailed description of the sample has been previously reported.¹²

**Effectiveness of the educational package towards health promotion behaviors**

The summary of the pre and posttest health promotion behavior scores of both groups is presented in Table 1. A comparison of the control and intervention group pre-test mean health promotion behavior scores showed no significant difference (M=78.68±6.81; CI: 76.50 - 80.85) and (M=79.60 ± 4.88; CI: 78.04 - 81.16) respectively. The posttest mean health promotion behavior score in the experimental group (M = 87.58 ± 3.30; CI: 86.52 - 88.63) was significantly higher than the posttest mean score (M= 79.00 ± 5.98; CI: 77.09 - 80.91) of the control group. The mean percentage of the posttest in the experimental group was 91.23% when compared to the pretest which was 82.92%. In the control group mean percentage of the posttest was 82.29 % and the pretest was 81.96%. There was an increase in health promotion behavior scores in the experimental group (8.31%) and minimal increase (0.33%) in the control group.

<table>
<thead>
<tr>
<th>Health promotion behavior Scores</th>
<th>Mean ± SD</th>
<th>Median</th>
<th>SEM</th>
<th>95% CI for Mean</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental group (n= 40)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>79.60 ± 4.88</td>
<td>79.50</td>
<td>.772</td>
<td>78.04 - 81.16</td>
<td>82.92</td>
</tr>
<tr>
<td>Posttest</td>
<td>87.58 ± 3.30</td>
<td>88.00</td>
<td>.522</td>
<td>86.52 - 88.63</td>
<td>91.23</td>
</tr>
<tr>
<td><strong>Control group (n= 40)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>78.68± 6.81</td>
<td>79.50</td>
<td>1.08</td>
<td>76.50 - 80.85</td>
<td>81.96</td>
</tr>
<tr>
<td>Posttest</td>
<td>79.00± 5.98</td>
<td>79.00</td>
<td>.95</td>
<td>77.09 - 80.91</td>
<td>82.29</td>
</tr>
</tbody>
</table>

The median, quartiles and range of scores on health promotion behavior is depicted in the Box and Whiskers plot as in Figure 1. The median of posttest health promotion behavior scores in the experimental group (88.00) were significantly higher than the pretest median (79.50). The posttest scores ranged from 80.00 to 94.00, and the pretest scores range from 73.00 to 89.00. In the control group the posttest median 79.00 was lower than the pretest median 79.50. The posttest scores ranged from 64.00 to 90.00 and the pretest scores range from 62.00 to 90.00.
Fig 1: Box and Whisker plot showing the median, quartiles and range of pretest and posttest health promotion behavior scores in the experimental and control group

The effectiveness of the educational package in terms of improvement in health promotion behavior was determined by computing the two factor ANOVA for repeated measures and Post hoc Bonferroni test. The two factor ANOVA for repeated measures results presented in Table 2 shows that there was significant improvement from the mean pretest to posttest health promotion behavior scores within groups (F= 59.187, p< 0.01). A significant difference in health promotion behavior scores between the experimental and control group was also found (F= 50.280, p< 0.01).

Table 2: Two factor ANOVA for repeated measures of health promotion behavior scores

<table>
<thead>
<tr>
<th>Health promotion behavior scores</th>
<th>F Value</th>
<th>df</th>
<th>p</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference from pretest to posttest</td>
<td>59.187</td>
<td>1,78</td>
<td>.000</td>
<td>S</td>
</tr>
<tr>
<td>Difference between experimental (n=40) and control group (n=40)</td>
<td>50.280</td>
<td>1,78</td>
<td>.000</td>
<td>S</td>
</tr>
</tbody>
</table>

Further within and between groups pairwise comparisons were done by computing the Post hoc Bonferroni test as shown in Table 3. Significant improvement in health promotion behavior scores from pretest to posttest was found only in the experimental group (p < 0.01) with mean difference 7.98 (CI: 6.19 – 9.76) and not in the control group with mean difference .33 (CI: .93 – 1.58), respectively. When the mean improvement between the experimental and control group was compared the Bonferroni test showed significant difference in scores between experimental and control group (p < 0.01) with mean difference 7.65 (CI: 5.50 – 9.80) indicating significant improvement in health promotion behavior in the experimental group.
than in the control group.

Table 3: Comparison of effect of health promotion behavior scores within and between groups.

<table>
<thead>
<tr>
<th>Health promotion behavior scores</th>
<th>Mean Difference</th>
<th>SE_{MD}</th>
<th>95% CI for difference</th>
<th>Bonferroni test p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=40) Pretest to Posttest</td>
<td>7.98</td>
<td>.882</td>
<td>6.19 - 9.76</td>
<td>.000</td>
</tr>
<tr>
<td>Control group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=40) Pretest to Posttest</td>
<td>.33</td>
<td>.622</td>
<td>.93 - 1.58</td>
<td>.604</td>
</tr>
<tr>
<td>Between experimental and control group</td>
<td>7.65</td>
<td>1.079</td>
<td>5.50 - 9.80</td>
<td>.000</td>
</tr>
</tbody>
</table>

Discussion

The findings of the study revealed that the posttest mean health promotion behaviour scores was higher than the pretest mean health promotion behaviour scores only in the experimental group (87.58 ± 3.30 vs. 79.60 ± 4.88). In the control group the scores were almost similar (79.00 ± 5.98 vs. 78.68 ± 6.81) in pretest and posttest. An increase of 8.31% in the experimental group and only 0.33% in the control group was found. The education package used in our study was effective in improving the health promotion behavior of mothers of children with asthma.

The findings of our study concur with those of other studies using similar interventions. Zuniga et al\textsuperscript{13} in their non-randomized, longitudinal study tested the effectiveness of an educational intervention on 115 parents of Head Start children with or without an asthma diagnosis. The results of the follow-up survey after 6 months of the educational intervention showed a statistically significant increase in asthma and healthy home-knowledge (p < 0.001) in several areas. Moreover, at 6 months’ post-intervention 98.4 % of them made changes in their households as a result of their training.\textsuperscript{13} A nonrandomized longitudinal study was conducted in Rio Grande Valley of Texas in which an Asthma and Healthy Homes educational intervention training (N= 89) was implemented for parents of children from low income families. Significant changes were found in the behaviour among participants who received the training.\textsuperscript{14}

Tzeng et al\textsuperscript{15} in their study on the effectiveness of a nurse-led patient-centered asthma education programme on home environmental control behaviours of parents of children with moderate or severe asthma found that the level of improvement in dust and cleaning methods was significantly greater among parents in the experimental group than among those in the comparison group (p < 0.05). Children with moderate or severe asthma in the experimental group had fewer signs/symptoms of asthma and better lung function than children in the comparison group. Similarly, Jones et al\textsuperscript{16} tested an asthma education program in 204 underserved Latino families with an asthmatic child and found that participants made significant change to the child’s bedroom environment leading to reduction in mean triggers from 2.4 to 1.8, p<0.001 and increase in mean number of controller (0.7 to 0.9, p<0.001) medications. The present study found improvement in health promotion behaviours scores after the implementation of the educational package, indicating better health practices adopted by mothers at home.

The above discussion shows that educational interventions can bring about significant changes in parental behaviors and in promoting the health of their asthmatic children.

Conclusion

The study results showed that the educational package was effective in improving health promotion behaviours of mothers of asthmatic children. Statistically significant improvement was found in mothers who received the educational package compared to the control group. Thus well designed asthma education programs for parents of asthmatic children are a good strategy for improving health promotion behaviors and the health of the affected children.
Conflict of Interest - The authors declare that there is no conflict of interest in this study.

Source of Funding – This study was a self-funded project

Ethical Clearance: Ethical clearance was obtained from the Institutional Ethics Committee, Kasturba Hospital Manipal. Formal administrative permission was obtained from the Heads of selected Hospitals and Departments. A written information sheet regarding the study was given to the mothers prior to obtaining consent. A signed written informed consent form was obtained indicating voluntary participation in the study.

References
The Investigation of Biochemical Parameters and Alteration of Fatty Acid Metabolism Genes From Diabetes Individuals

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Abstract

Introduction: Diabetes mellitus is characterized by absolute or relative insufficiencies in insulin secretion and/or its action associated with chronic hyperglycemia and disturbed carbohydrate, lipid and protein metabolism.

Aim: This case control study was conducted involving 20 patients diagnosed with type 2 diabetes mellitus (T2DM) and 20 healthy individuals. The peripheral blood mononuclear cells were used for study the expression profile of fatty acid metabolism genes.

Material and Method: In this case control study, involved twenty diabetes (T2DM) individuals and twenty healthy controls. The serum was subjected for different biochemical assays and molecular study include an expression profile of fatty acid metabolism genes.

Results: Diabetes patients showed a significant increase (P≤0.001) in fasting serum glucose than healthy control. Serum total cholesterol (P≤0.01), triglyceride (P≤0.001) and VLDL (P≤0.001) was increased significantly in diabetes patients as compared to healthy individuals. However, HDL and LDL cholesterol levels were decreased. Liver enzymes such as SGOT and SGPT (P≤0.001) along with kidney markers creatinine and urea (P≤0.01) were increased in diabetes patients as compared to healthy individuals. The Sterol regulatory element-binding protein 1 (SERBP-1c) expression was found to be upregulated in the diabetic condition. Hence, the genes regulated by SREBP-1c i.e. fatty acid synthase (FASN) and acetyl-CoA carboxylase (ACC) was also found to be upregulated.

Conclusion: The expression profiles of PBMCs can be applied for the study of quantitative differences and similarities between T2DM patients and non-diabetic individuals. This leads to contribute with new perspectives for a better understanding of the disease.

Keywords: Diabetes, lipid profile, fatty acid synthase, acetyl-CoA carboxylase, kidney markers

Introduction

Diabetes mellitus (DM) is an epidemic disease. Diabetes is a metabolic disorder characterized by hyperglycemia as results of the insulin resistance and lack of the insulin. It is currently estimated that diabetes prevalence by 2030 will include 439 million adults worldwide. Three types of diabetes are reported viz. Gestational diabetes, type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM). Type 2 diabetes mellitus begins with insulin resistance, a condition in which cells fail to respond to insulin properly. As the disease progresses a lack of insulin may also develop. Out of these three types of diabetes, type 2 diabetes mellitus is most prevalent. Type 2 diabetes or hyperglycemia is mostly the result of defects in insulin secretion or defect in insulin action or many a times both the defects exists.
Diabetes and its associated complications are closely related and often not considered separately. Diabetes is associated with macrovascular and microvascular complications. Diabetic nephropathy is diabetic complication in which albuminuria is caused due to impaired glomerular filtration rate. Due to this abnormal function is caused in the tubules which caused glomerular damage. Diabetic neuropathy is likely caused more by abnormalities in neuronal cells dysfunction. These abnormalities were also reflected on the gene expression level. For gene expression study, PBMCs are readily accessible cellular material in human. Alternative cellular material, getting from invasive tissue biopsies, which is not feasible or even possible in healthy volunteers for ethical reasons. It may reflects gene expression adipocytes or hepatocytes and also shows the responses of dietary modifications and drugs treatments at the level of gene expression. Earlier studies revealed that PBMCs can display gene expression characteristic for certain diseases like atherosclerosis. Currently sulphonylureas and metformin are the mainstays in the treatment of T2DM and represent the most commonly used oral hypoglycaemic agents (OHAs). Metformin and glibenclimide are the only OHAs included on the WHO list of essential medicines, helped in part by their availability as generics.

With this background, we aim to study the biochemical alteration and gene modulation in the healthy and diabetes individuals. The serum glucose, lipid profile, liver function test and kidney function markers were evaluated from the serum sample. The expression of some genes also evaluated in the present study.

**Materials and Method**

In the present study, diabetic and healthy individuals were screened for the blood biochemistry and molecular alteration near area of Pune, Maharashtra, India.

**Participant enrollment**

From the diabetic patients and healthy participants, fasting blood (n=20 each) was collected by a single puncture once for each individual after obtaining informed consent. Age and gender matched healthy control (n=20) participant was recruited for the present study.

T2DM patients consider the age group between 23-60 years (Fasting Plasma Glucose (FPG) ≥ 126 mg/dl) (As per the ADA guidelines). Individuals with HIV/ HBsAg, underweight (BMI ≤ 18.5), with any bodily injury and/or wounds, post surgical and alcoholic were excluded from the study.

**Blood collection and separation of serum/plasma sample**

After getting participant consent, blood was collected (2ml) in the plain and EDTA vacutainers from the vein. Then plain vacutainer was kept at room temperature (RT) for 30 min for blood cloting. Then samples were centrifuged at 2000rpm for 15 min at RT. Then serum was pipette out in clean eppendorf tubes and kept at 20°C for further study.

Blood was collected in EDTA vacutainers and overlay on histopaque density gradient medium. Then blood was subjected to centrifugation at 1550rpm (Histopaque-1077 gradient, Sigma–Aldrich). The white PBMCs layer was separated and dispenced in trizol reagent for the RNA isolation.

**Blood biochemistry from serum**

Serum sample was used to assess various biochemical parameters such as, glucose, total cholesterol (TC), triglycerides (TGs), LDL cholesterol, HDL cholesterol, urea, creatinine, and enzymes like serum glutamic pyruvic transaminase (SGPT), glutamic oxaloacetic transaminase (SGOT), by using commercially available kits (Coral Clinical Systems, Goa, India).

**Molecular analysis from isolated peripheral blood mononuclear cell (PBMC)**

The RNA from the PBMC’s was extracted by using TRIZOL method (Invitrogen CA, USA) as per the given protocol. Quality of RNA was determined on 0.8% agarose gel electrophoresis. Then, quantity of RNA was measured using spectrophotometer (NanoDrop ND-1000, Eppendorf, Germany). The c-DNA was synthesized from isolated RNA by using the SuperScript first-strand synthesis kit (Invitrogen, CA, USA) as per the suppliers protocol. The synthesized cDNA was used for the analysis of expression profiles of selected genes by quantitative real-time PCR.
i) Gene selection

Transcription factor, namely Sterol Regulatory Element-Binding Proteins (SREBP) were regulating fatty acid metabolism gene viz. Fatty Acid Synthase (FASN) and Acetyl-CoA Carboxylase (ACC) were selected for the study. The primers used in the present study are depicted in the Table 1. The qPCR analysis was performed with the help of a StepOnerealtime PCR system (Applied Biosystems, CA, USA) along with SYBr gene expression assays (Applied Biosystems, CA, USA).

Table 1: Primer sequence of selected genes

<table>
<thead>
<tr>
<th>SrNo.</th>
<th>Primer name</th>
<th>Sense</th>
<th>Sequence(5'----3')</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Housekeeping gene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Glyceraldehyde-3-phosphate dehydrogenase</td>
<td>Forward</td>
<td>AGTTCAACGGGCACAGTCAAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse</td>
<td>TACTCAGCACCAGCATCACC</td>
</tr>
<tr>
<td></td>
<td>Transcription factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Sterol Regulatory Element-Binding Proteins</td>
<td>Forward</td>
<td>AAACCTGAAGTGAGTAGAAAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse</td>
<td>TTATCCTCAAAGGCTGGG</td>
</tr>
<tr>
<td></td>
<td>Fatty acid metabolism genes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Fatty Acid Synthase</td>
<td>Forward</td>
<td>AAAAGGAAAGTAGAGTGTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse</td>
<td>GACACATCTGTCGACTAC</td>
</tr>
<tr>
<td>2.</td>
<td>Acetyl-CoA Carboxylase Alpha</td>
<td>Forward</td>
<td>AGCAGTATTTGAACACAT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse</td>
<td>CAGTTCAAAGAAGTGAG</td>
</tr>
</tbody>
</table>

Statistical Analysis

All samples were analyzed in triplicates. The data were subjected to statistical analysis using GraphPadInstat (3.0, Trial Version). Results were presented as Mean ± Standard Error (SE). The unpaired t test was performed to estimate the statistical significance.

Results

Diabetic (n=20) and healthy individuals (n=20) were recruited in the present study after their consent. The fasting venom blood was collected and evaluated for various biochemical assays.

Assessment of Serum Glucose

Serum glucose was significantly increased (P≤0.001) in the T2DM individuals as compared with the healthy individuals. The serum glucose level is shown in the Figure 1.

Figure 1: Serum glucose of healthy and diabetic individuals

Assessment of serum lipid profile

Serum cholesterol level of healthy and diabetic individuals is depicted in Figure 2. The serum cholesterol, triglyceride, LDL and VLDL levels were elevated in diabetic individuals as compared to healthy individuals. The diabetic individuals showed non-significant decrease in serum HDL levels as compared to healthy individuals.
Figure 4: Serum creatinine and urea levels of healthy and diabetic individuals

Gene expression analysis of fatty acid metabolism gene along with their transcription factor

Figure 5 depicted the expression of Sterol regulatory element-binding protein (SERB1c), Fatty Acid Synthase (FASN) and Acetyl-CoA Carboxylase (ACC) genes. All these genes showed upregulation in their expression level.

Discussion

In the present study, we evaluate the biochemical variations and molecular alteration in the fatty acid metabolism genes in the type 2 diabetes mellitus patients and their respective healthy control. In the present study, serum glucose, TC, TG, LDL and VLDL levels were found to be increased in the diabetes patients. Though, all diabetic patients were on different medication and still they exhibits elevated blood glucose. The age and gender match was one of the basic criteria for the enrollment of patients or healthy subjects. This criteria was reported by various authors previously. In the present study, the same age and gender criteria was followed for the selection of healthy subjects.
The delay in the first phase of insulin secretion, although of some diagnostic import, does not appear to act independently in the pathogenesis of type 2 diabetes. In some early-onset patients with type 2 diabetes (perhaps as many as 20%)\textsuperscript{17,18}, there may be a deficiency in insulin secretion that may or may not be due to autoimmune destruction of the β-cell and is not due to a deficiency in the glucokinase gene. In the great majority of patients with type 2 diabetes (±80%), the delay in immediate insulin response is accompanied by a secondary hypersecretory phase of insulin release as a result of either an inherited or acquired defect within the β-cell or a compensatory response to peripheral insulin resistance.

Abou-Seif and Abd-Allah\textsuperscript{19} investigates the relationship among diabetes mellitus, lipid profiles, nitric oxide activity, pancreatic amylase activity and antioxidant status in fifty-five non-insulin-dependent and forty insulin-dependent diabetes mellitus (DM) and twenty non-diabetes individuals. The serum total cholesterol, triglyceride and low-density lipoprotein-cholesterol were higher in both types of diabetes mellitus in comparison to the control subjects. However, there is simultaneously decreased in the serum high-density lipoprotein-cholesterol (HDLc) levels in both types of diabetes mellitus. Our results are accordance with this report. It PBMCs may represents a similar gene expression as of adipocytes or hepatocytes and also demonstrate the responses of dietary modifications and drugs treatments at the level of gene expression\textsuperscript{11}.

Transcription factors such as SREBPs involved in the regulation of fatty acid and cholesterol metabolism in the liver. SREBPs consist of two isoform i.e SREBP1 and SREBP-2. SREBP-1 having two isoforms which included 1a and 1c. SREBP-1c is relatively abundant in the liver. Up regulation of SREBP-1a gene expression has been shown to result in the increased production of cholesterol and TG\textsuperscript{8}, while over expression of SREBP-1c resulted in elevated level of TG\textsuperscript{9}. Our results are accordance with this report. We have observed phenomenon in PBMC’s and agree with statement of Shimomura et al.\textsuperscript{20} elevated expression of lipogenic genes, acetyl-CoA carboxylase (ACC) and fatty acid synthase (FAS) in diabetic mice following the over expression of SREBP 1c. FASN is the central enzyme in de novo lipogenesis, catalysing the conversion of malonyl CoA into palmitate.

**Conclusion**

In the present study, elevated levels of serum glucose and lipid profile were observed as compared to the healthy control. The serum HDL level was significantly decreased as compared to healthy control. The fatty acid metabolism genes were also found to be upregulated. This may be one of the reasons for elevated lipid profile. The diabetes patients, which are recruited in the present study, are on allopathic medications. Such as, metformin, glibenclamide, statin etc. These drugs are known for their target action and some adverse side effects also, when recommended for long term use. So, there is still scope for better drug management strategy, which will have low or no side effects. The expression profiles of PBMCs can be applied for the study of quantitative differences and similarities between T2DM patients and non-diabetic individuals. This leads to contribute with new perspectives for a better understanding of the disease.

**Ethical Clearance:** The blood was collected from the pathological laboratory after their investigation. Oral consent was taken before enrolled the patients in the study.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


5. Goldenberg, Ronald, and Zubin Punthakee. “Definition, classification and diagnosis of diabetes,


The Relationship between Mobile Phone & Laptop Use on Physical Well-Being of College Students in India

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Abstract

As the use and access of technology is increasing among the college population, researchers began to assess the effect of technology on the health, behaviour and the health status of the student population. Playing mobile games, surfing the net, visiting social networking sites are defined traditionally as sedentary behaviours. The relationship which were of interest to the researchers are use of Mobile/laptop by college students and its impact on Physical well-being of these students.

The present study presents results which are of utmost importance to students, parents, colleges, institutes etc. We are living in an era of technological disruptions where technology is paving its way in all walks of life and education is not untouched. Mobile and laptop has not only changed the education system and its delivery mechanism but also student’s behaviour and their health, which is part of this study. It has impacted students and teachers at the same time.

The results of the study show that there is significant difference in mobile usage and use of mobile for gaming purpose among under graduate and post graduate students. It was also found that usage of WhatsApp application on mobile has negative impact on the physical well-being of college students of India. Further it was concluded that there is negative relation between self-perception of physical activity and physical well-being of these students. The mobile penetration in last few years which has impacted significantly each branch of society; banking transaction, social media, interaction as well as education.

Keywords: College Students, Physical well-being, Mobile, laptop, WhatsApp

Introduction

College students, today, have increasing access to technology. These students are the pioneers in consumption of technology with 98% of students reporting using a computer in the present study. 100% of students reported they owned and used mobile devices and 98% reported owning and using a laptop. The mobile phone is an electronic device which can perform high speed data operations and can also perform logical, arithmetic and storage function. The usage of internet has increased exponentially in case of the youth. Additionally, half of today’s youth access internet via their mobile devices, which helps them facilitate online browsing. Use of mobile tends to help people move towards sedentary behaviour and those who have huge amount of sedentary behaviour, tend to be less active, physically. Lepp et. al concluded that those college students who were using mobile more were less physically fit than those students who were using mobile less [¹].

DOI Number: 10.5958/0976-5506.2019.01886.2
The data collected using the questionnaire for this research suggested that use of mobile and laptop affects their physical activity. For example, one participant said, “we are addicted, no doubt”, while another participant said, “We are in the era where phones and laptops have become an important part of life and it varies from person to person on how they make use of it. But it surely helps us in many ways”.

Mobile phone has been adopted at fastest pace among college students and the frequencies at which these mobile phone operate lead to harmful effects on their health and behaviour. Academic performance was negatively impacted due to higher use of mobile and it also led to higher level of anxiety among college students \cite{2}. Female students had shown more negative impact of excessive use of internet and mobile phone among undergraduate students of Ramon Llull University of Spain. It was also reported that the students of broadcasting and journalism had negative impact of excessive use of internet and mobile phone in comparison to the students of other disciplines. The variance of the general indicators of psychological distress were also explained by the Perceived Emotional Intelligence, but to a lesser degree than the maladaptive use of the Internet and the Mobile Phones \cite{3}.

**Mobile/laptop use and physical well-being**

Lepp \cite{1} has confirmed that people with more usage of cell phones are more likely to show sedentary behaviour rather than participation in physical activities than those whose cell phone usage is less. In comparison to all other nations, Korean students had scored low in life satisfaction and affective well-being in a survey conducted on 350 students \cite{4}. Another study which was performed on 145 Canadian students by Steven et al (2010) concluded insufficiently active students had higher levels of fatigue and lower level of vigour in comparison to active students.

Penedo \cite{5} performed a review of the existing literature on physical activity, exercise and physical and mental health where they validated physical activity and exercise have benefits on physical and mental health outcomes. Those who were active in their regular physical activity have reported desirable health outcomes.

Irwin \cite{6} administered a survey to university students with an objective to measure prevalence of physical activity at a level which is necessary for health gains for at least one month. It was found that majority of the students were physical less active, and this may lead to other serious health problems. He emphasised that there is a greater need for interventions in order to improve physical activity in this population. Based on the literature review, the following hypotheses are presented:

**H1: Usage of mobile phone/laptop does not differ significantly across different level of education of college students in India**

**H2: Usage of mobile for WhatsApp Application is negatively correlated to physical well-being of college students in India**

Mental and social well-being of college students improves due to physical activity and participation in sports as reported by previous research while present research reported that the students who participated in athletics and team sports had very low depression scores \cite{7}. There exists a positive relation between Facebook usage and social adjustments among students of undergraduate programme while at the same time there is a negative impact of Facebook on physical health. Students who were in first year spent more time on Facebook, had fewer friends and were emotionally strongly connected than final year students. There was a positive impact of using Facebook for connecting with peers on students during later stages of their life in college \cite{8}.

Bianchi \cite{9} conducted a research which highlighted the problems of excessive use of mobile and its impact on physical and mental well-being of adults and youngsters. They tried to establish relationship between extraversion, self-esteem, neuroticism, gender, age and excess mobile use and results reported that neuroticism could not predict higher use while extraversion and low self-esteem were important factors. Mobile phone usage was found to high and problem use in case of young people.

White \cite{10} conducted a study whose purpose was the relation between sleep time and mobile use in college students. The study reported that various aspects of mobile phones like addictive text messaging, problematic messaging, and problem mobile phone use are related to sleep quality, which will negatively impact the health of
the user. As today’s youth are the most technologically oriented group, they are also the most sleep deprived.

Vandelanotte [11] studied the use of internet and computers and its relation with obesity and overweightness. The respondents who use internet and laptop for low time, had active behaviour i.e. low sedentary behaviour while participants who used more internet and high leisure time were 1.46 times more likely to be overweight and 2.52 times more likely to be obese. There is a need for decrease in internet usage which will have a positive impact on the sedentary behaviour among youth.

H3: Self-perception about physical activity is positively and significantly correlated to physical well-being of college students in India

Materials and Method

Objective

There has been a growing concern about usage of mobile and laptop among college students. Most of the students are so addicted to these devices that it hampers their life. This became the need of the study and study is being conducted with following objectives:

- To understand the mobile and laptop usage among undergraduate and post graduate college students
- To study usage of WhatsApp application and its impact on physical well-being of college students in India
- To observe relation between self-perception about physical activity and physical well-being of college students in India.

Participants and procedures

The participants were undergraduate and post graduate students from different college of India. The students were from technical (B.Tech/B.E: Bachelor of Technology/ Bachelor of engineering) as well as from non-technical (programmes in commerce, economics, designing, etc.) background. The key variables of the study are “use of mobile and laptop on physical well-being of college students”. The researchers explained the purpose of the study to the respondents.

Measures

The survey used 2 sections to collect the participant’s response namely: demographic information, use of mobile/laptop[12]. Business students those who expected to be successful at materialistic ambition in comparison to other goals were found to be more unhappy most of the time (r=0.22, p<0.05) and had marginal higher anxiety (r=-0.19, p<0.10) [13]. Males had reported to have high depression who were low in the relative importance of intrinsic aspirations (p<0.05) [14].

Subjects

A total of 196 students pursuing their under graduation or post-graduation took part in the survey where 7 respondents did not complete survey, leaving total sample to be 187 and there were 126 male and 61 female students. The respondents were from all over India including metro city, tier I and tier II as well as tier III cities.

Findings and Discussion

Researchers have used the data collected from survey to test the hypotheses. The data was coded and uploaded in SPSS version 22 where statistical test were
Table 1: Level of study and Number of hours spent on mobile/laptop/gaming

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>Level_Study</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>No_of_Hours_Mobile</td>
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<td>93</td>
<td>3.613</td>
</tr>
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<td></td>
<td>2.0</td>
<td>94</td>
<td>3.074</td>
</tr>
<tr>
<td>No_of_Hours_laptop</td>
<td>1.0</td>
<td>93</td>
<td>2.430</td>
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<tr>
<td></td>
<td>2.0</td>
<td>94</td>
<td>2.638</td>
</tr>
<tr>
<td>No_of_Hours_Game_Mobile</td>
<td>1.0</td>
<td>93</td>
<td>1.022</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>94</td>
<td>.617</td>
</tr>
</tbody>
</table>

The first table shows means are higher for undergraduates than post graduates, which means they spend significantly more time on mobiles and games than the post graduates. The values are not found to be significant for usage of laptop. Undergraduate students are coded as 1 while postgraduate students are coded as 2. Undergraduate students spend 3.613 hours per day on average while post graduate students spend 3.074 hours per day on mobile. It is also found in the statistical result that undergraduate students spend 1.022 hours on playing games on mobiles while post graduate students spend 0.617 hours on playing games.

Table 2: Level of study and Number of hours spent on mobile/laptop/gaming

Independent Samples Test

<table>
<thead>
<tr>
<th>t-test for Equality of Means</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td>No_of_Hours_Mobile</td>
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<td>.006</td>
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<tr>
<td>No_of_Hours_laptop</td>
<td>-908</td>
<td>185</td>
<td>.365</td>
</tr>
<tr>
<td>No_of_Hours_Game_Mobile</td>
<td>2.427</td>
<td>185</td>
<td>.016</td>
</tr>
</tbody>
</table>

Table 2 shows t-test for equality of means among undergraduate and post graduate students. There is significant difference between undergraduates and post-graduates in the number of hours spend on mobile and number of hours spend on gaming on mobile. The difference was not found to be significant in terms of time spent on laptop. P value for number of hours spend on mobile is 0.06 while on playing games on mobile is 0.016 which are <0.05, thus the researcher rejected hypothesis that Use of mobile/laptop is positively and significantly correlated to level of education of college students in India. There is significant difference between undergraduates and post-graduates in the number of hours on mobile and number of hours on gaming.

Table 3: Use of WhatsApp Application and its impact on Physical Well-being

<table>
<thead>
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<th>Correlations</th>
<th>Physical_Wellbeing</th>
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<tbody>
<tr>
<td>Hours on WhatsApp</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

The college students spend a lot of time on WhatsApp application as it is seen from the survey results. Correlation analysis indicates that the usage of WhatsApp has a significant negative relationship with the physical well-being. Pearson correlation is negative (-0.209) and statistically significant at 0.01 level (P value < 0.01) as seen in table 3. Given these results the authors rejected H2 that use of mobile for WhatsApp Application is positively and significantly correlated to physical well-being of college students in India.

Table 4: Mean of Self-Perception about physical activity and physical well-being

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>Impact_Physical</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical_Wellbeing</td>
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<td>114</td>
<td>40.6404</td>
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<td></td>
<td>2.0</td>
<td>73</td>
<td>45.2877</td>
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</table>

Table 5: Self-Perception about physical activity and physical well-being

Independent Samples Test

<table>
<thead>
<tr>
<th>t-test for Equality of Means</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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<tbody>
<tr>
<td>Physical_Wellbeing</td>
<td>-2.902</td>
<td>185</td>
<td>.004</td>
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</tbody>
</table>
The results indicate that there is a significant difference on physical well-being (P value < 0.05) between those who think that technology has hampered their physical activity and those who think that technology has not hampered their physical activity (See Table 5). Further, the means in Table 4 indicate that those who think technology has hampered their physical activity have lesser means on physical well-being, and those who think that technology has not hampered their physical activity have higher means on physical well-being. This leads to rejection of H3 that self-perception about physical activity is positively and significantly correlated to physical well-being of college students in India.

**Conclusion**

The study took survey (by administering questionnaire) of college students in India. These respondents were from all over India pursuing their undergraduate degree programme or post graduate degree programme. A total of 187 responses were received and objective was to find the relation of mobile and laptop usage among college students. It is concluded that undergraduate students spend more time on mobile and gaming application in comparison to post graduate students. It was also found that use of mobile application, WhatsApp, has a negative impact on the physical well-being of college students. The students have a self-perception about their physical activity level. This was further tested with the help of statistical software and results show that there is negative relation between students’ self-perception of physical activeness and physical well-being.

**Limitations:** The limitation to the present research is that it is limited to college students in India. Another limitation is that it concerns only use of technology namely mobile and laptop and does not cover other areas.

**Conflict-of-Interest Statement:** We, authors of the manuscript titled, “The Relationship Between Mobile Phone & Laptop Use on Physical Well-Being of College Students in India” hereby declare that we don’t have any conflict of interest in writing, peer review and editorial decision making, nor we have any personal relationship with journal and its members.

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**References**


Divine Proportion of the Height of the Human Body Vs Navel Height

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Abstract

The golden ratio otherwise known as the Divine Proportion or Phi, is a mathematical ratio with special properties and aesthetic significance. An enormous number of things in the universe are engineered around the ratio, ranging from the human body to the ark of the covenant to snail shells to the orbits of the planets. The divine ratio and golden rectangles appear throughout the ancient architecture and art. The golden ratio is believed to be the most aesthetically pleasing and harmonious means of design. The Golden section, also known as Phi, is manifested in the structure of the human body. In the present study 50 normal subjects both male and female were randomly screened ranging 25 to 30 years in Chennai were selected. The total height of a subject from the plinth to the head end was measured using the height measuring scale with off shoes and straight stature and then the navel height from plinth to umbilicus was also measured. The data collected was tabulated and the total height divided by the navel height was calculated. The ratio obtained was 1.621 which is close to 1.618…. which is known as the golden ratio, golden proportion or divine proportion.

Keywords: Aesthetic, Divine Proportion, Measuring scale, Navel height, Plinth.

Introduction

Egyptians used the golden proportion, Phi in the constructions of the great pyramids and in the design of the hieroglyphs found on the tomb walls. The ancient inhabitants embraced Phi in the sun pyramids. The Greek used Phi in their architecture. Throughout the history, the ratio of 1.6180339887…. for the length-width of rectangle has been considered most pleasing to the eye. The golden section is a special ratio that is also called as Golden ratio, the Divine proportion, or the Golden rectangle.

The golden quantitative relation otherwise referred to as the Divine Proportion or alphabetic character, is a mathematical ratio with special properties and aesthetic significance. An enormous variety of things within the universe square measure designed round the quantitative relation, ranging from the human body to the ark of the covenant to snail shells to the orbits of the planets. The divine quantitative relation and golden rectangles seem throughout the traditional design and art. The golden quantitative relation is believed to be the foremost esthetically pleasing and harmonious suggests that of style. Statistical analysis indicates that “the people involuntarily provide preference to proportions that approximate to the quotient (Golden ration)¹.

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The Fibonacci numbers are Nature’s numbering system. They appear everywhere in Nature, from the leaf arrangement in plants, to the pattern of the florets of a flower, the bracts of a pinecone, or the scales of a pineapple. The Fibonacci numbers square measure so applicable to the expansion of each animate thing, including a single cell, a grain of wheat, a hive of bees, and even all of mankind. It plays an important role within the arrangement of petals in flowers, structure of DNA and various proportions in human face, structure of sea shells etc.

Occurrence of this proportion in biological science is frequent, viz within the clock cycle of brain waves, in hearing and balance organ etc. Here we tend to want to explore the mysterious secrets of golden quantitative relation hid within the human anatomy. If we tend to take the quantitative relation of 2 serial numbers in Fibonacci’s series, (1, 1, 2, 3, 5, 8, 13...), we will find the following series of numbers: 1 1 =, 2 1 = 2 3 2 = 1.5, 5 3 = 1.666... , 8 5 = 1.6, 13 8 = 1.625, 21 13 = 1.61538... . It is easier to see what is happening if we plot the ratios on a graph (Figure 1).

Likewise Phi is also studied in the height of the human body

**History**

Mathematician Mark Barr projected exploitation the primary letter within the name of Greek sculptor statue maker, phi, to symbolize the golden quantitative relation. Usually, the minuscule kind (φ or φ) is employed. Sometimes the majuscule kind (ᶲ) is employed for the reciprocal of the golden quantitative relation, 1/ᶲ.

The golden quantitative relation has fascinated Western intellectuals of various interests for a minimum of a pair of, 400 years. Some of the foremost effective mathematical minds of all ages, from philosopher and Euclid in ancient Greece, through the medieval Italian scientist Leonardo of city and therefore the Renaissance stargazer Johannes Kepler, to current scientific figures like Oxford man of science Roger Penrose, have spent endless hours over this simple ratio and its properties. But the fascination with the Golden quantitative relation isn’t confined simply to mathematicians. Biologists, artists, musicians, architects, psychologists, and even mystics have pondered and debated the premise of its presence and attractiveness. In fact, it’s most likely honest to mention that the Golden quantitative relation has galvanized thinkers of all disciplines like no different variety within the history of arithmetic.

Ancient Greek mathematicians initial studied what we tend to currently decision the golden quantitative relation because of its frequent look in pure mathematics. The division of a line into “extreme and mean ratio” (the golden section) is vital within the pure mathematics of normal pentagrams and pentagons. The Greeks sometimes attributed discovery of this idea to mathematician or his followers. The regular star, that incorporates a regular pentagon inscribed among it, was the Pythagoreans’ image. Euclid’s parts provides the primary noted written definition of what’s currently known as the golden ratio: “A line is claimed to own been cut in extreme and mean ratio when, because the whole line is to the larger phase, therefore is that the larger to the less.” geometrician explains a construction for cutting (sectioning) a line “in extreme and mean ratio”, i.e. the golden ratio. Throughout the weather, many propositions (theorems in trendy terminology) and their proofs use the golden quantitative relation. Some of these propositions show that the golden quantitative relation appears to be sinking right down to a selected worth, which we call the golden ratio or the golden number. The golden ratio 1.618034... is also known as the proportionality or the golden mean or simply the golden variety. It is usually delineated by a Greek letter alphabetic character φ.

In the shape, there are instances of the Fibonacci Phi (φ) although it has not been widely discussed. For example, the length of the primary finger joint to the length of consecutive 2 joints is adequate the length of the 2 joints to the length of the whole finger [4-6].

**Figure 1: Picturisation of convergence of Fibonacci series.**

The quantitative relation appears to be sinking right down to a selected worth, which we call the golden ratio or the golden number. The golden ratio 1.618034... is also known as the proportionality or the golden mean or simply the golden variety. It is usually delineated by a Greek letter alphabetic character φ.

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relation is Associate in Nursing real.

Aim

The aim of the present study is to determine whether the height of the individual is close to the golden proportion.

Materials & Method

Fifty subjects (both male and female) in the age range of 25 to 30 years residing in Chennai were randomly chosen as subjects. The following measurements were taken bare-footed, total height of a subject from the plinth to the head and the navel height from plinth to umbilicus. Healthy subjects having primary and secondary curve of spine were included in the study, while, those with pot belly, pregnancy, Spine deformities, knee deformities, limb length discrepancy and impaired voluntary control were excluded.

Total height of a subject from the plinth to the head end was measured using the height measuring scale with off shoes and straight stature (Figure 2). Then the navel height from plinth to umbilicus was also measured (Figure 3). The data collected was tabulated and statistically analyzed.

Results

The data collected was tabulated and the total height divided by the navel height was calculated. The ratio obtained was 1.621 which is close to 1.618…. which is known as the golden ratio.

Graph 1 depicts the recorded measurements and the total height divided by the navel height was calculated. The ratio obtained was 1.621 which is close to 1.618…. which is known as the golden ratio, golden proportion or divine proportion.

Discussion

In the material body, there are instances of the Fibonacci alphabetic character (φ) though it’s not been widely mentioned. In 1973, Dr. William Littler proposed that ratio of the lengths of the phalanges, and that the flexor and extensor movement of the primary fingers approximate the golden spiral. In 1998, Gupta et al., confirmed that the motion of the phalanges do approximate the pattern of the golden spiral, excluding for the fifth digit owing to abduction of the digit during extension.

Through empirical proof obtained through picture taking analysis of the hands of 197 people, Hamilton and Dunsmuir in 2002 ended that the ratios between the phalange lengths of the digits do not approximate the golden quantitative relation worth of (φ) 1.618. However, Hutchison and Hutchison (2010) showed that the info collected by Hamilton et al. (2002) overlooked the relationship that Littler actually proposed. Hamilton and Dunsmuir (2010) confirmed that the os length quantitative relation knowledge obtained from their subjects compared to people who were virtually at random listed by Littler in 1973, were in fact comparable and approximated the Fibonacci value of (φ) of 1.618.

Ashrafian and Atasioun noted that the number of branches from vessels in the heart follows the Fibonacci sequences. In 2013, Yetkin et al. showed that the golden ratio of Phi (φ) 1.618, exists within the cardiac cycle of the human heart beat. In 1991, Perez proposed that the DNA gene-coding region sequences were strongly related to the Golden Ratio and Fibonacci/Lucas integer numbers.
The rule of golden proportions has been planned in a shot to outline anatomical beauty. It is commonly accepted that facial beauty is correlates with anatomical symmetry. One of the most options of the face is that the mouth and teeth. Thus, professionals inside the sphere of medicine have tried to quantitatively characterize the parameters of an aesthetically appealing smile. In 1973, Lombardi was the first to officially propose the existence of having proportionate teeth, but dismissed the idea of using the rule of golden proportions to create aesthetic teeth. In 1978, Levin was the primary to watch that: 1) the breadth of the jaw central tooth is in golden proportion to the breadth of the lateral tooth. 2) The width of the maxillary lateral incisor is in golden proportion to the width of the canine. Further analysis into the connection between the golden proportion, dental arrangement, and an aesthetic smile was developed by Rickets in 1982. He implemented the use of the golden proportions in the treatment of patients. While Levin’s observation of the golden ratio existing in dentition is undeniable, its application to developing an aesthetically appealing smile has recently been questioned and often dismissed. In 2007, Dio et al. attempted to empirically define the basis for determining/judging beauty.

The existence of the golden quantitative relation continues to be discovered in many completely different instances of the human anatomy, attempting to use its proportions as a measure of beauty is not something that should be standardized. It is influenced by different factors including cultural influences. The diversity of biology in its essence is what constitutes its beauty, whereas the observations of the golden proportion in nature highlights study style, proportions, and symmetry.

**Conclusion**

In the exploration of the origins of life through arithmetic, the incidence of the Golden magnitude relation, Fibonacci Series and the underlying screenwriter series are discovered in many aspects of life on planet earth and within the cosmos. Although wide known in non-biological fields like design and art, it’s not been well explored within the human biology. Recent work has begun to explore the understanding of such development documented at many completely different scales and systems within the human anatomy and physiology starting from medical science, dentistry, the spiral of the human ear, the circulatory system and the human order. The observance of such ostensibly universal idea begs the question of the origin of life; but, a lot of analysis must be performed to explore its physiological role in biology. While some could dispute the importance of the Golden magnitude relation, it’s apparent that through our history there has been a fascination with it. Many can speculate on the validity of it in nature, additionally as in our history. It’s necessary to comprehend that, whereas a number of these examples mentioned are in reality more or less good to Golden magnitude relation, there still could be significance to the approximate price. Understanding its practical role could also be a keystone to creating quantum advances in many fields like computer science, medicine engineering styles, and human regeneration, amongst others.

**Ethical Clearance** - Taken from the Institutional Ethical committee

**Source of Funding** - Self

**Conflict of Interest** - Nil

**References**


Evaluation of Medication Adherence Level of Cardiovascular Disease Related Patients

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¹Research Scholar, Amity Institute of Pharmacy, Amity University, Noida (UP), ²Assistant Professor, Amity Business School, Amity University, Noida (UP), ³Director, Future Institute of Pharmacy, Bareilly (UP)

Abstract

The chronic diseases, these days have taken its place in the society with high mortality rate and the category of cardiovascular diseases has its key role. The major cause for higher mortality rate is non-adherence. The cross-sectional study was done for 3 months in various hospitals, clinics and societies in Delhi-NCR. A total of 334 patients were assessed by conducting an interview using structured questionnaire. The patient adherence level was analysed by using Morisky Medication Adherence Scale (MMAS). The study was compared among males (n=187) and females (n=147) category of patients where the adherence levels for male were 14.4%, 47% and 38.5% for high, medium and low adherence respectively and for females the levels were 14.2%, 44.8% and 40.8% for high, medium and low adherence respectively. The other factors were also studied by calculating their descriptive statistics. In conclusion, the study revealed medium adherence level among the participants and efforts are needed by healthcare professionals as well as patients so as to realize the full benefits of provided therapies or treatment or medication.

Keywords- MMAS-8, mortality rate, adherence, structured questionnaire, cardiovascular diseases.

Introduction

The Indian Pharmaceutical scenario has been totally changed these days. As the times passes, the chronic diseases has taken its place at higher side that also affected the mortality rate. Talking about the cardiovascular related diseases, the death rate in developed countries such as US has decreased but in case of India the rate has increased by 34% in between 1990-2016 and in US it has declined by 41%¹. In the report by WHO i.e. World Health Organization in 2018, it has been estimated that till year 2030, the rate will increase and also about 23.6 million people will die due to cardiovascular disease [²]. The cardiovascular diseases are therefore the foremost cause of mortality rate all over the world.

It has been very well said that the chronic diseases can only be cured if the patient adhere to the medications and treatments provided by the healthcare professionals. The term adherence is basically defined as the degree of level at which the patients follow up their medical instructions given by the physician or doctors [³]. For the betterment in the disease and timely procurement, it is very essential for the patients to take their medications properly without affecting the lifestyle and also to agree the recommendations given by healthcare professional. The major 3 steps that includes in adherence are-start-up of the treatment, implementation of the given treatment and at last the discontinuation of therapy [⁴]. The adherence rate is at low level in chronic kind of diseases in comparison with acute diseases [⁵]. The major factors that are responsible for poor patient adherence are demographic factors, dosage form of drugs, cost of medications, number of medications, attitude of patient towards medications etc. [⁶]. The proper level of medication adherence has its own importance for the wellness of the patients at every extent.

The key role of physicians or doctors or pharmacist or any other healthcare professional may help the patients...
towards better adherence. They can be connected with the help of internet facilities currently. The physicians or doctors also at the same time agree about the positivity of using internet more actively in their practices but are somewhat worry that if patients indulge themselves on internet for the information or other activities then they may not consult them for their problems face-to-face \(^7\). Instead of this internet proved it to be the best source for information and interaction with doctors and patients. Internet enhances the doctor-patient interaction in many ways and are as follows \(^8\). 

Firstly, the patients enjoy communicating with doctors or health experts.

Secondly, it appears to be the more convenient way to research online, online appointments and other services provided by the authorities at any time.

Thirdly, it offers the ability to consult international or national experts in particular field in easy manner.

In simple manner, internet is like a catalyst and promoter in enhancing and facilitating the role of doctors and patients in appropriate manner. According to the report by Microsoft, nearly 9 out of 10 respondents reported at least instance where the web search for symptoms of medical conditions, treatments and diagnostics for acute and chronic illness \(^9\). It is very important for the healthcare professionals as well as the patients to fill the gap in between communication so as to cure the diseases in better way.

The non-adherence towards the medications and treatment can be due to many reasons such as incorrect doses, slow or delay treatment and not following the given instructions by the healthcare professional. In one of the research, the non-adherence is said to be multi factorial \(^5\) as there are many reasons due to which the patients don’t take their medications properly and some of the reasons are as follows-

- Psychological reasons
- Missed the upcoming appointments with physicians
- Intricacy of the treatment provided
- Cost of the medication is not affordable
- Patient and provider relationship is badly chosen
- Lack of belief in the benefit of the treatment
- Side-effects from the treatment taken
- Insufficient follow up by the healthcare provider

It is thus the major concern among the Indian pharmaceutical market to enhance the level of patient adherence for improved and enhanced treatment of respective chronic illness.

**Objectives**

- To analyse the conditions that affect the patient adherence.
- To analyse patient adherence level by Morisky Medication Adherence Scale.
- To fill the gap between patients and healthcare providers.

**Materials and Method**

**Patients and study design**

The cross-sectional study was done on cardiovascular disease related patients. A total number of 334 patients were taken from various hospitals of Delhi-NCR. The data was collected from July 2018 to September 2018. The patients included were from the category of various cardiovascular diseases such as- coronary heart disease (heart attacks), cerebrovascular disease, raised blood pressure (hypertension), peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure.

**Data collection**

The data was collected on the basis of eight item Morisky Medication Adherence Questionnaire that is the standard and widely used scale. The patients responded yes or no to the questions asked as shown in table 1. The scores were given further on the basis of data collected. The patients ranging for scale more than 2 were low adherent, 1 or 2 were considered medium adherent and 0 were considered as high adherent.
Table 1- Showing Statements of MMAS

<table>
<thead>
<tr>
<th>S.no</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you sometimes forget to take your medicine?</td>
</tr>
<tr>
<td>2</td>
<td>People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your medicine?</td>
</tr>
<tr>
<td>3</td>
<td>Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?</td>
</tr>
<tr>
<td>4</td>
<td>When you travel or leave home, do you sometimes forget to bring along your medicine?</td>
</tr>
<tr>
<td>5</td>
<td>Did you take all your medicines yesterday?</td>
</tr>
<tr>
<td>6</td>
<td>When you feel like your symptoms are under control, do you sometimes stop taking your medicine?</td>
</tr>
<tr>
<td>7</td>
<td>Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?</td>
</tr>
<tr>
<td>8</td>
<td>How often do you have difficulty remembering to take all your medicine?</td>
</tr>
</tbody>
</table>

The questionnaire also had few general questions regarding demographic studies and also related to their disease. The descriptive statistics test using SPSS version 16 was used to find out demographic studies and various other analysis.

Result and Discussion

The total of 334 patients were analysed in the study and out of which 147 were females and 187 were males. The patients that were not interested to fill the questionnaire were skipped and interested patients were selected.

Item selection-

The study was categorised on the basis of demographic factors and MMAS-8 in which 8 questions were asked on their medications taken and to know overall adherence level towards medications and treatment. The statements were designed accordingly so as to know the adherence level of patients towards medications or treatment in better way.

MMAQ’s score for male and female-

In case of male and female patients, the majority of them were medium adherent towards the medications and treatment i.e. 88 (47.7%) and 66 (44.8%) in number respectively. Comparatively, both types of participants have equal score for the adherence level. The table-2 shows the comparative score of adherence level.

Table 2- Showing Adherence Level Score of Male and Female Participants

<table>
<thead>
<tr>
<th>Type of patients</th>
<th>High adherence level (0 score)</th>
<th>Medium adherence level (1-2 score)</th>
<th>Low adherence level (3-8 score)</th>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>27 (14.4%)</td>
<td>88 (47.8%)</td>
<td>72 (38.5%)</td>
<td>187</td>
</tr>
<tr>
<td>Female</td>
<td>21 (14.2%)</td>
<td>66 (44.8%)</td>
<td>60 (40.8%)</td>
<td>147</td>
</tr>
</tbody>
</table>

Pre-testing of the questionnaire-

The pre-testing of the questionnaire was done by selecting about 45 patients randomly and they were asked for giving marks on language and clarity of the questionnaire. On the basis of the suggestions, the changes were done.

Reliability of the survey-

The reliability of the questionnaire was checked
with the help of Cronbach’s alpha and the value was 0.70 which has been mentioned in the table 3. The value showed the good reliability of the statements.

### Table 3- Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.704</td>
<td>28</td>
</tr>
</tbody>
</table>

### Study on factors-

There were various factors which were included in the study to analyse the reasons that usually affects the patient adherence level. For the study, the descriptive statistics was done by calculating the mean and standard deviation of individual factors which has been mentioned in the table-4. The factors were marked on the basis of 5-point likert scale and examined the level of agreement of the patients.

### Table 4- Descriptive Statistics of Factors

<table>
<thead>
<tr>
<th>S.no.</th>
<th>Factors</th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge of disease</td>
<td>334</td>
<td>3.2096</td>
<td>1.18971</td>
</tr>
<tr>
<td>2</td>
<td>Awareness of therapies and medications</td>
<td>334</td>
<td>3.1347</td>
<td>1.09728</td>
</tr>
<tr>
<td>3</td>
<td>Addiction towards smoking, tobacco and alcohol</td>
<td>334</td>
<td>3.4251</td>
<td>2.95899</td>
</tr>
<tr>
<td>4</td>
<td>Difficulty with time</td>
<td>334</td>
<td>2.9790</td>
<td>1.06663</td>
</tr>
<tr>
<td>5</td>
<td>Unsatisfactory treatment given by doctor</td>
<td>334</td>
<td>2.8683</td>
<td>1.15236</td>
</tr>
<tr>
<td>6</td>
<td>Unpleasant side-effects of medications</td>
<td>334</td>
<td>2.8922</td>
<td>1.08239</td>
</tr>
<tr>
<td>7</td>
<td>Treatment requires interference with lifestyle</td>
<td>334</td>
<td>3.1407</td>
<td>1.12821</td>
</tr>
<tr>
<td>8</td>
<td>Skipping medications causes serious condition</td>
<td>334</td>
<td>2.9341</td>
<td>1.07288</td>
</tr>
<tr>
<td>9</td>
<td>Good relationship with healthcare provider</td>
<td>334</td>
<td>2.9671</td>
<td>1.10461</td>
</tr>
<tr>
<td>10</td>
<td>Awareness towards treatment helps to stick</td>
<td>334</td>
<td>3.1826</td>
<td>1.12821</td>
</tr>
<tr>
<td>11</td>
<td>Satisfied with communication skills of healthcare provider</td>
<td>334</td>
<td>3.0898</td>
<td>1.12828</td>
</tr>
<tr>
<td>12</td>
<td>Not satisfied with long waiting times</td>
<td>334</td>
<td>3.0689</td>
<td>1.14611</td>
</tr>
<tr>
<td>13</td>
<td>Doctor shows personal concern</td>
<td>334</td>
<td>3.0958</td>
<td>1.02950</td>
</tr>
<tr>
<td>14</td>
<td>Satisfactory cost of medications</td>
<td>334</td>
<td>2.9491</td>
<td>1.08239</td>
</tr>
<tr>
<td>15</td>
<td>Family members support during visits</td>
<td>334</td>
<td>3.1796</td>
<td>1.15629</td>
</tr>
<tr>
<td>16</td>
<td>Pay by family</td>
<td>334</td>
<td>3.0030</td>
<td>1.12706</td>
</tr>
<tr>
<td>17</td>
<td>Language barrier of doctors or pharmacists</td>
<td>334</td>
<td>3.0210</td>
<td>1.18151</td>
</tr>
<tr>
<td>18</td>
<td>Awareness of medical insurance</td>
<td>334</td>
<td>3.1407</td>
<td>1.13422</td>
</tr>
<tr>
<td>19</td>
<td>Carelessness due to hectic schedules</td>
<td>334</td>
<td>3.1048</td>
<td>1.20974</td>
</tr>
<tr>
<td>20</td>
<td>Cultural belief hindrance</td>
<td>334</td>
<td>3.0719</td>
<td>1.18838</td>
</tr>
</tbody>
</table>

The descriptive statistics of the factors resulted in various analysis towards the patient adherence level for betterment in treatment and medication process. It has been recommended that the factors such as knowledge of disease, awareness of therapies and medications, addiction towards smoking, tobacco and alcohol had affected the patient adherence level in more improved approach. Also, the factor that was involved in the study was the overall relationship with healthcare providers as they occupy indispensable role in improving patient health by providing time-to-time awareness, showing personal concern, positive feedback etc. empowers the patients to participate in taking care of themselves in smarter way. The other factors that proved to be the poor cause of adherence level is the cost of medications and treatment, unpleasant side effects, skipping of medications without doctor’s concern, lifestyle interference, poor time management and cultural beliefs.

Thus, it is important for the healthcare providers to have a good relationship with their patients and also to build trust for effectiveness and improvements in patient’s health.
It is has been studied that the participants taken in the study were medium adherent towards the medications and treatments that were provided by the doctors or physicians. The poor adherence level directly or indirectly affects the health of the patients with the negative outcome in all ways. The study revealed that the poor adherence level differs on gender and other demographic factors. The data compilation was done with the help of Morisky Medication Adherence Score that summarised various limiting factors for poor adherence level.

The factors such as cost of medications, addiction of tobacco or smoking or alcohol, communication with the doctors, long waiting times, awareness towards medications and diseases, support of the family, monotonous life schedule etc. affected the poor adherence level at present time among the patients. It is the major role of the patients to monitor their diseases timely and this can be done by internet and online services. The patients must follow the interventions that are designed by the healthcare providers to get themselves updated in all better ways.

Also, it is the key role of all type of healthcare providers to help their patients in improving the adherence towards their treatment. It is the duty of the pharmaceutical companies to improve the profitability of patient-doctor relationship through various campaigns and programs. The difference in the relationship can be improved by the technology that summarizes the pharmaceutical market in healthier and enhanced way.

**Conclusion**

The study identifies that now-a-days patients are not more adherent towards their medications and treatment due to large number of factors. The inappropriate behaviour towards non-adherence causes patients to have long and sometimes serious illness. The results from MMAS-8 also showed that majority of the patients are low adherent towards their treatment. The major objective of the research was to analyse the factors that affect patient adherence level towards medication and treatment and some of the factors were like- monotonous life schedule, long waiting times in hospitals, irregular visits to doctors, severe symptoms during medications, interaction with healthcare professionals, family support, forgetfulness, high cost of medications and treatment etc.

On the support of improving patient adherence level, there are various factors that may help patients to stick towards medications such as- regular patient counselling, various campaigns by the hospitals or clinics, digital reminders for the patients provided by the medical healthcare professional and family support. Thus, it is very essential for the patients to stick to the treatment and medications for better improvement of the health.

**Ethical Clearance**- For this study there was no requirement for ethical clearance certificate as there was no treatment given to the patients to analyse the results.

**Source of Funding**- The Source Of Funding Was Self.

**Conflict of Interest**- Nil

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Evaluating Nurses’ Perspective towards Service Quality and Patient Satisfaction in Private Hospitals: An Empirical Study in Yemen

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Abstract

Nurses have a direct association with all activities of the health care in hospitals, such as pain management, assisting surgeries, patient care and the business side of health services. They represent a major group in the delivery of service. Several studies have been found in literature measuring the perspective of nurses concerning service quality and satisfaction of patients in different contexts but no studies were found in Yemen. The aim of the current research is to examine the perspective of nurses concerning service quality and satisfaction of patients in Yemeni private hospitals. To achieve this aim, a reliable and valid Arabic version of the SERVQUAL scale was applied for gathering the required data from 250 nurses. The data were analyzed by using proper statistical methods such as confirmatory factor analysis (CFA) and structural equation modeling (SEM). The study shows that Yemeni private hospitals deliver a good quality service. The findings of the SEM prove that all quality dimensions of service, except physical environment and quality of staff it well in predicting patient satisfaction. The study’s results could be used by private hospitals in Yemen for developing quality of staff and physical environment improvement strategies.

Keywords: SERVQUAL, Nurses, Perception, Service Quality, Patient Satisfaction.

Introduction

Providing high quality services has become the main objective of businesses to promote the competitive advantage and ensure success. Improving the quality of the product and service is a major issue that influences consumers’ satisfaction, loyalty, word-of-mouth and behavioral intentions thereby, that will effects on the success of businesses. In the competitive environment of healthcare, realizing and understanding the perspective of customers and providers concerning quality of service can assist in delivering better quality.

In healthcare sector, nurses have direct-relationship with patients and providers and they contribute to all parts of the hospital services. Hence, their perspective is crucial for improving the quality of services and satisfaction of patients.

Dimensions and Measurement of Health Care Service Quality

Quality was defined as “the capability of a product or service to satisfy clients’ needs”. “The quality of health care is capability of services to meet patients’ needs efficiently, effectively, and affordable.”

Parasuraman have finalized five factors: tangible, empathy, responsiveness, reliability, and assurance as service quality dimensions. These dimensions were applied by several researchers in different contexts of healthcare to evaluate service quality. The World Health Organization suggested six dimensions: effectiveness, efficiency, equitability, accessibility, safety and acceptance for developing the health care service quality. In the present research, the quality dimensions of service are representing through physical environment, staff quality, trust, administrative procedures, and clinical care process.

Parasuraman’s SERVQUAL scale is extensively acceptable scale in evaluating service quality from the
perspective of customers and providers, and has been used by many researchers in healthcare\(^1\), \(^1\)7, \(^1\)8, \(^1\)9. It was found that all dimensions except responsiveness strongly influence patient satisfaction\(^1\)2, \(^1\)4, \(^1\)5, \(^1\)20.

The investigation of nurses’ perspective towards service quality and patients’ satisfaction is vital to improve and develop strategies of delivering process. It also, creates good impression in nurses and leads to an engagement of nurses in delivering high quality care services\(^2\)1. Proper communication between nurse and patient helps in enhancing patients’ satisfaction\(^2\)2.

**Research hypotheses.**

**H1a**: Satisfaction of patients significantly and positively influenced by the physical environment.

**H1b**: Satisfaction of patients significantly and positively influenced by staff quality.

**H1c**: Satisfaction of patients significantly and positively influenced by the clinical care process.

**H1d**: Satisfaction of patients significantly and positively influenced by administrative procedures.

**H1e**: Satisfaction of patients significantly and positively influenced by trust.

**Research methodology**

The research was carried out on 250 nurses who work in private hospitals in IBB city, Yemen, a convenience sampling method was employed in this research. An Arabic version of SERVQUAL instrument with thirty items were validated and applied in this research. The collected data has been processed and analyzed to assess the perspective of nurses toward the quality and satisfaction in Yemeni private healthcare. Analysis of data and test hypotheses was done by applying SPSS version (20.0). CFA and Cronbach’s Alpha techniques were applied to examine the reliability and validity of the questionnaire. Frequency and percentage statistics were applied to interpret nurses’ demographic characteristics and SEM was used to test hypotheses and evaluate the influence of service quality dimensions on the patients’ satisfaction.

**Results and Discussion**

This section is dealing with discussion of outcomes of analysis, such as descriptive, reliability, CFA and SEM.

**Profile of Participants**

Table 1 is described Nurses’ demographic characteristics. It signifies that about 50.8% of nurses were male and 49.2% are females. About 66.8% of the participants were aged in a group of 19-29 years, followed by group age of 30-39 years 31.6 %. The group age of 40 years and above has the lowest number of the respondents 14.3%.

**Table 1 Profile of Participants**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>127</td>
<td>50.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>123</td>
<td>49.2</td>
</tr>
<tr>
<td>Age</td>
<td>19-29</td>
<td>167</td>
<td>66.8</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>79</td>
<td>31.6</td>
</tr>
<tr>
<td></td>
<td>40 above</td>
<td>4</td>
<td>1.6</td>
</tr>
<tr>
<td>Education level</td>
<td>High school</td>
<td>7</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>210</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>33</td>
<td>13.2</td>
</tr>
<tr>
<td>Experience in Years</td>
<td>Less than one</td>
<td>43</td>
<td>17.2</td>
</tr>
<tr>
<td></td>
<td>1-5</td>
<td>150</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>More than 5</td>
<td>57</td>
<td>22.8</td>
</tr>
</tbody>
</table>

Categorizing nurses by their level of education, it is shown that around 84% nurses held a professional diploma, 13.2% nurses are graduates and 2.8% nurses studied up to high school. With respect to the experience, it is revealed that about 60% nurses have 1 to 5 years of work experience, 17.2% nurses have less than one year of work experience, and 22.8% of nurses have more than one 5 years of work experience.

**Test for the reliability and validity**

Table 2 is represents the results of reliability and validity of the current study which signifies that there is a good fitness of the model measurement since the values exceed the standard value of model fit; \(\chi^2/df = \)
1.472; Goodness of Fit Index (GFI) = 0.881; Adjusted Goodness of Fit Index (AGFI) = 0.849; Normed Fit Index (NFI) = 0.919; Incremental Fit Index (IFI) = 0.973; Comparative Fit Index (CFI) = 0.972; and Root Mean Square Error of Approximation (RMSEA) = 0.044. The findings of CFA test show that all items are significant at 0.001 level and correlated to their proposed variables. Therefore, the convergent validity criterion has been confirmed in this research.

Table 2: Model and measurement

<table>
<thead>
<tr>
<th>Construct</th>
<th>FL</th>
<th>AVE</th>
<th>CR</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE1</td>
<td>0.674</td>
<td>0.508</td>
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<tr>
<td>PE2</td>
<td>0.676</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE3</td>
<td>0.766</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE4</td>
<td>0.726</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>PE5</td>
<td>0.716</td>
<td>0.829</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of Staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QS1</td>
<td>0.731</td>
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</tr>
<tr>
<td>QS2</td>
<td>0.683</td>
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<tr>
<td>QS3</td>
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<tr>
<td>QS4</td>
<td>0.728</td>
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<td></td>
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<tr>
<td>QS5</td>
<td>0.691</td>
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<td></td>
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<tr>
<td>QS6</td>
<td>0.73</td>
<td></td>
<td></td>
<td>0.872</td>
</tr>
<tr>
<td>Clinical Care Process</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CCP1</td>
<td>0.99</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CCP2</td>
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<td></td>
</tr>
<tr>
<td>CCP3</td>
<td>0.99</td>
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</tr>
<tr>
<td>CCP4</td>
<td>0.71</td>
<td></td>
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<tr>
<td>CCP5</td>
<td>0.996</td>
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<tr>
<td>CCP6</td>
<td>0.749</td>
<td></td>
<td></td>
<td>0.946</td>
</tr>
<tr>
<td>Administrative Procedures</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AP1</td>
<td>0.907</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AP2</td>
<td>0.553</td>
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<tr>
<td>AP3</td>
<td>0.999</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>AP4</td>
<td>0.605</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AP5</td>
<td>0.599</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AP6</td>
<td>0.976</td>
<td></td>
<td></td>
<td>0.920</td>
</tr>
<tr>
<td>Trust</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>0.812</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>0.714</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>0.633</td>
<td></td>
<td></td>
<td>0.787</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA1</td>
<td>0.653</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA2</td>
<td>0.807</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA3</td>
<td>0.842</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA4</td>
<td>0.562</td>
<td></td>
<td></td>
<td>0.792</td>
</tr>
</tbody>
</table>

Note: $\chi^2$/df = 1.472; GFI = 0.881; AGFI = 0.849; NFI = 0.919; IFI = 0.973; CFI = 0.972; and RMSEA = 0.044. FL=Factor Loading, AVE=Average variance extracted, CR= construct reliability, CA=Cronbach’s alpha
The standard value of the composite reliability (CR) is 0.60 and the measurement model has exceeded this value. Therefore, all the measurable items have been archived the condition of the construct reliability. It also, shows that all variable have greater than the standard value of Cronbach’s alpha (CA) value 0.70 signifying that there is a very good internal consistency in all variables of this study. Thus, it the reliability of the current questionnaire confirms. The average variance extracted (AVE) values of all variables are above the standard value of 0.50. Therefore, the current study achieved the requirements of convergent validity and reliability. Table 2 indicates that the loadings of factor (FL) of all items were above the standard value of 0.5 hence, all 30 items were used for (SEM) analysis.

**Discriminate Validity**

Table 3 indicates the correlation matrix to ascertain the discriminate validity of the proposed model. It indicates that all interrelationships have an association below 0.70. It also shows that all values are below the values of square roots of AVE for conforming variables.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Physical Environment</th>
<th>Quality of Staff</th>
<th>Clinical Care Processes</th>
<th>Administrative procedures</th>
<th>Trust</th>
<th>Patients’ Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Environment</td>
<td>0.713</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of Staff</td>
<td>0.192</td>
<td>0.727</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Care Processes</td>
<td>0.002</td>
<td>0.012</td>
<td>0.885</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative procedures</td>
<td>0.003</td>
<td>0.001</td>
<td>0.001</td>
<td>0.796</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.227</td>
<td>0.223</td>
<td>0.001</td>
<td>0.016</td>
<td>0.724</td>
<td></td>
</tr>
<tr>
<td>Patients’ Satisfaction</td>
<td>0.289</td>
<td>0.223</td>
<td>0.014</td>
<td>0.000</td>
<td>0.504</td>
<td>0.725</td>
</tr>
</tbody>
</table>

Note: A bold Numbers is denoting to square root of the average variance extracted (AVE) and the values under the diagonal denote to the correlation between variables.

**Structural equation model**

After conformed the reliability and validating of the proposed model, SEM method was carried out in AMOS version (20.0) to examine hypotheses and determine the structural fitness of the model.

![Figure 1 – SEM Model based on Standardized Coefficient of the Effect of Service Quality on Satisfaction of Patients.](image)

Figure 1 is a graphical representation (along with regression weights) of the association between quality dimensions of service and satisfaction of patients. The diagram of SEM is resulting from the direct relationship between the study’s variables. It also shows the correlation value of dimensions and their corresponding regression weights.

Table 5 Specifies the unstandardized coefficient (β) values of physical environment (β= -0.049, p > 0.005) and quality of staff (β= -0.043, p > 0.005) indicating that they have not significantly effect on patient satisfaction. β values of clinical care process (β= 0.169, p < 0.001), administrative procedures (β= 0.127, p < 0.001) and trust (β = 0.339, p < 0.001) specifying that it has significantly contributed to satisfaction of patients.
### Table 5 Hypothesis in the Structural Equation Model

<table>
<thead>
<tr>
<th>No</th>
<th>Hypothesis</th>
<th>β</th>
<th>S.E of Beta</th>
<th>Standardized Path Coefficient (Beta)</th>
<th>T value</th>
<th>P value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2a</td>
<td>Physical Environment → Satisfaction</td>
<td>-0.049</td>
<td>0.031</td>
<td>-0.075</td>
<td>-1.552</td>
<td>&gt;0.005</td>
<td>Not Conformed</td>
</tr>
<tr>
<td>H2b</td>
<td>Quality of Staff → Satisfaction</td>
<td>-0.043</td>
<td>0.029</td>
<td>-0.073</td>
<td>-1.504</td>
<td>&gt;0.005</td>
<td>Not Conformed</td>
</tr>
<tr>
<td>H2c</td>
<td>Clinical Care Process → Satisfaction</td>
<td>0.169</td>
<td>0.04</td>
<td>0.243</td>
<td>4.216</td>
<td>&lt;0.001**</td>
<td>Conformed</td>
</tr>
<tr>
<td>H2d</td>
<td>Administrative Procedures → Satisfaction</td>
<td>0.127</td>
<td>0.031</td>
<td>0.233</td>
<td>4.066</td>
<td>&lt;0.001**</td>
<td>Conformed</td>
</tr>
<tr>
<td>H2e</td>
<td>Trust → Satisfaction</td>
<td>0.339</td>
<td>0.06</td>
<td>0.319</td>
<td>5.614</td>
<td>&lt;0.001**</td>
<td>Conformed</td>
</tr>
</tbody>
</table>

Note: ** indicate to significant at 1% level

According to the results of SEM, physical environment and quality of staff have not significantly influence on satisfaction of patients, therefore; hypotheses H2a and H2b are not approved. Since the clinical care process, administrative procedures and trust have a significant influence on patients’ satisfaction, therefore, supporting hypotheses H2c, H2d, and H2e. Based on the standardized path coefficient dimension of trust has the height contributing on patients’ satisfaction followed by the clinical care process and the lowest contributing of quality of service on patients’ satisfaction was found in the dimension of physical environment. P-value =0.27 is above 0.05 which specify that the model is perfect in fit. The calculate value of Chi square in this research is 4.051 with degree of freedom χ²/df 1.350 which is less than standard value (≤ 5.00) P-value 0.256 which is greater than 0.05. The value of GFI in this study is 0.995, AGFI value in this research is 0.963, and values of NFI and CFI are 0.985 and 0.996 respectively which also greater than the standard value 0.90. RMSEA value of the current study is 0.038 which is less than the standard value 0.08. Since all findings of SEM model (P-value, χ²/df, GFI, AGFI, CFI and RMSEA values) of this research are exceeding the standard values of model fitness. Hence the model is perfectly fit.

**Discussion**

The dimensions of the physical environment and staff quality have not been significant effect on patient satisfaction. By contrast, earlier researches that focus on the significance of the staff-quality to ensure patients’ satisfaction is supported by previous studies that confirmed that the satisfaction of patients significantly affected by the personnel-quality. The quality of nurses and doctors’ communication is yet another important dimension to patients. Hence the owners and managers of Yemeni private hospitals need to focus more on factors such as adopting new technology and modern equipment, provide proper training to their staff to deliver a good service and ensure the satisfaction of patients.

It also, found that patients’ satisfaction is significantly affected by trust. The clinical care process reflected as an influential aspect in the quality of healthcare services through its importance impacts on the satisfaction of patients. This result is confirmed by many studies who reported that patient satisfaction is significantly affected by quality of clinical care processes. Administrative procedures also have a vital role in the satisfaction of patients. Many researchers have revealed that administrative procedure has positively effected on the satisfaction of patients. According to the nurses the dimension of trust has the highest effect on patients’ satisfaction and the lowest effect was found in the factor of physical environment.
Conclusion

The current research was aimed to examine the perspective of nurses concerning the quality dimensions of healthcare service and its influence on the satisfaction of patients in Yemeni private hospitals in Ibb city. The findings show that the independent dimensions except physical environment and quality of staff have a good predictive power and efficiency in describing the relations between the satisfaction of patients and healthcare quality from the viewpoint of nurses. It also confirms that the trust has the highest effect on the satisfaction of patients, and physical environment have lowest impact. So, the study suggests that improving the physical environment and quality of staff dimensions will result in increasing the level of satisfaction. The current study was carried out a quantitative method and focused only on the perspectives of nurses employed in private hospitals at Ibb. Further studies can be carried out qualitative approaches in the other Yemeni cities and public hospitals to study the perspectives of other stakeholders and gain better understanding of patients’ satisfaction and quality of service in the Yemeni healthcare industry.

Ethical Clearance: Not applicable

Source of Funding: Self

Conflict of Interest: Nil.

References


Escape from Reality: An Analysis of Corporate Culture and Quest for Quasi-Relationships in the Virtual World

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Abstract

The world wars followed by Industrialization and subsequently by Globalization have restructured the livelihood of enormous people. Specifically, it has transformed the culture, lifestyle, family structure and traditions followed by the ancestors. This become as the significant reason that traditional joint family framework are dismantled and the Nuclear family perception has formed. People started to live in small groups and assemble together on particular occasions and other related family functions.

The fondness towards high standard of living and their race behind the materialistic desires up surged the culture of single parent and working parents. This destroyed the parent and child relationship. The loneliness set across the young minds leads them to anxiety triggered with depression.

Technology which is designated to soothe the depression caused by loneliness, as it progressive, in turn, it increased the crack between the relationships. People talk less to each other in reality but regularly post their views on social networks. This longing thirst for a virtual relationship made both their real and virtual world complex. This paper elucidates the impact of technology addictions and gaming affects physically and psychologically, the individuals and especially children i.e. the risk in virtual world relationships with reference to the text Ready Player one by Ernest Cline and Reamde by Neal Stephenson.

Keyword: MMORPG, Virtual Reality, corporate culture, Family Structure, globalization

Introduction

The Globalization took after by industrialization plays vital role in building the nation which got crushed during the world wars. The fast development needs more work forces to assemble a mighty nation. This in turn changed the mindset of the people and made them all to run behind the materialistic development. People started becoming more selfish, greedy in earning money and saving it for themselves. This affects the family setup which breaks the joint family framework and nuclear family setup has widely spread among everyone.

Throughout the human history, reproduction, socialization and building relationships with all the community have been the significant role of every human being. These specific qualities are rich in the joint family structure. But now Nuclear Family framework is moulded in which just parents and children live together. Money has begun to occupy the lives of the people. This makes both men and women to work in order to lead a luxurious life. They went to jobs leaving their children alone in the home. This forlornness and the absence of parental love and care at the budding age make a crevice in the Parent-Kid relationship.

Children and young adults who are prone to loneliness are engaged with latest technology. The innovative advancement in communication and entertainment reduces the depression and anxiety. The advance in technology helps in setting relationships in a virtual world and also helps them with a chance to discover an association with a virtual home far from real home. This social media connection makes a more confounded relationship which influences the individuals with more anxiety. One of the technology helps in diminishing loneliness is the games. Development of videogames has grown into an unimaginable extent which attracts people irrespective of all the ages.
Video games have gained much importance all over the world and Video game diversion effects have been researched and entrenched in both the positive and negative outcomes such as valuable effects of pro social games on helping, Constructive outcomes of activity games on visual-spatial skills and hurtful effects of quick paced games on subjective control. Video games are updated to various newer versions to attract people and satisfy them in a better way. One of such innovative advancement is RPG i.e. Role playing games in videogames. Firstly, only one player can take up a role and play inside the game. Later it extend its arm to many players i.e. MMORPG Massively multiplayer online role playing game.

**MMORPG**

MMORPG Massively multiplayer online role playing games is the most recent and advanced version of videogames which merges with the latest technology. Virtual reality is the heart of MMORPG, is a simulated environment similar to the real world generated by computer-user interface. It is an open world game play in which a new world is created inside the game where one can live their life happily because it has all the original components such as politics, economy, society etc. Also user can experience and explore different imaginative worlds.

In ready player one by Ernest Cline OASIS is the virtual world created by a billionaire James Halliday. The last will of Halliday is that one who unlock three secret gates and finds the Easter egg which is hidden inside can inherit his entire fortune and also gain absolute control over OASIS.

In Neal Stephenson’s Reamde T’Rain is the game i.e. virtual world created by Richard Forthrast to experience adventure and acquire crypto currency through gold farming.

**Game Addiction: Lack of interfamily bond between parents and children**

Nuclear family structure lacks the family values, tradition and culture because they miss the love, care and support of the old and experienced elders. This in turn makes them learn and experience each and every situation of the life by themselves. The prime part of their life is spent in experiencing to grow better.

Man is a social being. The first twenty years of his life is spent to develop himself as a whole, responsible and knowledgeable person in the society. After this stage the first and foremost social grouping is experienced in his family. In the joint family environment, both men and women from infancy to childhood, adolescence to adulthood grow physically, psychologically and socially. Happy, peaceful and comfortable life, to a men and women, on a greater extent relies in the quality of their family life. The individual has to come across the phases of growth from passive receptivity, dynamic independence and at last extreme rot. During all these stages, the family demonstrates different experiences which results in sculpting a man or woman with moral and virtuous ideas or making them grow against all the morals and virtues of the society.

Parents in the nuclear family structure leave children alone in home or with caretaker to go for their jobs. Generally women take the responsibilities of home and children but when women join the workforce it gets shaken. The question of taking up the responsibilities make them question, quarrel between each other and finally end up in getting separated. For survival, they still stick on to jobs leaving their children alone in home. People like baby sitter, care taker and technologies like baby monitoring are there, the love and care of the parents is lacking to the toddlers. On the other hand, when there is only one source of income i.e. only male in a family is earning, and then the economic dependence of the counterpart leads to the psychological depression. It also adversely affects the economic status also bothers the parent-kid relationship. When children grew up in such situations the bond between children and the parent becomes less and the technology replaces the parents. The social media and the games of the higher end like online highly addictive games attract and alienate people from the family to experience a new virtual world i.e. utopian or dystopian world.

The dystopian feature of ready player one by Ernest cline exhibits the disaster of the ruined world due to third world war in 2049. Proper family structure does not prevail in the society because of the world war. They have lost their home, family members, parents and children. This affected them psychologically and has created a great depression in their mind. Every individual in ready player one craves to escape the bitter reality, as one of the billionaire and the designer of the OASIS game announce that whoever finds three copper keys
and unlock the Easter egg can acquire all his fortunes. The protagonist “wade watts” lives in the container piled up home in the city of Oklahoma often travels in OASIS in search of hidden fortune. There he finds lot of friends who were also in search of the fortune. He find many new relationship and able to socialize with them in a better way than in reality. He feels more comfortable to express his feelings and lives a life to his wish there. Though the relationships in OASIS are filled with doubts and risks, he sees them only as avatars and not as real life characters. The advantage of OASIS is that they can take up any role or character to their wish and fulfil all their dreams to the best. This satisfies his psychological illness and fulfils his needs.

Ernest cline projects the people of all the ages are addicted towards the game in order to forget reality and live happy life. But even after coming back to the reality the impact created inside the virtual world follows them. This slowly makes them forget the reality. Physically and psychologically they have become very weak to live their normal life.

Reamde by Neal Stephenson depicts the addiction of people towards the games. Especially when the ransom ware attacked on T’Rain, an MMORPG game and created chaos, People started losing temper and chaos prevailed. The in-game money i.e. crypto currency is affected by the ransom ware which makes people to pay some valuable resources of the game in exchange for the encryption key to play the game. They are in the situation that they must lose all their worldly resources or die in virtual world which will also be threat to their real life. Thus, the need for the players to continue the game, risking their own life shows how people were addicted to the game.

**Virtual reality – the advent of science and technology over individual quest**

From the invention of Fire and the wheel to the Hyper loop and Mars colony, the innovation benefits in the evolution of human being. The innovation and invention in communication and lifestyle changed the phase of luxury to a basic need. The combination of technology in the smart devices jumped ahead in Human-Computer Interaction. Even though the positive effect of technology and the Internet in various studies is evident, there are numerous hurtful impacts exist. Regoniel explains that “a couple of the negative consequences of the Internet such as compulsion, damaging and inescapable pornography, the loss of human touch, criminal action, for example, phishing, misleading, Master card theft, and wholesale fraud, and the surrender of family” (Bakardjieva,47)

Internet is the best Teacher which teaches or gives information about anything that exists in the world. It also explores other addictive entertaining aspects such as social media and gaming. Virtual reality helps one in immersing oneself into another world hiding the reality. This gives lot of pleasure to everyone and makes them more addictive.

This is evident in Ernest cline’s Ready player one that to forget and accept the bitter pain of the reality. Everyone irrespective of all the ages begin to spend their time in virtual world. This affects their health severely because the radiation and vibrations are sent to human brain to make one accept the fake things for reality. This may also result in death.

**Information overload**

One of the primary dangerous consequences of the Internet is an ongoing wonder called information overload. Indeed, even before the origin of the Internet and the exponential development of information and technology, Herbert Simon prophetically says,

“In a world flourishing with information, the wealth of information implies a scarcity of something unique: a lack of whatever it is that information expands. What information expends is fairly self-evident: it devours the attention of its recipients” (Soper, 1)

According to Herbert Simon’s sayings information overload has become as the significant reason for all the problems. Unwanted, addictive information become as open source where anyone can learn about anything which spoil their mind and teach them all unwanted, immoral values which might damage their life.

This is evident in Neal Stephenson’s Reamde because of the exposure to the internet; everyone began to play the game T’Rain and lost all their private and confidential documents. Also they invested real money in virtual gold farming and converting it to crypto currency to become as a millionaire or billionaire. This greedy attitude towards money is initiated or induced
through the over usage of internet and the unwanted content comprehended in it.

**The misguided feeling of reality**

Sherry Turkle, in her book Alone Together expressively lights up

“Human connections are rich, and they are untidy, and they are requesting. Also, we tidy them up with innovative technology” (p. 32)³

According to Turkle’s sayings Virtual reality can only seem to be real but not real. One can feel like they are travelling or experiencing different world or environment but alienation follows them everywhere. Human being cannot easily accept the alien world as his own because he lost the real human touch, empathy etc.

In Ernest cline ready player one, the protagonist wade watts and his friend spend most of their time in OASIS searching the key. They get new relationships but are unable to express their true feelings, real time worries etc because of the insecurity. They are forced to hide their true emotion which affects them psychologically.

**The sense of forlornness**

Turkle concedes that technology is a substitute for associating with others up close and personal. She trusts that our organized lives prompt us escaping each other. As opposed to talking eye to eye or even on the telephone, texting is the favoured alternative. This can prompt confusing the sender’s or receiver’s aim.

In ready player one, their quest for inheriting a real fortune they exploit themselves and the OASIS in search of the key. Even though they have no clue about what it is or how does it look or how the people are chasing for it. In Reamde, a concept of gold farming is narrated. It is assumed to have originated from China or Korea where a set of computer geeks with all the tech gadgets they harvest in-game money or resources. This in-game money or resources helps the player to gain access, buy or upgrade themselves in the game. These gold diggers will give away in-game money in exchange for real-world money or cryptocurrencies. Characters in both the ready player one and Reamde have detached themselves from the real world to satisfy their longingness in the virtual world.

**Effects of Technological addiction in Familial relationships**

In today’s modern society roughly about 40 percent of the total populace is connected online at any instance. Besides this, the worldwide Internet practice has developed about 6 overlap throughout the past decades, with nearly 96 percent of Internet users in the country of Korea using rapid Internet associations in disparity with 78% in the United Kingdom, and 56% in the United States. Comparing the use of Internet access during 2000, the United States has dramatically increased its usage, although shrewd Internet use has increased generously towards the end of 2011, signifying that Internet utilization implementing various hardware devices has turned into an exceedingly powerful movement for the two adolescents and adults. (Young, 21)⁴

The MMORPG games like OASIS in Ready Player One and T’Rain in Reamde which is designed to be real-world exploration like theme named as open world game have missions/tasks which may extend to weeks or months to complete. Though there is an in-game purchase which gives away gadgets and powers to complete the mission but the players who were addicted never opt for that option. When the game is over instead of getting into the real world, they get mentally disturbed and look for the next mission or game and choose to be wholly detached from the real world.

**Conclusion**

Robots taking over Humanity will no longer be fictitious if there is still an increase in technological addiction. Humans need to socialize more and to contribute more towards community living. Humans tend to live in a community in the early civilizations which paved the way for innovations by understanding the needs. Since Humans have survived millions of years without the tools, using only the human mind, being their ultimate tool for survival. The relationship is to be real and not made up one like found in the social media. People must be aware and be cautious in dealing with both the virtual and real-world relationships, and never let them take over by technology.

**Ethical Clearance:** Non- Experimental

**Source of Funding:** Self

**Conflict of Interest:** Nil
Reference

3. Turkle S. Alone together: why we expect more from technology and less from each other. New York: Basic Books; 2017.
Patient’s Perception on Esthetic Restoration of Primary Anterior Teeth

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Abstract

Background and Aim: The present study aimed to assess the social and self-perceptions of children (4 to 8 years) regarding the esthetics of restored primary anterior teeth.

Materials and Method: A total of 135 children seeking dental treatment were asked questions about the dental restorations of primary anterior teeth after showing them pictures of restored carious lesions.

Results: They showed increased acceptability for Zirconia crowns as compared to other forms of restorations.

Conclusion: The children can perceive esthetics of their anterior restored teeth as early as 4 years of age which is important when planning esthetic restorations for them.

Key words: Esthetics; Primary teeth; Patient Perception

Introduction

Aesthetics is an integral component of dentistry. Lately, increasing awareness among the patients has attracted them towards contemporary aesthetic dental treatments which not only improves their appearance but also overall personality. Current esthetic science has standardized the body and facial esthetics whereby the individuals are judged based on their appearance and any deviation from normal is unacceptable, whether in an adult or a child. Although there is abundance of literature regarding esthetics of adults, esthetic perception in children has been rarely evaluated. According to Jean Piaget, “a child’s perception of self and appearance develops only by the age of 8 years.” Conversely, child psychology studies suggest that children are conscious of their body image from a very young age and differ in self-perception of body image when compared to parents.

Usually children with a normal dental appearance are considered more attractive and perceived to be socially and intellectually more competent and better adjusted psychologically. Therefore primary dentition esthetics is imperative which has led to the emergence of “pediatric aesthetic dentistry” that deals with the maintenance and enhancement of the beauty of the mouth of infants and children through adolescence, including those with special health care needs.

The early childhood caries (ECC), trauma or congenital malformations may adversely affect primary dentition aesthetics. They occur in about 30 to 90% of the children in developed nations. Their diagnosis, prevention and restoration is often a challenge owing to the small size of primary maxillary incisor teeth where retentive, esthetic and fracture resistant restorations are...
often difficult to provide\(^8\).

The ECC affects labial surface of maxillary anteriors in children \(\geq 5\) years of age, producing an unaesthetic appearance which may be treated with various restorations. The parental satisfaction for these restorations as well as their differences in opinions with the dentists has been evaluated earlier \(^9,10\). However, children’s aesthetic perception about their dental aesthetics has not been investigated\(^11\).

Untreated dental afflictions often cause psychological and social problems in children, producing a negative impact on their social relationships and personality and may continue throughout their life\(^12\). These social consequences of anterior dental esthetics have been rarely evaluated in children. Further, their perception on altered esthetics and its psychosocial and emotional consequences are seldom considered important\(^13\). Although emotional aspects are difficult to evaluate in a child, it is not impossible\(^14\).

Eventhough, recent advancements in anterior restorations have enabled complete esthetic rehabilitation of the primary anterior teeth, it is often difficult to give a satisfactory treatment to a child owing to the difference in view point of the patient, parent and the dentist\(^15\). It has been seen that the parents are more interested in preserving esthetically damaged anterior teeth rather than the replacement of extracted or missing teeth\(^16\). A proper parental education in this regard may be helpful in providing the best treatment to the children. Besides, a dentists experience in pediatric aesthetics is essential to enable parents to make right decisions for their children.

The children are highly concerned about the esthetics of primary anterior teeth as was revealed in a survey assessing social and self-perception of 431 children\(^14\). With this background the current study aimed to assess the social and self-perceptions of children (4 to 8 years) regarding the esthetics of restored primary anterior teeth.

**Materials and Method**

This cross-sectional study was approved by the Ethics Committee of Kasturba Hospital, Manipal, Karnataka, India (IEC 826/2016). A written informed consent was obtained from the parents/legal guardians of the participants for participation in the study. The study included a questionnaire and photographs of previously treated subjects to determine the perceptions of the children regarding the aesthetic restorations of primary anterior teeth. It enabled the dentist to recognize a child’s perception of his/her primary anterior teeth esthetics and their opinion regarding the best restoration. The questionnaire was prepared in both English and local language. The demographic characteristics and closed end responses to the questions were recorded after showing the pictures of carious lesions and aesthetic restorations viz glass ionomer restorations (GIC), polycarbonate crowns, composite restorations and zirconia crowns to each participant. The purpose of the study was explained to them by a single examiner to rule out bias.

The inclusion criteria was co-operative children of 4 to 8 years of age with ability to comprehend and understand simple questions of the questionnaire (Table1). The exclusion criteria was children outside the age range of 4 to 8 years and those with special care needs or medically compromised patients.

The included children were subdivided into 3 groups based on their age as:

- Group A: 4 to 5 years
- Group B: 5.1 to 7 years
- Group C: 7.1 to 8 years

About 200 children who fulfilled the inclusion criteria filled the questionnaire (Psychological Impact of Dental Esthetics Questionnaire). A modified form of questionnaire which was validated in an earlier study was utilized\(^17\). The children saw the photographs of primary anterior teeth before and after dental restorations/rehabilitation and rated their perception using closed ended questions i.e. they marked the response as either “yes” or “No”. This helped in assessing their satisfaction with the appearance and color of anterior teeth.

**Statistical evaluation:**

Statistical analyses was done with the help of the Statistical Package for the Social Sciences software (SPSS) version 20. The data was analyzed using Chi square test. The statistical significance was set at \(p < 0.05\) and results were considered significant if \(p < 0.05\).

**Results**

Out of 200 children, only 135 children completed the questionnaire. Among them, 70 (51.8 %) were males
and 65 (48.14%) were females. About 31.85% were in the group A (n=43); 45.18% in group B (n=61) and 22.9% in group C (n=31).

The subjects were questioned about their dental appearance specifically in relation to tooth color, preference towards friend’s teeth, their hesitation to look into mirror due to deformities of teeth. It was found that 65.9% (n=89) of the children were not happy with the appearance of their teeth, 68.14% of them were dissatisfied with the color of their teeth, 78.5% (n=106) expressed a desire for better looking teeth, 70.3% (n=95) often looked at their teeth in the mirror, 56.29% (n=76) had hesitation in smiling due to their teeth, 71.11% felt that their friend’s teeth were better looking, 71.1% (n=96) desired to undergo treatment to improve the appearance of their teeth while 54.8% of the children did not like the appearance of unrestored teeth that were shown to them in a picture. The most preferred type of restorations were Zirconia crowns. These were followed by composite restorations (25.9%) and polycarbonate crowns (0.06%) and GIC (0.01%).

An intergroup analysis showed that there was no significant difference in the opinion of the children as well as their preference for a restoration (p>0.05) (tables 1 and 2). Furthermore, there was no gender difference in the opinions, although the percentage of females regarding positive esthetic perceptions was more (table 3).

### Table 1: Response of the participants to various questions based on age

<table>
<thead>
<tr>
<th>Questions asked</th>
<th>Group</th>
<th>Response</th>
<th>Chi square test p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you satisfied with the appearance of teeth?</td>
<td>A (4-5 years)</td>
<td>11</td>
<td>0.339 ; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Are you satisfied with the color of your teeth?</td>
<td>A (4-5 years)</td>
<td>15</td>
<td>0.886; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Do you wish to have better looking teeth</td>
<td>A (4-5 years)</td>
<td>31</td>
<td>0.457; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Do you frequently look at your teeth in the mirror?</td>
<td>A (4-5 years)</td>
<td>31</td>
<td>0.752; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Are you hesitant in smiling?</td>
<td>A (4-5 years)</td>
<td>27</td>
<td>0.369; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Do you think your friend’s teeth are better?</td>
<td>A (4-5 years)</td>
<td>31</td>
<td>0.718; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Do you want to undergo treatment for good looking teeth?</td>
<td>A (4-5 years)</td>
<td>30</td>
<td>0.693; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Do you like the teeth in photo?</td>
<td>A (4-5 years)</td>
<td>20</td>
<td>0.867; NS</td>
</tr>
<tr>
<td></td>
<td>B (5.1-7 years)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (7.1 to 8 years)</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Preference for restoration among the three groups

<table>
<thead>
<tr>
<th>Picture of restoration</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Chi square test p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIC</td>
<td>0.00</td>
<td>1.00</td>
<td>0.00</td>
<td>0.223; NS</td>
</tr>
<tr>
<td>Composite</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>0.199; NS</td>
</tr>
<tr>
<td>PolyCarbonate Crown</td>
<td>2</td>
<td>7</td>
<td>0</td>
<td>0.199; NS</td>
</tr>
<tr>
<td>Open face Stainless steel crown</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Zirconia Crown</td>
<td>30</td>
<td>39</td>
<td>23</td>
<td>0.199; NS</td>
</tr>
</tbody>
</table>

Table 3: Response to questions based on gender

<table>
<thead>
<tr>
<th>Questions asked</th>
<th>Gender</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes (n=)</td>
</tr>
<tr>
<td>Are you satisfied with the appearance of teeth?</td>
<td>M</td>
<td>28</td>
</tr>
<tr>
<td>Are you satisfied with the color of your teeth?</td>
<td>F</td>
<td>18</td>
</tr>
<tr>
<td>Do you wish to have better looking teeth</td>
<td>M</td>
<td>55</td>
</tr>
<tr>
<td>Do you frequently look at your teeth in the mirror?</td>
<td>F</td>
<td>51</td>
</tr>
<tr>
<td>Are you hesitant in smiling?</td>
<td>M</td>
<td>35</td>
</tr>
<tr>
<td>Do you think your friend’s teeth are better?</td>
<td>F</td>
<td>40</td>
</tr>
<tr>
<td>Do you want to undergo treatment for good looking teeth?</td>
<td>M</td>
<td>49</td>
</tr>
<tr>
<td>Do you like the teeth in photo?</td>
<td>M</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>35</td>
</tr>
</tbody>
</table>

Discussion

Esthetics and specifically the dental esthetics is an integral component of personality of both adults and children. This study attempted to understand the dental esthetic insight of children and their preference for restoration of mutilated anterior teeth. The results showed that irrespective of the age and gender, children are conscious about their esthetics from very young age of 4 years. This was evident as 54.8% of the children did not like the picture of unrestored carious teeth and 65.9% of the children were not happy with the appearance of their teeth while 68.14% were dissatisfied with the color of their teeth and 78.5% expressed a
desire for better looking teeth. Therefore, it is imperative for a dentist to remember that a child observes dental esthetic alterations in his/her peers or in him/herself and esthetic restorations in them should be very similar to the appearance of natural primary teeth. In the current study, majority of children were influenced by the appearance of their friend’s teeth and wished to have similar teeth. This reflects the role of friends and peers in self-esthetic perception. Besides, their ability to identify and dislike the unaesthetic and unrestored teeth suggests that they developed esthetic perceptions at a very early age and any negative self-opinions from childhood may influence self-confidence in future. This was evident as majority of children were hesitant in smiling and looked at the mirror very often. Furthermore, the children (71.1%) wanted to undergo treatment to improve their dental esthetics which reflects their consciousness and acceptability for dental procedures. They recognized Zirconia crowns as most acceptable followed by composites and polycarbonate crowns. This was in accordance with another study where Zirconia crowns were suggested as most acceptable restorations for mutilated teeth. Furthermore, increased number of girls were dissatisfied with the appearance and colour of the teeth while more number of boys had a psychological impact of unaesthetic teeth. This was revealed from the fact that the latter wished better looking teeth, frequently saw teeth in mirror, were hesitant in smiling and perceived friend’s teeth to be better. They wanted to undergo esthetic dental treatment which is in accordance with another study whereby the boys were more saddened with the unaesthetic appearance of the teeth.

Children “do feel sad about their own mouths” and any alterations to primary anterior teeth escalates their dissatisfaction. For children, dental esthetics are the main reason for seeking dental treatment and age showed no significant association with their feelings. These results are significant as a very young child is often neglected by the dentist while choosing a treatment plan. Recent work in child psychology shows that consciousness about self can begin as early as 3–5 years of age which was evident in the present study also. It was attributed increased exposure to media from a very young age. In the present study the four year old children opinions were very close to those of older children and could perceive esthetics of their mutilated teeth, which should be restored. Just because the primary incisors would be replaced cannot be accepted as an excuse for negligence and the pediatric dentist should take care about this aspect.

Conclusion

The present study showed that irrespective of age and gender, children were affected by dental esthetic alterations and were motivated to receive treatment. They effectively perceived resemblance to natural teeth as majority of them preferred zirconia crowns for esthetic rehabilitation. A pediatric dentist should keep esthetics in mind before planning treatment of mutilated primary anterior teeth and should counsel the parents about the esthetics of primary anterior teeth. This would further improve the quality of life and personality development of children with damaged primary anteriors.

Conflict of Interest – None

Source of Funding: None

Ethical Clearance – Ethics Committee of Kasturba Hospital, Manipal, Karnataka, India (IEC 826/2016)

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Human Capital and their Working Environment: A Study with Special Reference to Health and Safety of Manufacturing MSMEs in Emerging Economy

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Abstract

Much of the literatures were heavily focusing on the importance of human resource management among large enterprises. As we are in the era of knowledge economy, it is important that knowledge forms the pillar for the development of an enterprise. It is imperative for both entrepreneurs and workers. Also, it is necessary for creating a healthy environment to absorb such knowledge practices among entrepreneurs as well as workers. Thus the present study focuses on micro, small and medium enterprises which share a major portion of Industrial sector in emerging economy. Providing favorable working atmosphere for workers especially with reference to healthy and safe atmosphere, is given least importance by the owners of SMEs and the study claims to fill the gap on the same. The study is also useful to managers, policymakers, as well as academicians as it stresses on the necessity of human capital investment among MSMEs.

Keywords: Human resources, working conditions, MSMEs, knowledge economy, emerging economy.

Introduction

The concept of human capital has been widely discussed among entrepreneurs especially in developed countries. But it is being discussed less among the workers especially, belonging to small and medium enterprises. Humans without creative mind have nothing to contribute towards industrial development. Moving from traditionally focused man made products, now the industries are moving towards machine building capacity, where the men operating the same, should process the knowledge on how to operate such automated systems. The workers of developing countries should realize the knowledge acquired at present becomes outdated as the world is moving in a technological era.

Small and medium enterprises are the heart and soul of both developed and developing economy. In order to survive, they should be well versed in new and improved technologies, where the role of entrepreneurs as well as workers in contributing towards manufacturing output through extensive learning has turned a matter of debate. It is being noticed that smaller firms provide lesser attention to the development of human assets. In the case of developing economy, especially India, Micro, Small and Medium Enterprises are considered as seed bed for employment generation. Researchers identified specifically the role played by manufacturing sector, in creating employment is worth to be noted. India is blessed with immense knowledgeable and skilled workers. Small and medium enterprises enhance the employment generation capabilities with respect to manufacturing sectors. It is being argued that entry as well as exit with respect to employment in SMEs is not much complicated. To have well-equipped MSMEs with sophisticated technology, the entrepreneurs as well as the workers should welcome such recent changes. For ensuring the same, it is the responsibility of the entrepreneurs to provide their workers with good amenities and facilities together with molding and training to make them aware of the advantages and disadvantages of technology improved machineries.
Thus, it is necessary to provide them with a healthy atmosphere which is being discussed subsequent topics.

**Literature Reviews**

As per the theory of Resource based view, resources can be categorized as physical capital, human capital and organizational capital. How well the human stocks are managed effectively and efficiently especially with respect to small and medium enterprises is being discussed as an emerging topic by the researchers. Human capital is the aggregate of knowledge, skill, and experience inherent as well as acquired by the individual worker. A developing country is characterized not by increasing stocks of human capital; instead it exhibited a declining trend in human capital stock. Evidences from empirical researches proved that experience is an important constituent of human capital. A better working environment coupled with better occupational health and safety, wages, flexible working hours, as well as training facilities. The manager of small and medium enterprises will always have a practice of curtailing cost, which has an indirect effect on excessive labor turnover. A multiple factors were used for measuring organizational climate. Even in the developed countries, studies proved that workers irrespective of younger as well as older age groups are exposed to chronic illness due to unhealthy working atmosphere. Favorable working environment is also influenced by fair remuneration as well as financial incentives. Financial benefits are essential for drilling out the competencies inherent among the workers, which ultimately enriches the standard of living among workers.

**Statement of the Problem**

Micro Small and Medium Enterprises suffers from resource deficiencies especially in connection with skilled workforce which may hamper the operational efficiency of MSMEs. Researchers pointed that India is placed highest next to Philippines with respect to turnover rates of skilled workforce. This poses a serious threat towards the productivity of manufacturing sectors, especially small and medium enterprises. The requirement of skilled workforce is increasingly important in the production sites of micro, small and medium enterprises. Increased turnover rates may due to inadequate working atmosphere which makes the workers dissatisfied. This necessitated creation of a positive work environment which leads to reduction in attrition rates of workers.

The present study travels along with the workers in the production plant of Kerala, which is considered as aspiring hub among Southern region of Kerala and also identifying the important factors which creates a favorable work environment, which enables the MSMEs to gain competitive advantage over others.

**Objectives of the Study**

To identify whether the mean scores of human capital remains the same with respect to physical settings at work place among Micro, Small and Medium Enterprises.

**Research Methodology**

The study is purely descriptive and analytical in nature. The working environment of plant workers has been studied based on interview schedules based on established literatures. All constructs were selected based on conducting reliability test of Cronbach’s alpha greater than 0.7. Kerala is projected to become aspiring hub of the report of Make in India Initiative. Also Kerala is placed least among the top 10 States in the growth of Micro, Small and Medium Enterprises, based on the report of Entrepreneurs Memorandum Part II registered as per Ministry of MSME 2014-15. As a measure to improve the competitiveness among Kerala MSMEs, an initiative called Kerala Perspective Plan 2030 was developed by Kerala State Planning Board, 2015, to develop a sound and sustainable industrial base. It also aimed to improve the skill level of workers, which proves to be important in this knowledge driven economy.

A favorable working environment is influenced by several factors proposed by was the basis of framing interview schedules in relation to work environment. The scale designed is applicable irrespective of the nature of the organization. An exploratory factor analysis is performed in order to reduce huge set of variables into a reduced size. The production workers in the plant are selected from engineering, food and plastic sectors. The total number of population of production workers in the plant is about 1158 and through the method of simple random sampling, sample size of 215 is selected for the study.

**Analysis and Interpretation**

The results of descriptive analysis are as follows: From the descriptive analysis, the concentration of production workers is higher in micro and medium
sectors of about 36 percent (both micro and small). In micro sectors, machines are of manual and semi-automatic in nature. Thus the worker requirements in those plants are higher. In the case of medium sectors, there is a need to cater to bulk production requirements. Also the manufacturing activity ranges from sorting, grading, assembling as well as packaging. Therefore for performing these functions, greater manpower requirements are essential. The proportion of male workers (71 percent) is higher than female workers in the production plant (60 percent). This is because more heavy and skilled labors are required in the production plant. Even though female workers are employed in the plant, there remains a problem of their continuous existence.

### Exploratory Factor Analysis

For performing exploratory factor analysis, Keyser Meyer Oklin measure of sampling adequacy should be greater than 0.5, where the present study’s KMO value is about 0.8 which is adequate. Also Bartlett’s test of sphericity also generated significant value of less than 0.05. Rotated component matrix was used to interpret the factors which have a highest loading to least loaded among the work environment factors. By conducting exploratory factor analysis, 7 factor component matrix was generated. A questionnaire with 38 items was distributed to the respondents and by conducting factor analysis 3 questions were eliminated because of low factor loading less than 0.4. A rotated component matrix table was generated which determines the important factors of work environment of plant workers among MSMEs.

#### Table no. 1: Rotated Component Matrix table

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection of work surroundings</td>
<td>0.820</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>coolers, toilets in adequate areas</td>
<td>0.809</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>measures to control accidents</td>
<td>0.809</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>effectiveness of emergency situations</td>
<td>0.775</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>first aid</td>
<td>0.734</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective equipments</td>
<td>0.716</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution control measures</td>
<td>0.555</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>suggestion schemes</td>
<td></td>
<td>0.793</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>performance appraisal</td>
<td></td>
<td>0.705</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off the job training</td>
<td></td>
<td>0.753</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On the job training</td>
<td></td>
<td>0.704</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Updating the technology</td>
<td></td>
<td>0.671</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotional policies</td>
<td></td>
<td>0.652</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in decision making</td>
<td></td>
<td>0.643</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encouraging higher education</td>
<td></td>
<td></td>
<td>0.702</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness in new technology</td>
<td></td>
<td></td>
<td>0.701</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee counselling</td>
<td></td>
<td></td>
<td></td>
<td>0.485</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cont... Table no: 1  Rotated Component Matrix table

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rotation Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge in work</td>
<td>0.453</td>
</tr>
<tr>
<td>Discipline</td>
<td>0.429</td>
</tr>
<tr>
<td>Flexible working hours</td>
<td>0.847</td>
</tr>
<tr>
<td>leave facility</td>
<td>0.817</td>
</tr>
<tr>
<td>housing facility</td>
<td>0.812</td>
</tr>
<tr>
<td>canteen facility</td>
<td>0.782</td>
</tr>
<tr>
<td>recreation facility</td>
<td>0.751</td>
</tr>
<tr>
<td>transport facility</td>
<td>0.745</td>
</tr>
<tr>
<td>Rest time</td>
<td>0.718</td>
</tr>
<tr>
<td>Achievement of personal goals</td>
<td>0.629</td>
</tr>
<tr>
<td>feeling of competence</td>
<td>0.482</td>
</tr>
<tr>
<td>loans for purchase of goods</td>
<td>0.872</td>
</tr>
<tr>
<td>Educational loans</td>
<td>0.827</td>
</tr>
<tr>
<td>Bonus</td>
<td>0.713</td>
</tr>
<tr>
<td>Fairness in wages and salary</td>
<td>0.467</td>
</tr>
<tr>
<td>Retirement benefits</td>
<td>0.453</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Source: Primary data

From table no: 5, the first and foremost factor responsible for generating a favorable working environment is the Physical setting of the work place. Mostly the infrastructure in relation to plant with reference to proper ventilation, lights and pollution free atmosphere is very crucial for ensuring healthy workplace among the plant workers with respect to micro, small and medium enterprises. It is being established in various literatures that health issues reports with respect to workers is increasing especially those who are engaged in small and medium enterprises. Eye diseases, hearing losses, respiratory problems, and skin diseases are the most commonly reported issues. Therefore, the remaining sections of the paper focuses on the human capital of workers in the plant differ with respect to physical settings at the work place among MSMEs.

Hypothesis

The mean scores of human capital of plant workers remain the same with respect to physical settings at work place among MSMEs.

Table no: 2 Differences in human capital with respect to physical settings at work place among micro sectors.

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Experience</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-graduation</td>
<td>2.7164</td>
<td>2</td>
<td>0.00000</td>
<td>Below 5 yrs</td>
<td>1.5102</td>
<td>21</td>
<td>0.66635</td>
</tr>
<tr>
<td>Degree</td>
<td>2.7143</td>
<td>2</td>
<td>0.40406</td>
<td>5-10 yrs</td>
<td>1.9107</td>
<td>24</td>
<td>0.85280</td>
</tr>
<tr>
<td>Diploma in Industrial training</td>
<td>2.5113</td>
<td>18</td>
<td>0.84155</td>
<td>10-15 yrs</td>
<td>2.0420</td>
<td>17</td>
<td>1.14148</td>
</tr>
<tr>
<td>Pre degree</td>
<td>1.5268</td>
<td>16</td>
<td>1.00708</td>
<td>15-20 yrs</td>
<td>2.7976</td>
<td>12</td>
<td>0.72705</td>
</tr>
<tr>
<td>SSLC</td>
<td>1.9752</td>
<td>23</td>
<td>0.71253</td>
<td>20-25 yrs</td>
<td>2.7143</td>
<td>2</td>
<td>0.00000</td>
</tr>
<tr>
<td>Below SSLC</td>
<td>1.8651</td>
<td>18</td>
<td>0.97935</td>
<td>Above 25 yrs</td>
<td>2.1429</td>
<td>3</td>
<td>0.00000</td>
</tr>
<tr>
<td>Total</td>
<td>1.9964</td>
<td>79</td>
<td>0.92156</td>
<td>Total</td>
<td>1.9964</td>
<td>79</td>
<td>0.92156</td>
</tr>
</tbody>
</table>

Source: Primary data
From table no: 2, it is being inferred that, with respect to education of plant workers, those workers with respect to highest educational qualifications is perceived to have highest perception in connection with physical settings. Such workers may be technicians, biochemists, who are directly responsible for conforming to the quality of the products. But in micro sectors, the number of technicians is relatively less as a result of improper and unhealthy safety practices. In micro sectors, workers working in the plant are not provided with goggles, gloves, helmets as protective measure to safeguard their health. Workers complain about carrying of heavy sacks which causes severe muscle cracks and injuries. As majority of workers are having basic or below basic education, the entrepreneurs are careless in treating the workers and as a result plant workers turnover rates tends to be increasing. Despite the plant workers with higher experience ranging from 15-20 years is relatively higher. Plant workers having basic education are higher in micro sectors. They perform the job without having any demands and such workers are highly satisfied with the working atmosphere. They are provided with safety measures in order to overcome occupational hazards in relation to their respective units. These workers are given an initial training with regard to safety and healthy practices with respect to a particular job.

Table no: 3 Differences in human capital with respect to physical settings at work place among small sectors.

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Experience</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>3.4762</td>
<td>3</td>
<td>1.15470</td>
<td>Below 5 yrs</td>
<td>3.4706</td>
<td>17</td>
<td>1.07709</td>
</tr>
<tr>
<td>Post-graduation</td>
<td>4.2857</td>
<td>1</td>
<td>0.00000</td>
<td>5-10 yrs</td>
<td>3.0204</td>
<td>21</td>
<td>1.11326</td>
</tr>
<tr>
<td>Degree</td>
<td>3.1190</td>
<td>6</td>
<td>1.06682</td>
<td>10-15 yrs</td>
<td>3.2088</td>
<td>13</td>
<td>1.12125</td>
</tr>
<tr>
<td>Diploma in Industrial training</td>
<td>3.0602</td>
<td>19</td>
<td>1.22272</td>
<td>15-20 yrs</td>
<td>3.7619</td>
<td>3</td>
<td>1.40214</td>
</tr>
<tr>
<td>Pre degree</td>
<td>2.9048</td>
<td>6</td>
<td>1.30827</td>
<td>20-25 yrs</td>
<td>3.5714</td>
<td>4</td>
<td>0.70951</td>
</tr>
<tr>
<td>SSLC</td>
<td>3.6875</td>
<td>16</td>
<td>0.90082</td>
<td>Total</td>
<td>3.2709</td>
<td>58</td>
<td>1.08424</td>
</tr>
<tr>
<td>Below SSLC</td>
<td>3.1020</td>
<td>7</td>
<td>0.92108</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.2709</td>
<td>58</td>
<td>1.08424</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary data

From table no: 3, is clear that workers having highest educational qualification and higher experience replied with a positive opinion in relation to the healthy working environment in relation to small sectors. Their educational levels significantly influence their consciousness towards safety practices which enhances the productivity of respective units. Among various factors of working environment, experienced workers motivation to continue in the work is largely influenced by the infrastructural amenities and facilities provided at the work place.

Table no: 4 Differences in human capital with respect to physical settings at work place among medium sectors.

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Experience</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-graduation</td>
<td>4.4286</td>
<td>12</td>
<td>1.27551</td>
<td>Below 5 yrs</td>
<td>3.3265</td>
<td>7</td>
<td>1.65926</td>
</tr>
<tr>
<td>Degree</td>
<td>3.8690</td>
<td>1</td>
<td>0.00000</td>
<td>5-10 yrs</td>
<td>2.7075</td>
<td>21</td>
<td>0.97570</td>
</tr>
<tr>
<td>Diploma in Industrial training</td>
<td>3.7202</td>
<td>24</td>
<td>1.13388</td>
<td>10-15 yrs</td>
<td>3.9493</td>
<td>31</td>
<td>1.05917</td>
</tr>
<tr>
<td>Pre degree</td>
<td>3.5714</td>
<td>11</td>
<td>1.44420</td>
<td>15-20 yrs</td>
<td>4.2460</td>
<td>18</td>
<td>0.47458</td>
</tr>
<tr>
<td>SSLC</td>
<td>3.7922</td>
<td>11</td>
<td>1.26550</td>
<td>20-25 yrs</td>
<td>5.0000</td>
<td>1</td>
<td>0.00000</td>
</tr>
<tr>
<td>Below SSLC</td>
<td>3.3083</td>
<td>19</td>
<td>0.92123</td>
<td>Total</td>
<td>3.6410</td>
<td>78</td>
<td>1.15892</td>
</tr>
<tr>
<td>Total</td>
<td>3.6410</td>
<td>78</td>
<td>1.15892</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary data
From table no: 4, it is being inferred that, the human capital of plant workers with respect to physical settings is high among workers having higher educational background and those having greater experience. It is of great pleasure to the plant workers to work in such a healthy and safe working environment and as a result, they are having an urge to work in that related field. It is being inferred that even in the case of medium sectors, the workers who are highly qualified are comparatively low. But for certain jobs, workers with specified technical qualification is mandatory and intake in relation to the same is very poor. Despite the medium sectors are vigilant towards equipping the plant with better production technologies. Irrespective of micro, small and medium enterprises, the concentration of aged group is high and therefore quarterly training in relation to safety measures and practices together with formation of committees to discuss safety measures has become common practice among medium sectors. Technology oriented units should be more cautious as it involves heavy work in terms of cutting, bending, welding which may cause severe health hazards to workers in the plant. Also the surroundings are kept neat and tidy.

Suggestions and Conclusions

Plant workers who are having low levels of education should be provided with safety training and classes periodically to ensure their safety and health, especially in the case of micro and small sectors. The traces of metal scraps in the work surroundings increase the possibility of injuries, and keeping the surroundings neat and tidy is mandatory. Plant should be constructed in such a way that appropriate space should be allocated to each manufacturing task. At present, the plant is congested without giving consideration to movement of workers which hamper the productive efficiency of workers. Cranes should be encouraged for moving bunch of stock from one place to another. Use of protective mask, gloves, helmets etc. should be made mandatory. Hazardous materials which are highly inflammable should be located in an isolated area.

Conflict of Interest: Nil

Source of Funding: Self-funded

Ethical Clearance: Not indicated

References

Are Muslims Incurring Higher Out-of-Pocket Expenditures than Hindus in Reproductive Healthcare at Sub-District Levels in Karnataka?

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Abstract

Background and Objective: This study was undertaken to evaluate level of differences found in Out-of-pocket expenditures (OOPE) among Hindus and Muslims, OOPE being a sub-component while constructing reproductive health account (RHA) matrices for Ramanagara district, Karnataka.

Method: Adopting multistage stratified sampling method, individual level data was collected using survey tools, catering to six dimensions of RH functions, taken from ‘WHO Guide to produce RH Sub-Account’. 517 Hindu and Muslim men and women meeting inclusion criteria of reproductive age (15-49) incurring RH expenditures in last one year were included followed later by only 382 uninsured individuals for hypothesis testing.

Results: Muslims showing almost double OOPE in RH necessitated hypothesis testing of significant difference in OOPE, equating groups, post exclusion of insured individuals. Statistically significant difference was revealed in RH expenditures using Mann-Whitney U test.

Interpretations and conclusions: Vicious cycle of disparity in education levels, lower income levels, negligible health coverage, strenuous work conditions, poor living standards, repeated RH contingencies leading to massive borrowing financed OOPE in RH continues.

Keywords: Reproductive health, Health expenditures, OOP health expenditure, Health insurance, Health and Inequality

Introduction

Out-of-pocket payments (OOPPs) are defined as direct payments made by individuals to health care providers at the time of service use excluding any prepayment for health services.1 According to National Human Rights Commission (NHRC) report, 66% of all health expenditures are borne by OOPE. In RH, only 21% access full free Antenatal Care (ANC) and 5% avail maternity leave. 6000 INR guaranteed by National Food Securities Act (NFSA) pertains to first child only.2

Pre-NHM and post-NHM status failing to show difference when compared using data from 60th and 71st rounds of National Sample Survey (NSS) evokes concern similar to us.3 Demographic variables majorly influenced prevalence of RH disorders and treatment seeking behaviour.4 Yet, OOPE in RH of Muslims was found lesser than Hindus in Karnataka (category B state) was intriguing.5

Our study was convinced with the Sachar and Kundu Committee report that share of Muslims in regular income jobs was extremely low and hint at possible discrimination6,7 moreover negligible reversible contraception methods led to 2.61 Fertility Rate (FR)

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among Muslim women. Our study wanted to test parity in OOPE in RH in light of the state’s Integrated Public Health Policy 2017 claiming equity in socio-demographic factors.

Sachar, Kundu and the High Level Expert Group (HLEG) reports recommended need of small-scale regional studies for looking into needs of minority communities. Not many studies in RH sector have been undertaken at sub-district levels and no study has been so far done to compare the RH expenditures between uninsured Hindus and Muslims. This study is an effort in this direction. The researchers wanted to test the hypothesis of presence of a significant difference in amount of OOPE involved in various RH functions across Hindus and Muslims.

**Material and Method**

*Study design:* We used cross-sectional survey design adopting multistage stratified sampling method. Karnataka, a state, lagging in RH indicators in Southern India, chosen in first stage was followed by Ramanagara, a medium developed RH indicator district in second stage. Third stage involved choosing two talukas Ramanagara and Chennapatna indicating medium RH performance.

Ramanagara district has 1 district hospital, 3 general hospitals, 4 community health centres (CHCs), 61 primary health centres (PHCs), 240 sub-centres, and 4 urban primary health centres (UPHC). In the fourth stage 10 PHCs were chosen, 3 each from rural areas in both the talukas, 2 PHCs and 1 CHC in urban area of Ramanagara taluka and 2 PHCs and 1 District Taluka Hospital in urban Chennapatna Taluka. Permission was taken from the Ramanagara District Health Office to visit these 12 Health Facilities and administer the questionnaires to those individuals who visited these facilities. In the final stage the questionnaire was administered to only those individuals who confirmed incurring RH expenditures in last one year (March 2017-March 2018).

*Data collection:* The survey tools Men’s and Women’s questionnaires (used as interview schedules) catering to RH, Pregnancy, Neonatal, Family Planning, Abortion and Miscarriage issues taken from ‘WHO Guide to produce RH Sub-Account’ for collecting data covered curative, preventive, rehabilitative, palliative, ambulatory and psycho-social support for in-patient and out-patient health expenditures incurred at various health provider levels including patient and attendants’ expenditures on consultation, drugs, radiology, dietary supplements, accommodation charges, food and transport.

According to 2011 Ramanagara census, 56.01% of total population of 1082636 is in RH age group (15-49) i.e. 606384 individuals. Deciding on confidence level of 95% and a confidence interval of 1.25 the sample size estimated was 6085. As per PHCs, in a year, not more than 1/10th of RH age group would face any RH situation, a sample size of maximum 600 individuals was estimated.

517 individuals including 129 Hindus and 130 Muslims (132 Males and 127 Females) and 130 Hindus and 128 Muslims (131 Males and 127 Females) were chosen from Ramanagara and Chennapatna talukas respectively.

*Statistical analysis:* Data was processed using Excel and SPSS 20. The OOPE on RH, dependent scaled variable consisted of expenditures incurred on 6 RH functions. The dependent variable was mapped against the categorical variable of two religions constituting 99.2% of the total population in the district.

Finding a huge difference between the two religions, study was extended to find if significant differences persist in OOPE among uninsured individuals. Since sample included 191 Hindus and 255 Muslims who were uninsured, it was decided to select 191 Hindus and 191 Muslims for comparing actual differences in OOPE in RH in the last one year. (dropping off 64 outlier cases). Post estimation of descriptive statistics and failure of normality, non-parametric (Mann-Whitney U) test was performed to prove hypothesis of a significant difference existing in RH expenditures incurred on the six RH functions across Hindus and Muslims.

*Ethical consideration:* Institutional ethical clearance was taken before data collection. After orientation about study details, privacy concerns and interview environment verbal consent was taken from all participants. Minors and illiterates were interviewed in the presence of another adult family member. Data was aggregated maintaining complete privacy of personal details.
Findings

Table I shows that very few Muslims reached ‘beyond middle school’. Outcome can be occupation bias and job engagement at seasonal, low-paid daily-wage. Further negligible insurance coverage was found among Muslims all leading to heavy borrowing to finance OOPE in RH.

Table II shows an average Muslim incurring two to five times higher OOPE in RH than a Hindu in all RH functions considered in this study. To find out whether the difference was caused due to a greater number of insured individuals among Hindus it was necessary to find out the actual difference between the two communities after removing the effect of insurance.

Table III reveals a visibly greater amount of per capita OOPE in RH expenditure incurred on three RH functions after removing the influence of insurance. It was important to find out whether this difference in OOPE in RH expenditures was statistically significant. Before choosing a parametric test for finding this out it was imperative to know the normality of the sample data on RH expenditures.

Table IV shows non-normality of data on all the six accounts of OOPE in RH expenditures. A hypothesis of statistically significant difference existing between OOPE in RH expenditures of the two communities was tested using non-parametric Mann-Whitney U test.

Table V shows that a statistically significant difference exists in OOPE in RH between the two communities across three RH functions pertaining to reproductive health, prenatal till postpartum health and neonatal health.

Table I: Descriptive statistics of the sample before hypothesis testing

<table>
<thead>
<tr>
<th>Religion</th>
<th>Total number of individuals</th>
<th>% of Individuals up to Middle school education</th>
<th>% of Individuals beyond Middle school education</th>
<th>% in Occupations (excluding labourers, unemployed)</th>
<th>% of Regular Earners (excluding irregular and in kind)</th>
<th>Average Per Capita Annual Income (in Indian Rupees)</th>
<th>% financing RH expenditure by borrowing</th>
<th>% Covered by private and social welfare insurances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindus in sample</td>
<td>259</td>
<td>86.87</td>
<td>70</td>
<td>37.5</td>
<td>37.5</td>
<td>2,90,845</td>
<td>10.4</td>
<td>25.9</td>
</tr>
<tr>
<td>Muslims in sample</td>
<td>258</td>
<td>83.33</td>
<td>9</td>
<td>5.4</td>
<td>5.4</td>
<td>1,20,890</td>
<td>96</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: Survey Data collected by Researchers

Table II: Reproductive Health Expenditures Incurred by Hindus and Muslims before hypothesis testing (in Indian Rupees)

<table>
<thead>
<tr>
<th>Per-capita and total expenditure incurred</th>
<th>RH disorder/ wellbeing</th>
<th>Pre-natal (mother and foetus), delivery and post-partum (mother) up to 28 days after childbirth</th>
<th>Neo-natal healthcare of new-born up to 6 weeks</th>
<th>Family Planning</th>
<th>Abortion</th>
<th>Miscarriage</th>
<th>Total amount spent on RH related expenditures in last one year by Hindus and Muslims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindus Total Expenditure</td>
<td>8,33,884</td>
<td>15,93,108</td>
<td>3,76,479</td>
<td>15,093</td>
<td>4,626</td>
<td>15,622</td>
<td>28,38,811</td>
</tr>
<tr>
<td>Hindus Per Capita Expenditure</td>
<td>5,999</td>
<td>5,551</td>
<td>1,298</td>
<td>5,031</td>
<td>4,626</td>
<td>5,207</td>
<td>55,01,491</td>
</tr>
<tr>
<td>Muslims Total Expenditure</td>
<td>5,07,150</td>
<td>32,27,106</td>
<td>9,18,660</td>
<td>3,36,022</td>
<td>3,12,040</td>
<td>2,00,512</td>
<td>55,01,491</td>
</tr>
<tr>
<td>Muslims Per Capita Expenditure</td>
<td>26,692</td>
<td>18,441</td>
<td>5,190</td>
<td>10,501</td>
<td>16,423</td>
<td>16,709</td>
<td>55,01,491</td>
</tr>
</tbody>
</table>

Source: Survey Data collected by Researchers
### Table III: Reproductive Health Expenditures Incurred by Uninsured Hindus and Muslims (in Indian Rupees)

<table>
<thead>
<tr>
<th>Per-capita and total expenditure</th>
<th>RH disorder/wellbeing</th>
<th>Pre-natal (mother and foetus), delivery and post-partum (mother) up to 28 days after childbirth</th>
<th>Neo-natal healthcare of newborn up to 6 weeks</th>
<th>Family Planning</th>
<th>Abortion</th>
<th>Miscarriage</th>
<th>Total amount spent on RH related expenditures in last one year by Hindus and Muslims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindus Total Expenditure</td>
<td>6,74,431</td>
<td>14,92,933</td>
<td>3,25,469</td>
<td>27,351</td>
<td>0</td>
<td>25,452</td>
<td>25,45,636</td>
</tr>
<tr>
<td>Hindus Per Capita Expenditure</td>
<td>6,612</td>
<td>17,773</td>
<td>3,875</td>
<td>13,676</td>
<td>0</td>
<td>12,726</td>
<td></td>
</tr>
<tr>
<td>Muslims Total Expenditure</td>
<td>5,19,120</td>
<td>31,65,937</td>
<td>8,52,341</td>
<td>64,794</td>
<td>17,856</td>
<td>16,630</td>
<td>46,36,678</td>
</tr>
<tr>
<td>Muslims Per Capita Expenditure</td>
<td>27,322</td>
<td>18,406</td>
<td>4,899</td>
<td>10,799</td>
<td>940</td>
<td>1,386</td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data collected by Researchers

### Table IV: Normality test results of RH expenditures across RH functions among Hindus and Muslims

<table>
<thead>
<tr>
<th>Tests of Normalityb</th>
<th>Religion</th>
<th>Kolmogorov-Smirnova</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>Reproductive Health OOP</td>
<td>Hindu</td>
<td>.273</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>.495</td>
<td>190</td>
</tr>
<tr>
<td>Prenatal till postpartum OOP</td>
<td>Hindu</td>
<td>.336</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>.156</td>
<td>190</td>
</tr>
<tr>
<td>Neonatal OOP</td>
<td>Hindu</td>
<td>.299</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>.139</td>
<td>190</td>
</tr>
<tr>
<td>Family Planning OOP</td>
<td>Hindu</td>
<td>.521</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>.523</td>
<td>190</td>
</tr>
<tr>
<td>Abortion OOP</td>
<td>Muslim</td>
<td>.524</td>
<td>190</td>
</tr>
<tr>
<td>Miscarriage OOP</td>
<td>Hindu</td>
<td>.524</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>.524</td>
<td>190</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

b. Abortion OOP is constant when Religion = Hindu. It has been omitted.

Source: SPSS 20 Normality test output
Hypothesis being tested

There is a difference in RH expenditures incurred on the six RH functions across the two religious groups namely Hindus and Muslims.

Table V: Test results of Non-parametric test

<table>
<thead>
<tr>
<th>Reproductive Health disorder OOP</th>
<th>Prenatal till postpartum OOP</th>
<th>Neonatal OOP</th>
<th>Family Planning OOP</th>
<th>Abortion OOP</th>
<th>Miscarriage OOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>10632.500</td>
<td>9958.000</td>
<td>8821.000</td>
<td>17760.000</td>
<td>18049.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>28777.500</td>
<td>28294.000</td>
<td>27157.000</td>
<td>36096.000</td>
<td>36385.500</td>
</tr>
<tr>
<td>Z</td>
<td>-8.462</td>
<td>-7.792</td>
<td>-8.866</td>
<td>-1.442</td>
<td>-1.003</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.149</td>
<td>.316</td>
</tr>
</tbody>
</table>

Source: SPSS 20 Non-parametric test output

Discussion and Conclusion

Finding of this study that Muslims were more engaged in occupations which were physically strenuous, seasonal and low paid indicating a toll on their RH is similar to the finding of earlier studies. \(^{12,13}\) 19 RH disorder cases among Muslims yet adding up to 77% of RH disorder expenditure of Hindus with 102 RH disorder cases corroborates this. Their negligible insurance coverage mainly financed by heavy borrowing leading to poor nutritional habits, hygiene and habitation conditions, was termed as impoverishment by another study. \(^{14}\)

On an average it was found that Muslim individuals had a family size of six compared to Hindus having four. The Muslim women having delivered before were ineligible for cash support from schemes like ‘Extended Thayi Bhagya (Plus)’. Each day of missed work led to wage loss drove them towards private tertiary level providers claiming faster recovery rates, better reputation and easier access. This is similar to what has been reported earlier. \(^{15}\)

Study finding that frequent pregnancies and childbirth with not much attention provided to one’s health might have added to their RH disorders is in line with an earlier study report. \(^{16}\) The number of abortions and miscarriages were also found to be higher in Muslim women unlike Hindu women is supported by a recent study. \(^{17}\)

Although the hypothesis was supported yet the study suffers from limitation arising out of difficult recall and evidence about one year of expenditure amounts incurred on various heads. The study was delimited to only 12 Health facilities and respondents were chosen from individuals who visited these facilities mostly belonging to neighbouring areas.

In conclusion, the findings of this study are consistent with the claim of researchers that the OOP expenses are extremely high for people in transitioning economies and that they are deeply influenced by socio-economic factors. \(^{4,6,17,18}\)

Policy Recommendations

Our first finding indicating Muslim individuals rarely reached ‘beyond middle school’ is in line with two earlier reports. \(^{6,18}\) This is one reason why they face occupation bias and are recruited in jobs which are seasonal, low-paid and based on daily-wages. \(^{11}\)

Incentivising schemes like RMSA and low interest entrepreneurship funding for minority start-ups is recommended.

Second finding of negligible insurance coverage and awareness among Muslims is supported by other
We therefore recommend inclusive social welfare schemes like ‘Prasothi Araike’ and ‘Extended Thayi Bhagya Plus’ to be made available irrespective of restraints like number of live births. Thorough investigation into Central government schemes like ‘Pradhan Manthri Mathru Vandana Yojana’ reportedly of little use, due to eligibility and disbursement criterions, is needed.

Third finding shows two to five times higher OOPE in RH incurred by an average Muslim individual in all RH functions is supported by an earlier study. We strongly suggest introduction of better sickness and maternity benefit packages in informal sector.

Our last finding revealed higher per capita RH expenditure among uninsured Muslims on three RH functions is in contrast to an earlier study finding of convergence of OOPE among the two communities. Reason cited for lower preference for public facilities due to absence of doctors, rude behaviour, longer queues, medicine shortage and distance is supported by an earlier study. A designated monitoring committee needs to look into such matters of lack of medical infrastructure and disrespectful attitude of health professionals thereby giving more meaningful direction to individual finances saved.

Acknowledgement: We deeply appreciate the support of District Health and Family Welfare Office, Ramanagara District.

Conflict of Interest: None

Funding: None

Statement of Declaration: The manuscript, an original work, has been read and approved by both the authors. It is being submitted for the first time for publication to any journal.

References


Basant R. Education and employment among Muslims in India: An analysis of patterns and trends.


Factors Affecting Delivery of Maternal and Newborn Care in Rural Public Health System in Madhya Pradesh, India

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¹PhD Scholar, Tata Institute of Social Sciences, Mumbai, Maharashtra, India,
²Professor, School of Health Systems Studies, Tata Institute of Social Sciences, Mumbai, India

Abstract

Supply side factors affect maternal and child health indicators. This review discusses the current status of maternal and child health indicators in the Indian State of Madhya Pradesh, and the various factors affecting healthcare delivery in rural settings.

Supply side factors like infrastructure, human resources, logistics support, medicines and other equipments affect health care delivery by nurses who are the primary care providers in almost 75% of the rural population in India.

Keywords: Maternal care, Newborn care, Rural public health system, barriers for health care delivery

Introduction

The World Health Organization (WHO) has recommend in the Sustainable Developmental Goal (SDG) 3 a health target to reduce the global maternal mortality ratio to less than 70 per 100,000 births. However, majority of the developing countries are far from achieving these goals [1]. This is due to the poor healthcare delivery system in majority of the African, Latin American and South Asian countries [1]. Globally, most of the maternal deaths occur during antenatal, natal, delivery and postnatal periods [2,3]. Maternal mortality is higher among women living in rural areas and poorer communities [1].

The high number of maternal deaths in some areas of the world reflects inequities in access to health services, and highlights the gap between the rich and the poor. Almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and almost one-third occur in South Asia. More than half of maternal deaths occur in fragile and humanitarian settings [1]. The major complications that account for nearly 75% of all maternal deaths are severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (pre-eclampsia and eclampsia), complications from delivery and unsafe abortion [4]. All of them are preventable with proper healthcare delivery system.

Another very important aspect is newborn care. It was estimated that approximately 2.7 million newborn babies died in 2015 [5], and an additional 2.6 million were stillborn [6]. It is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death for both the mother and the baby.

Antenatal care is the most effective strategy for maternal and newborn health. Approximately three-fourth of India’s population lives in rural area where access to qualified skilled physician is not possible. Hence, nurses can help meet this commitment provided they are skilled, supported and mandate [7].

In this review, we discuss the current maternal and child health indicators in Madhya Pradesh, outline organizational structure of rural public health delivery system and the factors that affect delivery of maternal and newborn care in the rural population.

Maternal health throughout India and in Madhya Pradesh

As per census of India 2011, maternal mortality rate in Madhya Pradesh is 29, which is very high in comparison to national average of 11.7 [8].
Maternal mortality ratio of India is 167 [8] and that of Madhya Pradesh is 310 [12]. Within Madhya Pradesh, it is highest in Shahdol division (435), followed by Sagar (397), Rewa (336), Chambal (311), Jabalpur (310), and lowest in Gwalior division (262) [8].

Child health throughout India and in Madhya Pradesh

Infant mortality rate in India is 42, and in Madhya Pradesh is 67 [20]. There is a wide gap of infant mortality between urban and rural areas of Madhya Pradesh. It is 50 in urban and 72 in rural areas [20]. Infant mortality rate in rural India is 46 and in urban India is 28 [20]. Neonatal health indicators are dismal in Madhya Pradesh. Overall neonatal mortality rate in Madhya Pradesh is 44, with wide difference among rural and urban areas. In rural areas, neonatal mortality rate is 49, while in urban areas, it is 32 [20]. Neonatal mortality rate in India is 29, in rural it is 33 and in urban it is 16 [20]. Initial one-month survival of a newborn is very crucial. Post neonatal mortality rate is 22 in Madhya Pradesh. In rural areas it is 24 and in urban areas it is 18 [8]. Post neonatal mortality rate in India is 12, in rural India it is 14 and in urban India it is 12 [8].

Structure and Methodology

After determining the main challenges for delivering proper maternal and child healthcare in rural and tribal areas, we have reviewed the evidence from relevant literature to determine the different social, economic, and political sources of these challenges.

Our attempt to comprehensively review the factors affecting delivery of proper maternal and child healthcare in rural and tribal areas will be useful to identify potential solutions to these problems.

Rural public healthcare system of India

Public healthcare is based on a three-tier system across India based on the population norms. Almost 75% of the rural population is dependent on nurses for healthcare delivery in rural India.

Three tier system of rural India

Sub centre (SC): It is the first point of contact between primary healthcare and community. Sub centres are responsible for effective communication and maternal and child health services, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases programmes.

There are a total of 153655 sub centers in India. In Madhya Pradesh, 9192 sub centers are functioning. Status of facilities and infrastructure is unsatisfactory in these sub centres. 63.7% of ANM are living in sub center campus quarters. 31.8% of sub centers do not have regular water supply. 20.5% sub centers are running without electricity supply and 18% of sub centers do not have all weather motorable approach road. Shortfall in health infrastructure at sub center level is 26% in Madhya Pradesh [9].

Approximately 14276874 tribals in Madhya Pradesh require 4758 sub centers. However, there are only 2952 functioning sub centers, and there is a shortfall of 1806 sub centers in tribal areas of Madhya Pradesh [9].

Primary health centre: It is first contact point between the community and the medical officer. It provides preventive, promotive and curative health services. It is a referral unit for six sub centers, with 4-6 beds manned by a medical officer in charge, 14 subordinate paramedical staff, one nurse mid-wife (staff nurse) and two additional contractual staff nurses.

In Madhya Pradesh, a total of 1171 primary health centers are functioning. Infrastructure at these primary health centers are inadequate in Madhya Pradesh. About 97.4% of primary health centers do not have labour room, 37% primary centers work without an OT, 9.6% primary health centers do not have water supply, 6.7% of primary health centers do not have all-weather motorable approach road and about 98.4% of primary health centers have four bed capacity. Shortfall in health infrastructure at primary health center level is 41% in Madhya Pradesh [7].

In the tribal areas of Madhya Pradesh, a total of 713 primary health centers are required, but only 332 are present with a shortfall of 381 primary health centers [9].

Community health centre: There are a total of 5396 functioning community health centers across India. In Madhya Pradesh, the number of community health centers is 334. 100% community health centers have a labour room. 313 community health centers have an OT. There are 62 stable newborn care units and 323 newborn care corners in the community health centres of Madhya Pradesh. Shortfall in health infrastructure at
the community health centre level is 33% in Madhya Pradesh [9].

In the tribal areas of Madhya Pradesh, 178 community health centres are needed, but only 104 are present, with a shortfall of 74 community health centres [9].

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**Inadequate infrastructure:** There is a gross deficiency of Primary health center (PHC), Community health centers (CHC) and Sub centers (SC) in many parts of India [11]. Gross deficiency varies from 20-45% in various states. Another major problem faced by healthcare providers is basic amenities like safe water supply and electricity, which are lacking in numerous peripheral centers.

**Deficient manpower:** The second major challenge that affects health care delivery is deficient manpower. Deficiency of manpower varies from region to region, rural and hilly areas, etc. There is unwillingness among doctors and other health personnel to serve in rural areas. The deficiency of specialists in rural healthcare is more than 90% in Chhattisgarh, Jharkhand and Rajasthan, while it was nearly 86% in Uttarakhand and Odisha. Similar deficiencies in manpower and infrastructures were observed in African countries [12].

**Status of human resources in Madhya Pradesh**

There is gross deficiency of human resources in rural and tribal areas. Table 1 shows that the deficiency of doctors and specialists is almost 40-75% of the sanctioned posts in these areas.

**Table 1: Status of human resources in rural health care in Madhya Pradesh [9]**

<table>
<thead>
<tr>
<th>Human resource</th>
<th>required</th>
<th>sanctioned</th>
<th>In position</th>
<th>vacant</th>
<th>Shortfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANM</td>
<td>10363</td>
<td>10473</td>
<td>12412</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Doctors</td>
<td>1171</td>
<td>1658</td>
<td>999</td>
<td>659</td>
<td>172</td>
</tr>
<tr>
<td>Specialist doctors</td>
<td>1336</td>
<td>897</td>
<td>263</td>
<td>634</td>
<td>1073</td>
</tr>
<tr>
<td>Nursing staff</td>
<td>3509</td>
<td>4189</td>
<td>3629</td>
<td>560</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: [wcd.nic.in/sites/default/files/RHS_1.pdf](http://wcd.nic.in/sites/default/files/RHS_1.pdf)

**Table 2: Status of human resources in tribal areas of Madhya Pradesh [9]**

<table>
<thead>
<tr>
<th>Human resource</th>
<th>required</th>
<th>sanctioned</th>
<th>In position</th>
<th>vacant</th>
<th>Shortfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANM</td>
<td>3284</td>
<td>3332</td>
<td>4020</td>
<td>surplus</td>
<td>surplus</td>
</tr>
<tr>
<td>Doctors</td>
<td>332</td>
<td>360</td>
<td>299</td>
<td>61</td>
<td>33</td>
</tr>
<tr>
<td>Specialist doctors</td>
<td>416</td>
<td>229</td>
<td>48</td>
<td>181</td>
<td>368</td>
</tr>
<tr>
<td>Nursing staff</td>
<td>1060</td>
<td>1033</td>
<td>555</td>
<td>478</td>
<td>505</td>
</tr>
</tbody>
</table>
Patient load: Any government healthcare setup in India has heavy patient workload. Some of the doctors even consult more than 200 patients within 3-4 hours in the outpatient department. It is impossible to provide optimal care to a patient in less than a minute. Another problem is absenteeism from duties. In various regions of India, it was found that almost 30-55% of doctors and paramedical staff remained absent from duties.  

Poor quality of services: Public sector hospitals especially in rural areas very commonly offer poor quality of services due to the above-mentioned deficiencies. Although social, economic and cultural factors affect ANC, other factors are also responsible for poor delivery of services. Shortage of healthcare providers is also responsible. Other barriers include commodities/logistics (drugs and non-drug consumables and medical equipment), skilled human resources, appropriate technology and the capacity to handle maternity cases. Availability of accessible emergency obstetric services (such as parenteral oxytocics, antibiotics and anticonvulsants, assisted deliveries, manual extraction of the placenta, blood transfusions, etc) are mandatory for the continuum of quality maternity healthcare. 

Doctor-nurse hierarchy: Nearly three-fourth of the participants stated that many doctors at primary health centers did not follow evidence-based guidelines and argued with the nurses who followed these guidelines. Many participants reported that doctors were rude and disrespectful towards nurses. 

Corruption: About half of the participants in few studies disclosed multiple types of corruption practices affecting patient care. Several reported that nurses collect money directly from patients for conducting deliveries. Some participants reported that even ASHA workers received financial incentives to refer patients to nursing clinics than referring to the nearest district hospital. 

Preference for male newborn baby: Many participants reported that in Bihar people prefer male newborn baby and hence they neglect female newborn baby, threaten nurses and pressurize them to not resuscitate female newborns. 

Other barriers: Administrative support to manage supplies and equipments could be a major factor for improving care. Nursing supervision and feedback can improve care at primary health centers as is evident by mobile nurse mentor training programme. 

Social and political issues related to delivery of healthcare in rural India: The Medical Council of India (MCI) has observed that Indian medical graduates are neither competent nor willing to work in rural healthcare delivery system. Vision document of 2015 by MCI also observed that poor communication skills and attitudes are responsible for poor quality of services at hospital. The new curriculum of MCI is being implemented from August 2019. This will incorporate foundation course. This may help to obtain better medical graduates after a few years who will have better skills, which will improve the quality of services in rural healthcare delivery system. 

Political will is a critical factor responsible for healthcare delivery. The government refuses to offer even a modest increase in the budget for rural healthcare which demonstrates a lack of political commitment to the welfare of the general population. 

What are the solutions for these challenges? 

Preventive aspect is critical for health for all. If we can provide safe water supply, sanitation, food and education to the entire population, it will improve health outcomes. If the patient workload will decrease, then the quality of care will definitely improve. 

Strengthening of infrastructure and human resources: India has one of the largest peripheral health delivery systems in the world. Paramedical personnel and nurses are the key healthcare providers in rural India. Improving supplies and additional incentives may be motivating factors for peripheral health workers. 

Institutional policy review: Monthly review and feedback of all stakeholders are important. Since each setting has its own challenges, a common policy will not solve these problems and individual solutions are needed at the local level. 

There is an urgent need to provide better living and working conditions in peripheral areas. Accommodations should be provided with better infrastructures to encourage doctors and nurses to serve rural areas. 

Training a large number of paramedical personnel or reviving licentiate courses are important to fill the gap in the availability of primary level healthcare. 

All the vacancies of doctors and paramedical staff should be filled with positive administrative efforts.
The local communities, peoples organizations, and representative bodies should be involved in ‘the planning, organization, operation and control of primary healthcare, making fullest use of local, national and other available resources’ in the true spirit of the ‘primary health care’ as enunciated in the Alma Ata Declaration of 1977.\cite{21}

**Conclusion**

This review identified many evidences for barriers and facilitators of maternal care. Health system strengthening coupled with strong political will and community mobilization are some of the strategies needed to improve health system. Community awareness is also important for antenatal, natal, postnatal and neonatal care. Involvement of local NGOs, leaders, government and panchayat will improve the social issues.

**Conflict of Interest:** None.

**Ethical Clearance:** it should be not applicable as it is a review article.

**Source of Funding:** NA

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Role of Color Doppler in Fetal Growth Restriction & Its Fetal Outcome: A Prospective Study

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Abstract

Objectives: To study the role of Color Doppler in FGR and fetal outcomes.

Methodology: The study was carried out on 100 antenatal females in their third trimester with IUGR by using color Doppler of various arteries. These patients were followed up & the perinatal outcomes were recorded.

Results: Out of 100 clinically suspected FGR cases, 41 were healthy baby, 4 were intrauterine deaths, 3 were neonatal deaths, 52 were admitted in NICU in which 25 cases were in respiratory distress & 3 cases were on mechanical ventilator. Out of 100 cases, 64 were spontaneous vaginal delivered, 14 were delivered by induction & 22 cases delivered by caesarean section.

Conclusion: Abnormal Doppler waveform changes indicate adverse perinatal outcome of pregnancies with FGR. Doppler study helps to reduce perinatal mortality & morbidity by timely & appropriate interventions.

Keywords: IUGR, Ductus Venosus, Color Doppler, Constitutionally small, Umbilical artery (UA), Middle Cerebral artery (MCA).

Introduction

FGR is defined as a fetal growth less than 10th percentile for the gestational age. The IUGR may be symmetric & asymmetric¹. About 70 percent of fetuses with a birth weight below the 10th centile for gestational age are constitutionally small & remaining 30 percent, the cause of IUGR is pathological².

IUGR is an indicator of the increased risk of perinatal & long term mortality & morbidity. IUGR is the consequence of abnormal condition. Factors like placental insufficiency, maternal hypertension, cardiovascular disease, diabetes, infection, low socioeconomic status, previous history & preeclampsia are some of the known risk factors for IUGR³.

The 1st application of Doppler velocimetry in obstetricians was reported by Fitzgerald & Drumm & McCallum et al. The significance of Doppler ultrasound in evaluating pregnancies that have the risk for FGR has become indispensable⁴, ⁵.

There are two major categories of FGR: Symmetrical & asymmetrical. Asymmetrical FGR is more common(70%). In asymmetrical FGR, there is restriction of weight followed by length. The head continues to grow at normal or near-normal rates(head sparing). Symmetrical FGR is less common (20-30%). It is commonly known as global growth restriction & indicates that the fetus has developed slowly throughout the duration of the pregnancy & was thus affected from a very early stage.

The umbilical artery (UA) Doppler ultrasound in the second trimester in high risk pregnancies could be used to predict the development of IUGR later in the pregnancy. UA Doppler can be used in the management & follow up of the fetuses with IUGR. The pattern of changes in the UA Doppler velocimetry can further
predict the fetal outcome.

Ductus venosus (DV) Doppler is the strongest single Doppler parameter that predicts the short-term risk of fetal death in early onset FGR & it has been shown to become abnormal only in advanced stages of fetal compromise & shown to have good correlation with cord acidemia & perinatal mortality.

**Materials & Method**

This is a prospective observational study on 100 patients which was conducted in department of Obstetrics & Gynaecology of Saraswathi Institute Of Medical Sciences, Pilkhuwa, Hapur.

Inclusion Criteria-
- Gestational age beyond 28 weeks or more.
- Singleton pregnancies with fundal height less than period of gestation by 4 weeks or more.
- Excellent dates & good dates.

Exclusion Criteria-
- Congenital malformation of fetus.
- Oligohydramnios.
- Poor dates.
- Multifetal pregnancies.
- Informed consent was obtained from the women who underwent color Doppler study. Studies of various arteries was performed using Color Doppler ultrasound with 3.5MHz curvilinear probe. To use Doppler velocimetry, patients were first scanned in the routine fashion using B-mode. Then, the vessels of interest were confirmed by Color Doppler. The Doppler signal was then obtained by placing the Doppler gate directly over the vessel of interest.

After delivery birth weight (immediately within six hours) was measured on an electronic machine, APGAR score after one & five minutes of birth. Baby anthropometry i.e. length, head circumference, abdominal circumference, upper segment & lower segment ratio were measured.

**Results**

**Table-1. Common Etiologies of IUGR.**

<table>
<thead>
<tr>
<th>Etiologies</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>25</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Rh Incompatibility</td>
<td>4</td>
</tr>
<tr>
<td>Intrauterine Infection</td>
<td>12</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>17</td>
</tr>
<tr>
<td>Placental Infarcts</td>
<td>1</td>
</tr>
<tr>
<td>Placenta Praevia</td>
<td>2</td>
</tr>
<tr>
<td>Fetal anomalies</td>
<td>5</td>
</tr>
<tr>
<td>Others/Idiopathic</td>
<td>33</td>
</tr>
</tbody>
</table>

In our study, the most common etiologies are idiopathic i.e. 33%, 25% cases are hypertensive, malnutrition contributes to 17%, 12% are intrauterine infection.

**Table-2. Maternal characteristics of study population.-**

<table>
<thead>
<tr>
<th>Parity</th>
<th>No. of cases (n=100)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primipara</td>
<td>52</td>
<td>52%</td>
</tr>
<tr>
<td>Multipara</td>
<td>48</td>
<td>48%</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous vaginal</td>
<td>64</td>
<td>64%</td>
</tr>
<tr>
<td>Induced</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td>C.S.</td>
<td>22</td>
<td>22%</td>
</tr>
<tr>
<td>Indication of C.S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal distress</td>
<td>9</td>
<td>40.9%</td>
</tr>
<tr>
<td>Sev. Preeclampsia</td>
<td>03</td>
<td>13.6%</td>
</tr>
</tbody>
</table>
In our study, out of 100 cases of high risk, abnormal Uterine artery indices were seen in 44 cases among which Uterine artery diastolic notch with increased Doppler indices was seen in 8 cases, while the rest(36) showed only abnormal Uterine artery PI with no diastolic notching.

All the 8 patients showing early diastolic notching resulted in poor outcomes, suggesting a high degree of positive predictive value of persistence of diastolic notching in late pregnancy for predicting unfavourable outcome. The findings in the present study suggest that the increased Doppler indices in Uterine artery with associated diastolic notch & persistence of diastolic
notch after 26 weeks constitute a warning sign & indicate the requirement of timely & intense fetal surveillance & intervention.

Table 4. Predictive value of Doppler study for detecting Abnormal fetal outcome.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Doppler Indices</th>
<th>No. of findings</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Predictive value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TP</td>
<td>FP</td>
<td>TN</td>
<td>FN</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>UA</td>
<td>35</td>
<td>7</td>
<td>6</td>
<td>52</td>
</tr>
<tr>
<td>2.</td>
<td>UMA</td>
<td>55</td>
<td>5</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>3.</td>
<td>MCA</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>83</td>
</tr>
<tr>
<td>4.</td>
<td>C/U RATIO</td>
<td>58</td>
<td>1</td>
<td>8</td>
<td>33</td>
</tr>
</tbody>
</table>

TP-True positive, FP-False positive, TN-True negative, FN-False negative.

The sensitivity of Uterine artery Doppler in identifying fetal outcome in the present study was sensitivity of 40.2% with a specificity 46.1%, a positive predictive value of 83.3 & a negative predictive value of 10.3.

In our study, in the high risk group with abnormal Umbilical artery Doppler indices (52 cases), 38 cases had reduced end diastolic velocity in Umbilical artery flow in umbilical artery flow velocity waveforms, out of whom 29 cases had abnormal fetal outcome.

The sensitivity of Middle Cerebral artery indices in identifying adverse fetal outcome in the present study was sensitivity of 5.68% with a specificity of 66.6%, a positive predictive value of 55.5% & a negative predictive value of 8.79%.

Table 5. Correlation of Mean baby weight with no. of arteries involved in AGA* babies.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>No. of arteries involved</th>
<th>Mean baby weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6</td>
<td>5</td>
<td>2.50</td>
</tr>
<tr>
<td>2.</td>
<td>10</td>
<td>4</td>
<td>2.64</td>
</tr>
<tr>
<td>3.</td>
<td>28</td>
<td>3</td>
<td>2.75</td>
</tr>
<tr>
<td>4.</td>
<td>23</td>
<td>2</td>
<td>2.85</td>
</tr>
<tr>
<td>5.</td>
<td>33</td>
<td>1</td>
<td>2.96</td>
</tr>
</tbody>
</table>

*AGA-appropriate for gestational age.

Discussion

Doppler imaging is of value for monitoring the pregnancy because it provides indirect evidence of fetal compromise. Numerous studies support the value of Doppler waveform indexes of the Umbilical artery & perhaps of fetal cerebral arteries for assessing the prognosis of foetuses with IUGR. In particular, frequencies of Caesarean section for fetal distress, admission to neonatal intensive care unit & perinatal mortality are all twofold to fourfold higher in growth retarded foetuses with abnormal Umbilical artery waveform than in those with normal waveform.

In our group of patients, 52 patients were primipara associated with IUGR. In our study, in the high risk group with abnormal Umbilical artery Doppler indices (52 cases), 38 cases had reduced end diastolic velocity in Umbilical artery flow, out of whom 29 cases had abnormal fetal outcome. The sensitivity of Middle Cerebral Artery indices in identifying adverse fetal outcome in the present study was sensitivity of 5.68%
with a specificity of 66.6%, a positive predictive value of 55.5% & a negative predictive value of 8.79%.

**Conclusion**

The findings in the present study thus suggest that Doppler flowmetry is a useful method for the prediction of IUGR in high risk pregnancies. Abnormal Doppler waveform changes indicate adverse perinatal outcome of pregnancies with FGR. Doppler study helps to reduce perinatal mortality & morbidity by timely & appropriate interventions.

Numerous studies support the value of Doppler waveform indexes of Umbilical artery & perhaps of fetal Cerebral arteries for assessing the prognosis of foetuses with IUGR. Elevation of the Umbilical artery Systolic/Diastolic ratio or of the pulsatility index is a moderately accurate predictor of adverse outcome in growth-retarded foetuses. In particular, the frequencies of Caesarean section for fetal distress, admission to neonatal intensive care unit & perinatal mortality are all twofold to fourfold higher in growth retarded foetuses with abnormal Umbilical artery waveforms than in those with normal waveforms.

**Conflict of Interest**: None declared

**Source of Funding**: Self

**Ethical Clearance**: the study was approved by the Institutional Ethics Committee

**References**


Assessment of Sleep Hygiene among School going Adolescents in Chennai

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Abstract

Aim:- Adolescence is a transition phase and good sleep is required for better academic performance and good health. Recent lifestyle modifications have increased the prevalence of sleep disorders among adolescents. Hence, current study aims to assess sleep hygiene among school going adolescents in Chennai.

Methods:- The study was conducted among 132 school going adolescents in Chennai between the age group 15-19yrs. Sleep habits were assessed using general questionnaire and sleep hygiene was assessed using Epworth Sleepiness Scale for Children and Adolescents (ESS-CHAD).

Results:- The overall prevalence of excessive daytime sleepiness was found to be 23.5%. 80.2% were found to sleep less than the required duration and 74.2% reported of sleepiness during morning sessions.

Conclusion:- There is a lack of sleep hygiene among school going adolescents in Chennai. Adolescents should be taught about the importance and benefits of good nocturnal sleep for a healthy future.

Keywords:- Adolescents, Sleep hygiene, Excessive Daytime Sleepiness (EDS)

Introduction

Adolescence is a transition period between childhood and adulthood, and has been identified as high period of storm and stress during an individual’s life. WHO has defined Adolescence as ‘period between 10-19yrs of age in an individual’s life’¹. Adolescence has been divided in to early (10-14yrs) middle (15-17yrs) and late adolescence (17-19yrs). Adolescence is associated with increased and varied Physical, mental and social changes¹.

Sleep is a Physiological process which is required for good physical, mental and social well being². Sleep requirement varies across ages and adolescents require a nocturnal sleep of 9.2 hrs per day³. A good sleep is required for good health and compromise in sleep quantity or quality increases risk of cardiovascular disorders and other metabolic disorders. In recent days due to lifestyle modifications there is an increased prevalence of sleep disturbances among general population¹. As adolescents are facing enormous pressure by means of academics and various internal and external factors prevalence of sleep disturbances among adolescents is also in rise. Also sleep is required for memory consolidation which is indispensable especially for adolescents for their better academic performance⁴. Adolescence is the phase where an individual will be in the peak of their school education and any disturbance in sleep would affect their health and academic performance, which would ultimately affect their higher education and career. Hence, assessment of sleep hygiene among adolescents becomes need of the hour and the current study proposes to assess the sleep hygiene among school going adolescents in Chennai.
Material and Method

Study participants:-

The current study is a cross sectional study and was initiated after obtaining clearance from the institutional ethics committee. The school was chosen using computer randomization software from the school directory list of the Urban Corporation. Participants were healthy male (84) and female (48) school going adolescents between the age group 15-19yrs (n-132). Participants with sleep disorders, metabolic disorders or any neuro-psychiatric disorders were excluded and those who are healthy and gave consent were included.

Study tools:-

General details and sleep habits of the participants were collected using questionnaire and sleep hygiene of the participants was assessed used Epworth Sleepiness Scale for Children and Adolescents (ESS-CHAD) after obtaining permission from the questionnaire authors. Epworth Sleepiness scale assesses sleep hygiene through Excessive Daytime Sleepiness (EDS) of an individual. Excessive daytime sleepiness is a condition where an ‘individual would be asleep when expected to be awake’. EDS is a symptom of compromised sleep hygiene, Hence, assessment of EDS would reveal sleep hygiene of an individual.

ESS consists of 8 different situations and the adolescent score his/her chances of dozing from a scale of 0-3 where 0 indicates no chances of dozing, 1 indicates slight chances of dozing, 2 indicates moderate chances of dozing and 3 indicates severe chances of dozing respectively. A total score of > 10 indicates EDS in an individual - thus compromised sleep hygiene.

Study procedure:-

The study procedure was explained and written permission was obtained from the school authorities. Informed consent form was distributed to the students two days before the day of data collection and informed consent was obtained from the parents and assent was obtained from the participants. General questionnaire and ESS-CHAD was explained to the participants and they were asked to rate their chances of dozing from a scale of 0-3.

Statistical Analysis:-

The data were tabulated and analyzed using SPSS software version 21.0. Descriptive statistics was calculated for the background variables. Categorical variables were described as percentage.

Findings

The current study was conducted 136 participants and due to incomplete responses 4 were excluded and responses of 132 participants were considered for analysis. Among 132 participants mean age was found to be 15.56 ± 0.75. Gender wise 63.6% were males and 36.4% were females. Highest percentage of study population (38.6%) belongs to the board exam appearing class. (Table 1)

Table 1: Demography of the study Participants

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age distribution (yrs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>77</td>
<td>58.3</td>
</tr>
<tr>
<td>16</td>
<td>38</td>
<td>28.8</td>
</tr>
<tr>
<td>17</td>
<td>15</td>
<td>11.4</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>Gender distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>84</td>
<td>63.6</td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>36.4</td>
</tr>
<tr>
<td>Class distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>28</td>
<td>21.2</td>
</tr>
<tr>
<td>10</td>
<td>51</td>
<td>38.6</td>
</tr>
<tr>
<td>11</td>
<td>37</td>
<td>28.0</td>
</tr>
<tr>
<td>12</td>
<td>16</td>
<td>12.1</td>
</tr>
</tbody>
</table>

Table 2: Sleep pattern of the study participants

<table>
<thead>
<tr>
<th>Questions</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-10 PM</td>
<td>54</td>
<td>41</td>
</tr>
<tr>
<td>10-12 AM</td>
<td>76</td>
<td>57.4</td>
</tr>
<tr>
<td>12-2 AM</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Sleep duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-5 hrs</td>
<td>8</td>
<td>6.2</td>
</tr>
<tr>
<td>6-8 hrs</td>
<td>106</td>
<td>80.2</td>
</tr>
<tr>
<td>9-10 hrs</td>
<td>18</td>
<td>13.6</td>
</tr>
<tr>
<td>Sleepiness in Morning sessions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>98</td>
<td>74.2</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>25.8</td>
</tr>
</tbody>
</table>
The mean bed time of the participants was 10.50±0.83 and mean sleep duration was 7.27±1.27. 74.2% of the participants reported of sleepiness in the morning sessions (Table 2).

![EDS Prevalence](image)

**Fig 1. EDS prevalence among adolescents**

**Prevalence of EDS:**

The overall prevalence of Excessive Daytime Sleepiness (EDS) was found to be 23.5%. (Total score >10). Due to uneven distribution of the sample size gender difference in EDS was not analyzed (Fig.1)

**Table 3: Dozing pattern in different situations**

<table>
<thead>
<tr>
<th>Situations</th>
<th>No Dozing (%)</th>
<th>Mild Dozing (%)</th>
<th>Moderate Dozing (%)</th>
<th>Severe Dozing (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td>30.3</td>
<td>53.8</td>
<td>10.6</td>
<td>5.3</td>
</tr>
<tr>
<td>Watching TV</td>
<td>67.4</td>
<td>22.0</td>
<td>9.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Sitting inactive in a public place</td>
<td>78.8</td>
<td>14.1</td>
<td>4.5</td>
<td>2.3</td>
</tr>
<tr>
<td>As a passenger in car for an hour</td>
<td>24.2</td>
<td>32.6</td>
<td>23.5</td>
<td>19.7</td>
</tr>
<tr>
<td>Lying down in afternoon</td>
<td>24.2</td>
<td>16.7</td>
<td>28.0</td>
<td>31.1</td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td>81.1</td>
<td>14.4</td>
<td>1.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Sitting quietly after lunch</td>
<td>40.9</td>
<td>27.3</td>
<td>13.6</td>
<td>18.2</td>
</tr>
<tr>
<td>While doing Homework</td>
<td>37.9</td>
<td>37.1</td>
<td>11.4</td>
<td>13.6</td>
</tr>
</tbody>
</table>

 Indicates highest prevalence of dozing
Discussion

The current study assessed the sleep hygiene of school going adolescents in Chennai. Majority of the adolescents of the study belong to the board exam appearing class and their average sleep duration was lesser than the required sleep duration. Due to reduction in nocturnal sleep duration most of the participants have reported of sleepiness in the morning sessions thus showing a compromise in sleep hygiene.

Excessive Daytime Sleepiness (EDS) among the adolescents was found to be 23.5%, which is lesser than a study reported from south India. Studies have also shown that sleep quality is diminishing among adolescents universally and even more diminishing in adolescents of developing countries. In current study sleep duration among study participants was found to be lesser than the required duration. School going adolescents are exposed to extended classes, academic loads and achievement pressure along with age related psycho-physiological pressures. These physical and mental factors could disturb the sleep quality and quantity, making prone for EDS.

Dozing was not much reported by the participants for most of the questions, but mild dozing was reported during reading and travelling as a passenger in car. Moderate dozing pattern was reported while lying in the afternoon. Severe dozing pattern was not reported for any of the questions.

EDS reflects poor sleep hygiene and is associated with negative health. In EDS there will be increased level of daytime sympathetic activity thus increasing the level of inflammatory mediators such as TNF α and IL-6. Chronic elevation of these inflammatory mediators makes the adolescents more prone for metabolic disorders such as Type II Diabetes Mellitus, hypertension, early coronary artery disease. Also poor sleep hygiene is associated with increased stress, poor academic performance, absenteeism, irritability, cognitive deficit and decreased quality of interpersonal relationships. Thus compromised sleep hygiene impairs physical, mental and social well being of adolescents.

Conclusion

The current study shows that sleep duration is less and EDS prevalence is high among school going adolescents in Chennai. Both these factors are associated with poor sleep hygiene. Hence, in order to improve sleep hygiene of adolescents, importance and benefits of good sleep should be taught to them for better academic performance and overall good health.

Conflict of Interest: No conflict of interest

Source of Funding: Self funding

Ethical Clearance: Institutional ethics committee (IEC) clearance obtained.

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Study of Hernias of Anterior Abdominal Wall of Andrapradesh

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Abstract

93 adult patients of hernias (60 males and 33 females) aged between 30 to 70 years patients were studied. 27(29%) had umbilical 17(18.2%) had para – umbilical 11(11.8%) had epigastrium 38(40.8%) had inguinal hernia. The base line manifestation of hernia were 15(16%) were alcoholic 11(11.8%) had cough due to smoking 17(18.2%) had diabetes mellitus. 12(12.9%) had coronary disease, 7(7.5%) were tobacco chewers, 10(10.7%) were obese, 9(96%) had constipation, 12(12.9%) had constipation, clinical manifestations were 25(26.8%) had welling, 19(20.4%) had pain, 23(24.7%) had abdominal distention, 9(9.6%) had irreducible hernia, 4(43%) had vomiting, 6(6.4%) had strangulation, 7(7.5%) had intestine obstruction. Post operative infections were 11(11.8%) wound infections in anatomical group 7(7.5%) wound infections in mesh repair 9(9.6%) had seroma in anatomical repair, 5(5.3%) had seroma in mesh repair, recurrence of different hernias in anatomical repair a. 2(2.1%) in paraumbilical, 4(4.3%) umbilical, 1(1%) epigastrium 5(5.3%) in inguinal. In the mesh repair, b) 1(1%) paraumbilical, 2(2%) umbilical, 3(3.2%) inguinal. This study of different hernias of anterior abdominal wall with various clinical manifestation post surgical infections, recurrence of hernia will be quite useful to surgeons to treat the different hernias meticulously and prevent morbidity and mortality because strangulated and obstructive hernia need emergency treatment to avoid mortality of the patients.

Keywords- DM = Diabetic Mellitus HTN= Hypertension. Mesh repair seroma.

Introduction

Hernias of the anterior abdominal wall are very common surgical condition affecting all ages and both sexes. It is an abnormal protrusion of peritoneal lined sac through the muscular covering of the abdomen. Most common symptoms of hernia include swelling, heavy feeling of abdomen, and discomfort in the abdomen regions, especially when coughing. Lifting, or bending over. However, symptoms may not appear in some people and they will only realize that they have hernia during medical check-up. The hernia can also be characterized as a rupture in smooth tissue through which an organ protrudes or pushes through.

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Material and Method

93 adult patients (60 males and 33 females) aged between 30 to 70 years regularly visiting General surgery department GSL Medical college hospital Rajahmundry-533296. (Andrapradesh) selected for study. Radiological (USG and CTScan) was done to confirm the hernia and blood investigation was done to study the co-morbidity of the patients. Detail history of each patients was
recorded small defects of hernia were sutured and large and wide were closed by mesh repair

The herniated patients with HIV, malignancy, gangrenous hernia pregnant females, were excluded from the study. The duration of the study was about four years. (2014 to 2018)

**Observation and Results**

**Table-1: Prevalence of types of hernia**

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Types of Hernia</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Umbilical</td>
<td>27</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Para-umbilical</td>
<td>17</td>
<td>18.2</td>
</tr>
<tr>
<td>3</td>
<td>Epigastrium</td>
<td>11</td>
<td>11.8</td>
</tr>
<tr>
<td>4</td>
<td>Inguinal hernia</td>
<td>38</td>
<td>40.8</td>
</tr>
</tbody>
</table>

**Table-2: Age wise classification of hernia**

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Age group</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30-40</td>
<td>19</td>
<td>20.4</td>
</tr>
<tr>
<td>2</td>
<td>41-50</td>
<td>25</td>
<td>26.8</td>
</tr>
<tr>
<td>3</td>
<td>51-60</td>
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</tr>
<tr>
<td>4</td>
<td>61-70</td>
<td>10</td>
<td>10.7</td>
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</table>

**Table-3: Base line manifestation of hernia**

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Particulars</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alcohol</td>
<td>15</td>
<td>16.1</td>
</tr>
<tr>
<td>2</td>
<td>Smoker (cough)</td>
<td>11</td>
<td>11.8</td>
</tr>
<tr>
<td>3</td>
<td>DM</td>
<td>17</td>
<td>18.2</td>
</tr>
<tr>
<td>4</td>
<td>Coronary artery disease</td>
<td>12</td>
<td>12.9</td>
</tr>
<tr>
<td>5</td>
<td>Tobacco chewer</td>
<td>7</td>
<td>7.5</td>
</tr>
<tr>
<td>6</td>
<td>Obesity</td>
<td>10</td>
<td>10.7</td>
</tr>
<tr>
<td>7</td>
<td>Constipation</td>
<td>9</td>
<td>9.6</td>
</tr>
<tr>
<td>8</td>
<td>HTN</td>
<td>12</td>
<td>12.9</td>
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</tbody>
</table>

**Table-4: Clinical manifestation of anterior abdominal hernia**

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Age group</th>
<th>No</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>1</td>
<td>Swelling</td>
<td>25</td>
<td>26.8</td>
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<td>2</td>
<td>Pain</td>
<td>19</td>
<td>20.4</td>
</tr>
<tr>
<td>3</td>
<td>Abdominal distention</td>
<td>23</td>
<td>24.7</td>
</tr>
<tr>
<td>4</td>
<td>Irreducible</td>
<td>9</td>
<td>9.6</td>
</tr>
<tr>
<td>5</td>
<td>Vomiting</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>6</td>
<td>strangulation</td>
<td>6</td>
<td>6.4</td>
</tr>
<tr>
<td>7</td>
<td>Intestinal obstruction</td>
<td>7</td>
<td>7.5</td>
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</table>

Table-2 Age wise classification of hernia 19(20.4%) were aged between 30-40 year 25(26.8%) were between 41-50, 39(41.9%) were between 51-60 years

Table-3 Base line manifestation of hernia 15(16.1%) were alcoholic, 11(11.8%) had cough due to smoking, 17(18.2%) were diabetes mellitus (type –II DM) 12(12.9%) had coronary diseases. 7(7.5%) were Tobacco – chewers 10(10.7%) were obese 9(9.6%) had constipation, 12(12.9%) had Hyper tension (HTN)

Table-4 clinical manifestation of anterior abdominal wall – 25(26.8%) had swelling, 19(20.4%) had severe
The clinical manifestations were 25(26.8%) had swelling 19(20.4%) had pain, 23(24.7%) had abdominal distention, 9(9.6%) had irreducible hernia 4(4.3%) had vomiting, 6(6.4%) had strangulation 7(7.5%) had intestinal obstruction (Table-4) post operative infections were 11(11.8%) wound infections in anatomical group, 7(7.5%) wound infections in mesh repair, 9(9.6%) seroma in anatomical group, 5(5.3%) seroma mesh repair (Table-5) recurrence of different hernia in anatomical repair 2(2%), paraumbilical 4(4.3%) umbilical 1(1%) epigastrium 5(5.3%) Inguinal In mesh repair 1(1%) was para-umbilical 2(2.1%) umbilical, 3(3.2%) Inguinal recurrence was noted (Table-6) These obtained values were more or less in agreement with previous studies. (5)(6)(7)

The associated risk factors can be weakness of abdominal wall which contributes to hernia and increased abdominal pressure which can cause hernia contributing factors can be anatomical, congenital, connected with the sex, age weight gain, injury, post – operative scar, etc Causative , factors can be obstructive uropathy, ascitis, cirrhosis of liver, portal HTN etc. DM, obesity, alcoholism, smoking were main causative factors for post surgical infections and recurrence of hernia(10) moreover deposition of adipose tissue differs between genders and perhaps this contributes to gender differences in hernia formation therefore obesity, physical strain, pregnancy are important etiological factors in the development of abdominal hernia

### Summary and Conclusion

The present study of prevalence of abdominal hernia in Andrapradesh population will be quite useful for ideal approach and treat. Early diagnosis easily accessible health facilities and health education are important to prevent complication. New modality of treatment should be adopted as the standard choice of care to prevent recurrence but this study demands further patho – physiological, genetic, nutritional, neuro- muscular study to throw more light upon herniation because little is known about the pathophysiology of intrabdominal pressure in adaptation of erect posture

This research paper was approved by ethical committee of GSL medical college and hospital Rajahmundry – 533296 (Andrapradesh)

No Conflict of Interest
References

Alzheimer’s Disease: Causes, Treatment Methods and Current Perceptions

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Abstract
This report provides latest information and different ways and methods for diagnosing and treating Alzheimer’s disease (AD). It also includes history, prevalence and incidence rates, and therapeutic drugs for AD. In therapeutic research, many drugs, namely tramiprosate, tarenflurbil, bapineuzimab, donepezil and memontine etc are developed to prevent the formation of plaques and neurofibrillary tangles which are the major causes for Alzheimer’s disease. Many organizations and committees are still providing funds and promoting research on diagnosis and treatment methods for AD. The prevalence rate is increasing exponentially against age and it is increasing rapidly after 65 years of age, whereas there are 24.2 million people suffering with AD and in 4.2 million persons the disease is getting incident every year.

Keywords: Alzheimer’s disease, Treatment, Biomarkers, Neuropathology, Epidemiology.

Introduction
In the year 1901, on Nov-25, a woman by name Auguste was admitted to a hospital in Frankfurt and examined by a German psychiatrist Alois Alzheimer. She had symptoms like reduced compression and memory, aphasia, disorientation, unpredictable behavior, paranoia, auditory hallucinations and pronounced psychosocial impairment. Alzheimer continued taking her case until her death on April 8, 1906. Later on, he started studying about neuropathological disorders. In 1906, Nov-4, Alzheimer described about patient Auguste, her symptoms, and behavioral changes during the course of the disease. At necropsy, there were plaques and neurofibrillary tangles. Later on, his name Alzheimer came into usage which indicates the largest cause of primary dementia.

Auguste and her case history file:
The following is taken from Alzheimer’s case history file from Auguste D.

“She is quite cooperative during her physical examination process. But once during this physical examination process she asked about a child who was called by someone else. she know that it was Mrs.Twin. Later she screamed, became nervous and at the end she repeatedly said I will not be cut. I do not cut myself”. After her death, Alzheimer examined her brain and found clumps of proteins and tangles in neuronal cells. Alzheimer reported his research findings in a lecture entitled “A characteristic disease of the cerebral cortex”; there after researchers started focusing on this disease.

Epidemiology
In the year 2005, Alzheimer Disease international commissioned an international group of experts to estimate the prevalence and incidence rate of dementia which leads to Alzheimer’s disease. According to the report, nearly 24.2 million people were suffering from dementia and 4.6 million new cases arising every year. The prevalence rate is increasing exponentially against age and it is highly increasing after 65 years (Fig. 1).
Cause of Alzheimer disease:

Role of genes

Role of genes on AD was first reported by Glenner and Wong, 1984 by predicting AD gene on chromosome 21. It has been reported that nearly 90 % of the AD patients were sporadic. AD is primarily caused by the overproduction of amyloid-β (Aβ) peptides in the brain, owing to the mutations in either the APP gene or genes encoding presenilin 1 (PSEN1) or presenilin 2 (PSEN2). Presenilin is the core proteins in the gamma secretase complex, which is responsible for the cleavage and release of Aβ. Based on the age of onset, AD can be classified into two types: early-onset AD (EOAD) and later-onset AD (LOAD). For late-onset Alzheimer’s disease, a polymorphism for apolipoprotein E (ApoE) on chromosome 19 has been found to affect the risk of Alzheimer’s disease. ApoE gene code helps in carrying the cholesterol in the bloodstream. ApoE comes in different forms, commonly referred as alleles, most frequently occurring alleles are: apoE2, apoE3 and apoE4. One or more copies of apoE4 increases the risk of getting AD, because of the efficient binding process of apoE4 which enhances the deposition of the Aβ peptide.

Retromer deficiency

Retromer is a multi-subunit complex associated with the cytosolic face of endosomes and mediates retrograde transport of transmembrane proteins from endosomes to the trans-Golgi network. Retromer deficiency causes hippocampal dysfunction, neurodegeneration and accumulation of beta-amyloid leading to AD. The memory which is dependent on hippocampus get damaged in LOAD (Late Onset of AD) is due to accumulation of soluble and insoluble beta-amyloid. Soluble beta-amyloid is neurotoxic. After various studies on mice, Muhammad, Flores was observed that retromer deficiency express human wild-type amyloid precursor protein (APP) and human-site APP-cleaving enzyme (BACE) which leads to accumulation of beta-amyloid and results in AD.

Tau’s hypothesis

Tau is protein. The tau’s hypothesis proposes that the tau protein abnormalities initiate the disease cascade. In this model, hyperphosphorylated tau begins to pair with other threads of tau. Eventually, they form neurofibrillary tangles inside nerve cell bodies and leads to microtubules disintegration, collapse the structure of cell’s cytoskeleton and neuron transport system. This may result first in malfunctions in biochemical communication between neurons and later in the death of the cells.

Amyloid cascade hypothesis

Beta-amyloid is a fragment of a larger protein “amyloid precursor protein-APP”. In 1991, the amyloid hypothesis postulated that extracellular amyloid β-peptide (Aβ) deposits (PLAQUES) are the fundamental cause of the disease. These plaques are called SENILE PLAQUES. Senile plaques are more complex; they consist of extracellular deposits of amyloid material and are associated with swollen, distorted neuronal processes called dystrophic neuritis finally leading to Alzheimer’s disease. Hardy and Selkoe reported that Aβ accumulation is the driving force of Alzheimer’s disease pathogenesis. The rest of the disease process like formation of neurofibrillary tangles is mainly attributed through the imbalance between Aβ production and Aβ clearance. According to this hypothesis, aggregation of beta-amyloid can disturb cell-to-cell communications and activate the immune cells, which lead to inflammation in brain cells. Numerous researchers inspired by Amyloid cascade hypothesis and brought clinical trials to test the medication to treat/reduce the course of Alzheimer’s disease, and to stop the formation of beta-amyloid plaques. The clinical trials on patients successfully removed the patient’s plaques, however, it didn’t show any clinical improvements beyond that. Hence it created the debate among researchers, whether the amyloid cascade hypothesis may be wrong (though it correlate the plaques but not with AD).
**Cholinergic hypothesis**

Cholinergic hypothesis proposed that degeneration of cholinergic neurons in the basal forebrain and the associated loss of cholinergic neurotransmission in the cerebral cortex and other areas contributed significantly to the deterioration in cognitive function seen in patients with Alzheimer’s disease.11

**Treatment methods for Alzheimer’s disease:**

U.S Food and Drug Administration (FDA) approved six drugs for treating Alzheimer’s disease temporarily, which can improve symptoms by increasing the number of neurotransmitters in the brain. These drugs show different impacts on different persons and are registered in clinicaltrials.gov which stands for National Institute of Health registry of publicly and privately funded clinical studies. It is well known that 244 drugs were tested through clinical trials during 2002-2012. Based on the clinical trial results, only one of the 244 drugs is successfully received FDA approval. The difficulty in the developing treatment for AD is high cost involved in drug development and requires more time to conclude the therapeutic effect of the drug. There are two approaches for treating AD: (i) beta-amyloid approach, and (ii) therapeutic treatment.

**Beta-amyloid**

**Decreasing beta-amyloid production:** The experimental drugs prevent those enzymes or proteins that help the formation of plaques from APP. Many scientists worked to identify those proteins. Of all the proteins beta secretase and gamma secretase were the primary proteins involved in this process. By inhibiting these proteins further formation of plaques can be prevented. Secretase inhibitors are that block the clipping action of secretases. Another class of drugs reduces beta-amyloid by changing the way secretases work or encouraging secretases, such as alpha-secretase, to cut APP into fragments other than beta-amyloid. Zhu, Wu12 demonstrated the Berberine (alkaloidal component of *Rhizoma coptidis*) could reduce the production of beta-amyloid by inhibiting the expression of BACE via activation of the ERK1/2 pathway.

**Preventing beta-amyloid aggregation:** As AD is due to the presence of amyloid plaques, scientists have explored drugs that can prevent beta-amyloid aggregation which is the most important way to treat Alzheimer’s Disease. Some studies suggest that the toxic effects of beta-amyloid occur before the formation of plaques and oligomers, so researchers are looking for ways to prevent the initial interactions between beta-amyloid and nerve cells that lead to toxicity.

**Increasing beta-amyloid removal:** Beta-amyloid is generated from APP by sequential cleavages by BACE-1 and the gamma-secretase complex. Research has been focused on developing drug molecule which could reduce the generation of beta-amyloid and its cellular toxicity.13 Methods to increase removal of beta-amyloid from the brain are,

- Mobilizing the immune system to produce antibodies to attack beta-amyloid,
- Administering laboratory-produced antibodies to beta-amyloid and
- Administering natural agents with anti-amyloid effects.

**Immune system-generated antibodies to beta-amyloid:** Experimental agents in this category are called “active vaccines.” These vaccines incorporate a beta-amyloid fragment that is attached to a carrier protein. When injected, the body should produce antibodies to attack beta-amyloid and reduce levels of beta-amyloid in the brain.

**Laboratory-produced antibodies to beta-amyloid:** Experimental drugs in this category are called “passive vaccines.” These vaccines may be safer because they can be given in predetermined doses and do not stay in the body after dosing ends.

**Natural agents with anti-amyloid effects:** Intravenous immunoglobulin (IVIg) contains a broad array of natural antibodies that may reduce beta-amyloid levels. IVIg is obtained from the plasma of human blood donors.

Therapeutic treatment for Alzheimer’s disease

In the last two decades, pharmaceutical industries were primarily focused on the developed of the effective AD drugs. Researchers followed different strategies and hypothesis to design the drug and met multiple failures of drug molecules in the clinical trials.14,15 Several medications are approved by the U.S. Food and Drug Administration (FDA) to treat the symptoms of AD
including Donepezil (Aricept), rivastigmine (Exelon), and galantamine (Razadyne) to treat mild to moderate Alzheimer’s; Donepezil, memantine (Namenda), and Namzaric (combination of memantine and donepezil) to treat moderate to severe Alzheimer’s. These drugs work by regulating neurotransmitters, the brain chemicals that transmit messages between neurons. These drugs may help the patient in maintaining their thinking, memory, and communication skills and help with certain behavioral problems. However, these drugs don’t change the underlying disease process. They are effective for some but not all people and may help only for a limited time.

**Cholinesterase inhibitors:**

Cholinesterase is a family of enzymes which catalyzes the hydrolysis of the neurotransmitter acetylcholine (ACh) into choline and acetic acid to allow a cholinergic neuron to return to its resting state after activation. These drugs work by boosting the level of cell-to-cell communication and by providing a neurotransmitter (acetylcholine) that is depleted in the brain by Alzheimer’s disease. Cholinesterase inhibitors can improve neuropsychiatric symptoms, such as agitation or depression, as well. Commonly prescribed cholinesterase inhibitors include donepezil (Aricept), galantamine (Razadyne) and rivastigmine (Exelon).

**Memantine (namenda):** Memantine is widely applied for many neurological disorders, including Alzheimer’s disease. Memantine was first synthesized in the 1960s and its therapeutic effect was observed only in 1970’s. The mechanism of action is blockade of current flow through the channels of N-methyl-D-aspartate (NMDA) receptors, which is a glutamate receptor subfamily broadly involved in brain function. Memantine drug works in another brain cell communication network and slows the progression of symptoms with moderate to severe Alzheimer’s disease.

**Bapineuzumab:** Bapineuzumab is the immunological approach of treating AD patients, its composed of humanized anti-Aβ monoclonal antibodies. This drug also showed similar results like tramiprosate and tarenflurbil.

**Creating a safe and supportive environment**

Creating good living facilities for AD patients is a part of the treatment. For few AD patients, reducing the brain challenging tasks will make life simple and easier. The below provided steps will help Alzheimer’s patients to some extent:

- Try to take regular appointments on the same day and same time weekly or monthly.
- Try to keep handrails wherever necessary so that you cannot slip or fall.
- Also wear comfortable shoes and slippers.
- Maintain only necessary number of mirrors to prevent confusions that occur due to opposite images.
- Always keep meaningful photographs and things on the walls of the house of the patient.
- Form your daily time table to do anything without forgetting them.
- Keep mobiles, purses and everything at a fixed place at home so that they cannot get lost.

**Exercise:** Regular is important for everybody for maintaining proper health—and it is highly important for people with AD. Daily walk is necessary for maintaining the proper functioning of joints, muscles and heart. Exercise can also promote restful sleep and prevent constipation. It is very important to wear some identification by an Alzheimer patient when he go outside for daily walking or any other purpose without company of known person to him.

**Nutrition:** People with AD may forget to eat, lose interest in preparing meals or not eat a healthy combination of foods. They may also forget to drink enough, leading to dehydration and constipation.

**Water, juice and other healthy beverages:** Try to ensure that a person with Alzheimer’s disease drinks at least several full glasses of liquids every day. Avoid beverages with caffeine, which can increase restlessness, interfere with sleep and trigger a frequent need to urinate.

Few nutritional foods are marketed as “medical foods” to treat the disease to some extent. But these medical foods are not approved by the food and drug administration because except the marketing claims those who are claiming to make use of these foods cannot show any information about the safety of these foods.

**Alternative medicine:** Herbal preparations and
vitamins can be used to prevent or delay AD. However, till date, there is no strong evidence that any of these therapies slow the progression of cognitive decline.

**Conclusion**

AD is mainly due to the formation of beta amyloid plaques, hyper phosphorylation of Tau protein and inhibition of cholinergic neurotransmitters. In therapeutic research many drugs were discovered to treat AD and its symptoms, but none of drug molecule shown precise result for AD. On the other hand, prevalence rate is highly increasing after 65 years. Neuropathological studies of AD reported that hyper phosphorylated tau protein by phosphate groups cause neuronal damage and even neuronal cell death. Even the beta amyloid plaques formed from APP by gamma and beta secretase enzymes is another major cause for AD. The diagnosis of AD can be done by MRI and PET scans or using SPECT, but complete diagnosis cannot be done using these scans. It takes few days or weeks for a diagnosis. The genetical studies of AD reported that APO E gene is responsible for the production of Amyloid Presursor Protein (APP) from which beta Amyloid plaques are formed. In treating Alzheimer’s disease, therapeutic research have high scope in future because beta secretase and gamma secretase enzymes should be inhibited to prevent the formation of plaques and prevention of hyperphorylations of Tau proteins.

**Ethical Clearance:** Not applicable.

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**Conflict of Interest:** Nil

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New Technologies and their Impact on Agriculture with Special Reference to Tamilnadu

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Abstract

Traditional technology is slowly giving way to modern technology. Technological change or the new strategy proposes to make a new technological breakthrough in India which comprises the introduction of new and HYV of improved seeds, increased application of the recommended dose of fertilizers and extension of the use of pesticides that can save crop from destruction by insects. This technological change brought spectacular changes in the agriculture production of our country. Agriculture provides direct livelihood to 59 per cent of the labour force in India. 35 per cent of India’s population below the poverty line lives in rural areas, and is directly or indirectly dependent on agriculture. The present study makes an attempt to analyse the impact of agriculture production in Tamil Nadu. By and large, the study concluded that small farmers are economically more efficient than large farmers irrespective of varieties of rice cultivation in the study area. This is indicated that apart from efficient allocation of inputs, direct supervision and farm management are crucial determinants of economic efficiency.

Keywords: Agriculture production, Technology Impact.

Introduction

Agriculture is the backbone of Indian economy as major chunk of population of the country is engaged and dependent on agriculture. It provides employment to large number of people, raw materials to industrial units and food for survival to all. The introduction of scientific farm technology during mid-sixties has increased the agricultural production and the country turned out from a position of deficit in food grain production to surplus one. Traditional technology is slowly giving way to modern technology.¹ This transformation to new technology and techniques brings to the fore new problems and thus offers new opportunities and new avenues of research to agricultural economists. The ‘New Strategy’ for agricultural development, which was initiated in 1966, in essence called for the implementation of High Yielding Varieties Programme (HYVP) in all districts selected under Intensive Agricultural District Programme (IADP) and allied schemes. Technological change or the new strategy proposes to make a new technological breakthrough in India which comprises the introduction of new and HYV of improved seeds, increased application of the recommended dose of fertilizers and extension of the use of pesticides that can save crop from destruction by insects. This technological change brought spectacular changes in the agriculture production of our country. The increase in production of food grains recorded after 1966-67 is described as Green Revolution. The rapid introduction of HYV of paddy and wheat and their multiplied effects on other crops justify the name Green Revolution. To study the characteristics of sample farmers, labour utilization, input and output structure, cost and returns for small and large farmers cultivating High Yielding Variety and Traditional Variety of rice. The production performance of the rice production is of critical importance in improving the efficient use of resources. The cost of production and net returns obtained per unit would determine the profitability of the rice production. The profitability of an enterprise depends upon the efficient

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use of the resources in production. The present study is a modest attempt in this regard.²

**Review of Literature**

Davis and Martinin their study,³ “The Relationship between Yields on Farm and in Experiments Station” was observed to vary according to the cultivation season. During good years, the yield at experiment station was found to increase more rapidly than the yield on farm within the same district. This was mainly because the farmers were more interested in measuring their profit by limiting their input investments, while the experimenters only aimed at measuring yield and had no cost restraints.

Francies, Tripathy in his study,⁴ “A Study of Technological Crop in Adoption of New Rice Technology in Coastal Orissa and Constraints Responsible in the same”, concluded that, about 17 per cent of the gap in the yield was caused by technology gap. The different package of practices individually accounts for the technological gaps. Nearly 20 per cent of the gap was due to the ecological factors like temperature, soil, rainfall and sunshine intensity.

**Objectives of the study**

To analyze the cost and return structure of Traditional and High Yielding Variety technology of and of small and large farmers producing Traditional and High Yielding Variety of rice.

To study the impact of new technology on factor shares and to measure the nature of factor biases in technical change.

**Statement of The Problem**

The new farm technology adopted since the mid sixties has helped in revolutionizing Indian agriculture. Technological change in agriculture is characterized by the use of pesticides, irrigation, machinery, improved implements, soil conservation and the like. The new agricultural strategy was the first to adopt modern inputs and derive the benefits as a sequel. The production performance of the rice production is of critical importance in improving the efficient use of resources.⁵ The cost of production and net returns obtained per unit would determine the profitability of the Agriculture production.

**Tools of Analysis**

Simple Regression

Dummy Variable

**Data Analysis**

**Table- 1: Agricultural Perspective In Tamilnadu**

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<td>(i) Net Sown Area</td>
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<td>141.0</td>
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<td>(ii) Gross Cropped Area</td>
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<td>182.2</td>
<td>190.6</td>
<td>197.2</td>
<td>203.4</td>
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<tr>
<td>(iii) Cropping Intensity</td>
<td>125.0</td>
<td>130.0</td>
<td>135.0</td>
<td>140.0</td>
<td>144.0</td>
</tr>
<tr>
<td>(iv) Gross Cropped area under foodgrains</td>
<td>126.7</td>
<td>1270</td>
<td>130.0</td>
<td>132.6</td>
<td>135.8</td>
</tr>
<tr>
<td>2. Irrigation (m.ha.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Foodgrains</td>
<td>44.2</td>
<td>53.8</td>
<td>62.3</td>
<td>70.2</td>
<td>77.7</td>
</tr>
<tr>
<td>(ii) Other than foodgrains</td>
<td>16.3</td>
<td>21.9</td>
<td>27.0</td>
<td>31.8</td>
<td>36.3</td>
</tr>
<tr>
<td>(iii) Total</td>
<td>60.5</td>
<td>75.7</td>
<td>89.3</td>
<td>102.0</td>
<td>114.0</td>
</tr>
</tbody>
</table>
TABLE-2: TECHNICAL BIAS IN HIGH YIELDING VARIETY (HYV) OF RICE CULTIVATION

<table>
<thead>
<tr>
<th>Cultivation</th>
<th>Factor</th>
<th>Proportionate Change in Output Elasticity</th>
<th>Nature of Technical Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYV</td>
<td>Human labour</td>
<td>0.0144</td>
<td>Human Labour using</td>
</tr>
<tr>
<td></td>
<td>Bullock Labour</td>
<td>-0.0096</td>
<td>Fertilizer saving</td>
</tr>
<tr>
<td></td>
<td>Fertilizer</td>
<td>-0.0136</td>
<td>Pesticides saving</td>
</tr>
<tr>
<td></td>
<td>Pesticides</td>
<td>0.0086</td>
<td>Bullock Pair using</td>
</tr>
<tr>
<td></td>
<td>Land</td>
<td>0.0244</td>
<td>Land Using</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
<td>-0.0233</td>
<td>Capital Saving</td>
</tr>
</tbody>
</table>

Source: Sample Survey

Table-2 reveals that HYV of rice cultivation is biased in favor of human labour, pesticides and land and it against for bullock labour, fertilizer and capital. This shows the need for intensive use of human labour, pesticides and land rather than fertilizer and other variable inputs in the HYV of rice cultivation. Thus, the cultivation of HYV of rice leads to a considerable using a labour in the study area. The HYV of rice cultivation reduces the problem of unemployment in the agricultural sector, particularly in the study area.

TABLE-3: YIELD CONSTRAINTS OF LARGE FARMERS PRODUCING HIGH YIELDING VARIETY (HYV) OF RICE

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Constraints</th>
<th>Mean Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Severity of disease and pest attacks</td>
<td>61.24</td>
<td>I</td>
</tr>
<tr>
<td>2.</td>
<td>Water shortage</td>
<td>52.63</td>
<td>II</td>
</tr>
<tr>
<td>3.</td>
<td>Inadequate credit facilities</td>
<td>43.44</td>
<td>III</td>
</tr>
<tr>
<td>4.</td>
<td>Non-availability of input (Seeds)</td>
<td>41.15</td>
<td>IV</td>
</tr>
<tr>
<td>5.</td>
<td>Weeds</td>
<td>36.24</td>
<td>V</td>
</tr>
<tr>
<td>6.</td>
<td>Traditional methods</td>
<td>31.49</td>
<td>VI</td>
</tr>
</tbody>
</table>
It is found from Table-3 that the severity of diseases and pest attacks was ranked first followed by water shortage. Inadequate credit facilities were ranked third and non-availability of inputs (seeds) ranked fourth. Weeds and traditional methods were ranked fifth and sixth.

**TABLE-4: YIELD CONSTRAINTS OF SMALL FARMERS PRODUCING TRADITIONAL VARIETY (TV) OF RICE**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Constraints</th>
<th>Mean Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Inadequate credit facilities</td>
<td>58.15</td>
<td>I</td>
</tr>
<tr>
<td>2.</td>
<td>Water shortage</td>
<td>45.99</td>
<td>II</td>
</tr>
<tr>
<td>3.</td>
<td>Non-availability of inputs (Seeds)</td>
<td>35.64</td>
<td>III</td>
</tr>
<tr>
<td>4.</td>
<td>Severity of disease and pest attacks</td>
<td>31.49</td>
<td>IV</td>
</tr>
<tr>
<td>5.</td>
<td>Traditional methods</td>
<td>30.19</td>
<td>V</td>
</tr>
<tr>
<td>6.</td>
<td>Weeds</td>
<td>26.62</td>
<td>VI</td>
</tr>
</tbody>
</table>

It is inferred from table 4 that the inadequate credit facilities were ranked first followed by water shortage. Non-availability of input (seeds) was ranked third and severity of diseases and pest attacks ranked fourth. Traditional methods and weeds were ranked fifth and sixth.

**PRESENT SITUATION OF TAMILNADU AGRICULTURE**

Agriculture provides direct livelihood to 59 per cent of the labour force in India. 35 per cent of India’s population below the poverty line lives in rural areas, and is directly or indirectly dependent on agriculture. Agriculture contributes more than 22 per cent of GDP (2007 estimates), although the share has progressively come down from 57 per cent in 1950-51. In developed countries like the UK and USA, the share of agriculture in GDP is only around two per cent. It accounts for about 10 per cent of total value of India’s commodity exports. Bulk of agricultural exports consists of 13 key commodities including tea, coffee, tobacco, cashew, spices, raw cotton and sugar. Almost 30 per cent of tea produced in the country and 50 per cent of coffee and jute are exported. In addition to this, credit must be given for export of manufactured goods using agricultural raw materials, which accounts for another 15 per cent of India’s exports. Indian agriculture has been able to improve the per capita net availability of foodgrains to 451 grams (2007) from 395 grams in 1950’s. The gross irrigated area increased from less than one million hectares per annum before green revolution (mid 60s) to about 2.5 million hectares per annum during the 1970’s. Total gross irrigated area is now 80 million hectares. Total food grains (cereals and pulses) production increased from 48.1 million tonnes in 1950-51 to 230.67 million tonnes in 2008. While overall growth in food grains production has been impressive assisted by the technological breakthrough, one disturbing aspect is the year-to-year fluctuation in cereals output which affects the employment and income of the poor who depend solely on on-farm activities.

**Conclusion**

Thus, it is concluded from the analysis that small farmers are economically more efficient than large farmers irrespective of varieties of Agriculture production. This indicated that apart from efficient allocation of inputs, direct supervision and farm management are crucial determinants of economic efficiency. Government should encourage the farmers to start co-operative societies in the study area in order to develop a direct link between the wholesalers/retailers, processors and exporters to cut down the marketing cost incurred for lengthy channel. Such measures shall certainly pave the way for the farmer’s greater success.

**Ethical Clearance:** Completed

**Source of Funding:** Self

**Conflict of Interest :** Nil

**References**

4. Francis Cherunilam, Business Environment – Text


Prevalence of Musculoskeletal Disorders and Visual Problems among Software Engineers and its Association with Work Related Variables

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Department of Community Medicine, JSS Medical College, Mysuru

Abstract

Background: WHO refers musculoskeletal disorder as “work-related conditions” because they can be caused by work exposures as well as non-work factors. They form the second greatest cause of disability, as measured by years lived with disability (YLDs) worldwide and across most regions of the world. With the increase in the computer usage in every field, with the IT boom and with the vision of digitalized India; studies on health among computer users is the need of the hour. Objectives: 1. To estimate the prevalence of Work related Musculoskeletal Disorder and Computer Vision Syndrome. 2. To assess the association of work related exposure variables with Work related Musculoskeletal Disorder and Computer Vision Syndrome. Methodology: A Cross-sectional study conducted among IT professionals with minimum of 6 months of work experience and minimum 4 hours of working on computers daily were included in the study. Standardized Nordic Questionnaire was used to collect information on musculoskeletal symptoms, visual symptoms and work related variables. Results: 89% of the study participants had work related musculoskeletal disorders. Majority had trouble in lower-back followed by neck, wrist and shoulder. Significant statistical association was found between work related exposure variables: age, sex, number of breaks taken during working hours and years of experience with WMSD. The prevalence of Computer vision syndrome is seen to be 86.5%. Majority of them had redness of eyes followed by headache, watering of eyes and burning/itching sensation in the eyes. Association of sex, exercise, and breaks taken during working hours had significant statistical association with CVS. Conclusion: In the present study, more than three fourth were found to have WMSD and CVS. Proper ergonomics at work place and periodic health checkups of employees by physician and ophthalmologist will reduce WMSD and CVS.

Keywords: Work related musculoskeletal disorders, Computer vision syndrome, IT professionals, India.

Introduction

Musculoskeletal conditions include joint diseases such as osteoarthritis and rheumatoid arthritis; back and neck pain; osteoporosis and fragility fractures; soft tissue rheumatism; injuries due to sports and in the workplace; and trauma commonly related to road traffic accidents. They cause pain, physical disability and loss of personal and economic independence1. Work related Musculoskeletal Disorder (WMSD) being an extremely common condition is the disorder of the muscles, skeleton and related tissues which have been empirically shown or are suspected to have been caused by a workplace activity (particularly a repetitive activity)2. World Health Organization refers to them as “work-related conditions” because they can be caused by work exposures as well as non-work factors. They form the second greatest cause of disability, as measured by years lived with disability (YLDs) worldwide and across most regions of the world1. With the increase in the computer usage in every field, with the IT boom...
and with the vision of digitalized India; studies related to musculoskeletal disorders is the need of the hour. Another health issue common among software engineers is Computer Vision Syndrome (CVS). It is also referred to as Digital Eye Strain, described by a group of eye and vision-related problems that result from prolonged computer, tablet, e-reader and cell phone use. Though various studies conducted in India show the prevalence of Musculoskeletal disorder between 54% - 76.5% (4-10) and CVS ranging from 33.7% - 83.5% (8-13), there are limited studies available on the association of work related variables with WMSD and CVS. Hence this study is planned with the intention to contribute in this direction.

**Objectives**

- To estimate the prevalence of Work related Musculoskeletal Disorder and Computer Vision Syndrome
- To assess the association of work related exposure variables with Work related Musculoskeletal Disorder and Computer Vision Syndrome

**Methodology**

It was a Cross-sectional study conducted among the IT professionals working in the Software Companies of Mysuru and Bengaluru city. The study duration was 2 months. Professionals with minimum of 6 months of work experience and minimum 4 hours of working on computers daily are included in the study. Those with previous history of traumatic injuries associated with falls, trips or accidents, congenital musculoskeletal problems, pre-existing neuromuscular conditions and medical history of ankylosing spondylitis, peripheral neuropathy, rheumatoid arthritis or any other condition affecting the bone or muscles and those with visual problems diagnosed prior to joining for work were excluded from the study. Using the formula $4pq/l^2$, with the prevalence of 76.5% from the previous study and allowable error of 10% sample size was estimated to be 72. With a non-response rate of 10%, the sample size obtained was 80 which were rounded to 100. Hence questionnaire was mailed to 100 to collect the data. Line listing of Software companies in Mysuru city and Bengaluru city. The mail id’s of the employees were collected. Pre structured and pre tested Questionnaire was mailed to employees and data was collected. Standardized Nordic Questionnaire was used to collect information on musculoskeletal symptoms, visual symptoms and work related variables.

**Statistical Analysis:**

Data obtained was entered into SPSS V.22 and analyzed using the same. Analysis was done by using descriptive statistics viz proportions, mean etc. and inferential statistics like chi-square analysis was used to know the association of work related exposure variables with musculoskeletal disorder and visual problems. Results are presented in appropriate tables and figures as required.

**Ethical Considerations:**

Voluntariness and Confidentiality is the guiding principles of the study. Informed consent was obtained from every study participant. Ethical clearance was obtained from the Ethics Committee.

**Results**

Among the 100 study participants 12 did not respond and hence data from 82 employees were included for data analysis. Among the study participants, the mean age was 29±6 yrs. 69.5% were under 30 years of age and majority (61%) were males. 67% had less than 5 years of experience, 39% exercised regularly and majority (51%) took break less than 3 times/day during working hours, followed by 30.5% who did not take break.89% of the study participants had work related musculoskeletal disorders. Majority had trouble in lower-back(56.1%) followed by neck(46.3%), wrist(41.5%) and shoulder(37.8%). 86.5% of the study participants had computer vision syndrome. Majority of the study participants had redness of eyes (57.3%) followed by headache (54.9%), watering of eyes (54.9%) and burning/itching sensation in the eyes(50%).

There was significant statistical association seen between age (affecting more above 30 years), sex (affecting more number of males), breaks taken (affecting those who did not take breaks/ took < 3 breaks) and job experience( affecting those with >5 yrs) with Work related musculoskeletal symptoms (Table 1).
Table 1: Table showing relation between the Work related exposure variables and Musculoskeletal disorders

<table>
<thead>
<tr>
<th>Variables</th>
<th>WMSD</th>
<th>p-value</th>
<th>Variables</th>
<th>WMSD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤30yrs</td>
<td>18(31.6%)</td>
<td>39(68.4%)</td>
<td>&lt;0.001*</td>
<td>yes</td>
<td>10(17.9%)</td>
</tr>
<tr>
<td>&gt;31yrs</td>
<td>20(80%)</td>
<td>5(20%)</td>
<td></td>
<td>no</td>
<td>13(50%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤30yrs</td>
<td>15(26.3%)</td>
<td>42(73.7%)</td>
<td>0.001</td>
<td>yes</td>
<td>3(5.4%)</td>
</tr>
<tr>
<td>&gt;31yrs</td>
<td>16(64%)</td>
<td>9(36%)</td>
<td></td>
<td>no</td>
<td>8(30.8%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>10(31.3%)</td>
<td>22(68.8%)</td>
<td>0.028</td>
<td>≤5yrs</td>
<td>14(25.5%)</td>
</tr>
<tr>
<td>Male</td>
<td>28(56.0%)</td>
<td>22(44.0%)</td>
<td></td>
<td>&gt;6yrs</td>
<td>17(63%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>7(21.9%)</td>
<td>25(78.1%)</td>
<td>0.017</td>
<td>not taken</td>
<td>10(40%)</td>
</tr>
<tr>
<td>Male</td>
<td>24(48%)</td>
<td>26(52%)</td>
<td></td>
<td>≤3 times</td>
<td>9(17.6%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1(3.1%)</td>
<td>31(96.9%)</td>
<td>0.001*</td>
<td>not taken</td>
<td>13(52%)</td>
</tr>
<tr>
<td>Male</td>
<td>17(34%)</td>
<td>33(66%)</td>
<td></td>
<td>≤3 times</td>
<td>10(19.6%)</td>
</tr>
<tr>
<td>Breaks taken</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9(16.1%)</td>
<td>47(83.9%)</td>
<td>0.025</td>
<td>&gt;4 times</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>10(38.5%)</td>
<td>16(61.5%)</td>
<td>No of breaks</td>
<td>Upper back</td>
<td></td>
</tr>
<tr>
<td>Breaks taken</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19(33.9%)</td>
<td>37(66.1%)</td>
<td>0.042</td>
<td>≤3 times</td>
<td>3(5.9%)</td>
</tr>
<tr>
<td>No</td>
<td>15(57.7%)</td>
<td>11(42.3%)</td>
<td></td>
<td>&gt;4 times</td>
<td>0</td>
</tr>
</tbody>
</table>

*Fisher Exact test

There was significant statistical association seen between sex (affecting more males), exercise (affecting those who did not exercise regularly) and breaks (affecting more of those who did not take break and took < 3 breaks) with visual symptoms (Table 2).
Table 2: Table showing relation between the Work related exposure variables and Visual symptoms

<table>
<thead>
<tr>
<th>Variables</th>
<th>Visual symptoms</th>
<th>p-value*</th>
<th>Variables</th>
<th>Visual symptoms</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
<td>No</td>
<td></td>
<td>yes</td>
<td>No</td>
</tr>
<tr>
<td>Sex female</td>
<td>12(37.5%)</td>
<td>20(62.5%)</td>
<td></td>
<td>19(76%)</td>
<td>6(24%)</td>
</tr>
<tr>
<td>Sex male</td>
<td>35(70%)</td>
<td>15(30%)</td>
<td></td>
<td>≤3 times</td>
<td>24(47.1%)</td>
</tr>
<tr>
<td>Exercise</td>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>23(46%)</td>
<td>27(54%)</td>
<td></td>
<td>No of breaks</td>
<td>Watering of eyes</td>
</tr>
<tr>
<td>No</td>
<td>22(68.8%)</td>
<td>10(31.3%)</td>
<td></td>
<td>not taken</td>
<td>19(76%)</td>
</tr>
<tr>
<td>Breaks taken</td>
<td>Watering of eyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26(46.4%)</td>
<td>30(53.6%)</td>
<td></td>
<td>≤3 times</td>
<td>22(43.1%)</td>
</tr>
<tr>
<td>No</td>
<td>20(76.9%)</td>
<td>6(23.1%)</td>
<td></td>
<td>&gt;4 times</td>
<td>0</td>
</tr>
<tr>
<td>Breaks taken</td>
<td>Pain in eyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22(39.3%)</td>
<td>34(60.7%)</td>
<td></td>
<td>≤3 times</td>
<td>20(39.2%)</td>
</tr>
<tr>
<td>No</td>
<td>20(76.9%)</td>
<td>6(23.1%)</td>
<td></td>
<td>&gt;4 times</td>
<td>1(16.7%)</td>
</tr>
<tr>
<td>Breaks taken</td>
<td>Irritation in the eyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21(37.5%)</td>
<td>35(62.5%)</td>
<td></td>
<td>not taken</td>
<td>17(68%)</td>
</tr>
<tr>
<td>No</td>
<td>17(65.4%)</td>
<td>9(34.6%)</td>
<td></td>
<td>≤3 times</td>
<td>21(41.2%)</td>
</tr>
<tr>
<td>Breaks taken</td>
<td>Blurring/itching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21(37.5%)</td>
<td>35(62.5%)</td>
<td></td>
<td>&gt;4 times</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>20(76.9%)</td>
<td>6(23.1%)</td>
<td></td>
<td>not taken</td>
<td>21(84%)</td>
</tr>
<tr>
<td>Breaks taken</td>
<td>Redness of eyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25(44.6%)</td>
<td>31(55.4%)</td>
<td></td>
<td>≤3 times</td>
<td>25(49%)</td>
</tr>
<tr>
<td>No</td>
<td>22(84.6%)</td>
<td>4(15.4%)</td>
<td></td>
<td>&gt;4 times</td>
<td>1(16.7%)</td>
</tr>
<tr>
<td>Breaks taken</td>
<td>Blurring of vision</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13(23.2%)</td>
<td>43(76.8%)</td>
<td></td>
<td>≤3 times</td>
<td>14(27.5%)</td>
</tr>
<tr>
<td>No</td>
<td>19(73.1%)</td>
<td>7(26.9%)</td>
<td></td>
<td>&gt;4 times</td>
<td>0</td>
</tr>
</tbody>
</table>

*Fisher exact test

Discussion

With respect to the prevalence of Work related musculoskeletal disorder in our study was 89%. Various studies have shown prevalence ranging from 20 to 93.3% [5]. Sharma et al study conducted at Delhi reported 77.5%, Talwar R et al study reported 76.5%, Giri et al reported 73.3%, Saleem M et al study and Prasad et al conducted at Nagpur reported 69% and 67% respectively and Shbair & Abdulla conducted at Jordan reported a very high prevalence of 93.3%. This contrast result was noted as they included professionals from varied job like computer programmers, secretaries, engineers and computer lab supervisors. WMSD affecting lower-back (56.1%) was found in majority of the employees followed by neck(46.3%), wrist(41.5%)
shoulder (37.8%) and knees (13.4%). Similar results was noted in Swetha NB et al study\(^\text{11}\) where in lower-back was affected in back and neck was 55% and 46.6% respectively. Similar order of occurrence i.e lower back (40.4 %), followed by the upper back (39.5 %), neck (38.6 %), hand/wrist (36.8%) and shoulder (15.2 %) and least in knees (2.2%) was noted by Moom R et al study\(^\text{4}\). Sillapaa J et al study\(^\text{12}\) showed a that WMSD affected neck (63%) in majority of the study participants. Significant statistical association was found between the work related exposure variables with WMSD with respect to age, sex, number of breaks taken during working hours and years of experience. Regarding the association the present study shows that as the age advances and work experience increases WMSD, which is in par with the findings of Moom R et al study\(^\text{4}\), Saleem et al study\(^\text{5}\) and Sharma et al study\(^\text{6}\). Sex is associated with WMSD affecting Men more compared to women. This may be due to the reason that women are regularly involved in household chores which might contribute to routine stretching of muscles in them. Taking no/less breaks during working hours was statistically associated with WMSD. This finding is in par with Shwetha NB et al study\(^\text{11}\).

The **prevalence of Computer vision syndrome** is seen to be 86.5%. Similar observation was seen in the Venkatesh et al study\(^\text{13}\) (83.5%) and Logaraj M et al study\(^\text{15}\) (80.3%). Swetha NB et al\(^\text{11}\), Sharma AK et al\(^\text{6}\) and Talwar R\(^\text{7}\) et al also reported a prevalence of 78.33% 76% and 76% respectively. Study done by Chendilnathan C et al\(^\text{16}\) reported prevalence of CVS as 97.4%. This may be due to the reason that their inclusion criteria was to included professionals with less than 4 hours of working/day on computer. Common **visual problems** reported were redness of eyes (57.3%), headache (54.9%), watering of eyes (54.9%) and burning/itching sensation in the eyes (50%). Similar findings were also seen in Shanta kumari N et al study\(^\text{13}\): headache (53.3%) and burning sensation (54.8%), Chendilnathan C et al\(^\text{16}\) study : headache (56%) and Talwar R et al\(^\text{7}\) study: redness of eyes(40.7%), headache (29.2%), and burning/itching (29.8%). Our results contrasted with the findings of Swetha NB et al\(^\text{11}\) where redness of eyes was 9% and common symptoms noted were watering(39%) and pain in the eyes(39%). Association of sex, exercise, and breaks taken during working hours had significant statistical association with CVS, which was in par with Lograj M et al study\(^\text{15}\).

While the **Strength** of our study would be that we have tried to associate the work related exposure variables with Work related Musculoskeletal disorders and Visual symptoms apart from identifying their prevalence. There are very few studies focusing on such objective. The **Limitation** of our study would be a small sample size and inclusion of only software engineers as study participants because of which comparison of the findings was not possible.

**Conclusion**

In the present study, more than three fourth were found to have WMSD and CVS. Proper ergonomics at work place and periodic health checkups of employees by physician and ophthalmologist will reduce WMSD and CVS.

Our **Recommendations** would be to adopt proper ergonomics at work place, creating enabling environment for frequent mini breaks which wouldn’t affect the work productivity, organizing physical activity sessions or workshops at workplace and periodic health checkups of employees by physician and ophthalmologist.

**Declarations:**

**Funding:** Self

**Conflict of Interest:** Nil

**References**


5. Saleem M, Priya S, Govindarajan R, Balaji E, Diwahar Anguraj J, Shylendra Babu PG,


Prevalence and Predictors of Musculoskeletal Disorders in Desk Job Workers

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Abstract

Objective: The aim of the study was to find out the prevalence and predictors of musculoskeletal problems in desk job workers.

Background of the Study: Musculoskeletal disorders were commonly reported by office workers worldwide. At the same time the duration of computer work in a modern occupational setting has increased dramatically. On work process, most of the desk job workers have pain in their neck, back region and even abnormal posture may also occur sometimes. The risk of developing musculoskeletal disorders was higher among workers who have a high work strain and muscle tension. Awareness and knowledge of the relationship between computer usage and musculoskeletal disorders are essential to prevent before it could progressed.

Methodology: This is a observational study of survey method includes a total of 100 subjects who are selected between the age group of 30 to 40 years among the desk job workers based on inclusion and exclusion criteria. Data regarding the musculoskeletal problem were collected using the Orebro Musculoskeletal Pain questionnaire, Patient Health questionnaire (PHQ) and Cornell Musculoskeletal disorder questionnaire.

Result: On comparing the prevalence of musculoskeletal problems among desk job workers, the collected data shows that the prevalence of neck pain with 47 % and shoulder pain with 28% is more than the other sites like lower back, upper back, elbow, knee, leg and ankle.

Conclusion: This study concluded that desk job workers are more prone to neck pain than comparing to pain at any other sites.

Keywords: Orebro musculoskeletal pain questionnaire, PHQ and Cornell musculoskeletal pain questionnaire and Desk job workers.

Introduction

Musculoskeletal disorders (MSDs) are injuries or pain in the human musculoskeletal system, including the joints, ligaments, muscles, nerves, tendons, and structures that support limbs, neck and back1. MSDs can arise because of improper physical factors with ergonomic, psychological, social, and occupational factors. MSDs are an increasing healthcare issue globally, it is the second leading cause of disability7. Musculoskeletal disorders are the most prevalent disorders among computer operators in general populations3,4. For people who spend a great deal of time with computer, work related neck pain is a common problem encountered every day. The musculoskeletal pain can be attributed to numerous risk factors, including prolonged static posture, repetitive
movement, poor posture, genetic predisposition, mental stress, age and physical condition\(^3\). Both men and women are prone to neck pain but it is most common in women (53.7\%) than in men (32.7\%) \(^3\).

Neck pain is the most common chronic pain problems with a reported prevalence of 22\% to 30\%\(^6,7\). The cervical region is an important structure that supports the weight of the head and provides more mobility to cervical spine on the contrary to the stability. Because of this the muscles around the cervical region is most commonly stressed and leads to neck pain. It usually involves muscle spasm, strain and tightness of the neck muscles. The presence of problems in the muscle and bones causes limitation of joint range\(^8\).

Globally, the overall prevalence of neck pain in general population ranges between 0.4\% and 86.8\%. The incidence of neck pain was estimated to be in the range between 10.4\% and 21.3\% with a higher incidence noted in office and computer workers\(^9\). India has 18.7\% population who suffer from neck pain and it affects 45\% of today workers\(^10\).

LBP is a very common health problem worldwide. Most cases of lower back pain can be linked to a general cause such as muscle strain, injury, or overuse. In industrial workers, it affects approximately 60\% \(^11\). The Low Back Pain is the major work related musculoskeletal disorder among the IT Professionals \(^12\).

Shoulder is also a common health problem worldwide and it is a major cause of disability. Shoulder pain affects about 16\% to 21\% in the general populations\(^13\).

Consequently this study was done on samples using computer to a large extent which is focused on risk factors for the development of muscular skeletal symptoms. Based on the duration of computer usage, repetitive movement, static and non-neutral wrist, arm neck work posture, lack of variations and psycho socio factors, the development of musculoskeletal disorder varies\(^14\).

Due to the long lever arm of the upper limb, the shoulder joint can be exposed to high forces. The tendons around the joint (rotator cuff) have a poor blood supply and are therefore more prone to degenerate with age than the tendons in other locations. Injuries and tendon inflammation can be common cause of MSDs in this area.\(^15\)

Orebro musculoskeletal pain screening questionnaire (OMPSQ) was developed by Linton and Halden. OMPSQ can be used to identify patients with spinal pain. This questionnaire can be considered as a validated tool for identifying patients with chronic neck pain \(^7\). The Patient Health Questionnaire (PHQ) is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders. PHQ-9 scores of 5, 10, 15, and 20 represented mild, moderate, moderately severe, and severe depression, respectively. The PHQ-9 was highly valid and reliable tools to screen depression \(^16\). Cornell Musculoskeletal Discomfort Questionnaires (CMDQ) has been developed by Dr. Alan Hedge. CMDQ is a well-designed data collection tool. The CMDQ was highly valid and reliable \(^17\).

**Materials & Method**

This is an observational study conducted at corporate sector & took nearly 2 month (Jan 2018-Mar 2018) to complete the study. Once the study gets approved from IRB REF NO: IV C- 034/ PHYSIO/ IRB/2017-2018, 100 samples were selected from 140 volunteers based on inclusion criteria of both males and females, Age group between 30 to 40, Minimum 8 hours of office workers and excluded Cervical disc degenerative disease, Herniated disc, cervical spine fracture, Meningitis, Tuberculosis of spine.

The subjects were fully explained about the study, the questionnaire to be filled and benefits of participating in the study. Initially demographic variables of the samples collected & were asked to fill the consent form in acceptance for study participation duly signed by samples & therapist ensuring confidentiality. Questionnaires were given to the subjects that include Orebro musculoskeletal pain questionnaire, Patient Health questionnaire (PHQ) and Cornell musculoskeletal disorder questionnaire.

**Data Analysis**

The collected data were tabulated and analysed using descriptive Statistics and Regression Analysis. All the parameters were assessed using statistical package for social science (SPSS) version 24. Descriptive Statistics was adopted to find the Mean Standard deviation, Minimum and Maximum Range. Multiple Logistic Regression analysis was done to find the factors associated with Orebro musculoskeletal pain score, Cornell musculoskeletal disorder questionnaire &
TABLE - 1: DEMOGRAPHIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>48%</td>
</tr>
<tr>
<td>Female</td>
<td>52%</td>
</tr>
<tr>
<td>Age</td>
<td>26.23 ± 4.72</td>
</tr>
<tr>
<td>Height</td>
<td>158.28 ± 8.01</td>
</tr>
<tr>
<td>Weight</td>
<td>63.22 ± 10.74</td>
</tr>
<tr>
<td>Body Mass Index(BMI)</td>
<td>24.28 ± 3.18</td>
</tr>
<tr>
<td>Work Hours</td>
<td>9.22 ± .823</td>
</tr>
</tbody>
</table>

TABLE - 2: PREVALENCE RATE OF MUSCULOSKELETAL DISORDERS (MSD)

<table>
<thead>
<tr>
<th>SITE OF PAIN</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NECK</td>
<td>47%</td>
</tr>
<tr>
<td>SHOULDER</td>
<td>28%</td>
</tr>
<tr>
<td>LOWER BACK</td>
<td>10%</td>
</tr>
<tr>
<td>ELBOW</td>
<td>5%</td>
</tr>
<tr>
<td>KNEE</td>
<td>4%</td>
</tr>
<tr>
<td>LEG &amp; ANKLE</td>
<td>4%</td>
</tr>
<tr>
<td>UPPER BACK</td>
<td>2%</td>
</tr>
</tbody>
</table>

TABLE - 3: GROSS PERCENTAGE OF OREBRO MUSCULOSKELETAL PAIN QUESTIONNAIRE SCORE

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage(%) n = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>OREBRO MUSCULOSKELETAL PAIN QUESTIONNAIRE</td>
<td></td>
</tr>
<tr>
<td>&lt; 105 (Low Risk)</td>
<td>89%</td>
</tr>
<tr>
<td>105 - 130 (Moderate Risk)</td>
<td>11%</td>
</tr>
<tr>
<td>&gt;130(High Risk)</td>
<td>0%</td>
</tr>
</tbody>
</table>

TABLE - 4: GROSS PERCENTAGE OF PATIENT HEALTH QUESTIONNAIRE SCORE

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage(%) n = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATIENT HEALTH QUESTIONNAIRE</td>
<td></td>
</tr>
<tr>
<td>5-9 (Minimal Symptoms)</td>
<td>1%</td>
</tr>
<tr>
<td>10-14(Major Depression, Mild)</td>
<td>13%</td>
</tr>
<tr>
<td>15-19(Major Depression, Moderate)</td>
<td>71%</td>
</tr>
<tr>
<td>&gt;20(Major Depression, Severe)</td>
<td>15%</td>
</tr>
</tbody>
</table>

TABLE - 5: Regression Analysis of Significant Factors Predicting Musculoskeletal Pain Score

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>B</th>
<th>S.E</th>
<th>P VALUE</th>
<th>EXP(B)</th>
<th>95% CONFIDENCE INTERVAL OF EXP (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LOWER</td>
</tr>
<tr>
<td>AGE</td>
<td>1.889</td>
<td>5.89</td>
<td>0.497</td>
<td>6.68</td>
<td>6.331</td>
</tr>
<tr>
<td>BMI</td>
<td>6.10</td>
<td>6.89</td>
<td>0.376</td>
<td>5.34</td>
<td>1.13</td>
</tr>
<tr>
<td>WORK HOURS</td>
<td>0.551</td>
<td>.071</td>
<td>0.041*</td>
<td>1.76</td>
<td>1.37</td>
</tr>
</tbody>
</table>

The above table shows that there is a statistically significant association between Work Hours and Musculoskeletal Disorder (MSD) in Desk Job Workers. Work hours have been positively associated with higher Orebro musculoskeletal pain score and Patient Health Questionnaire.

Result

The prevalence of musculoskeletal disorders among the desk job workers based on the site is higher in neck region with 47% followed by shoulder, lower back, upper back, elbow, knee, leg & ankle with 28%, 10%, 2%, 5%, 4% and 4% respectively (table 2). Gross percentage for OMPQ was 89% with low risk and 11%
with moderate risk. The depression among desk job workers was severe with 15%, moderate with 71%, mild with 13% and minimal with 1%.

Regression Analysis of Significant Factors Predicting Musculoskeletal Pain Score among Desk Job Workers shows a significant association between work hours and musculoskeletal disorder. Work hours have been positively associated with higher OMPS and PHQ with the p value 0.041* which is 1.37 lower and 1.96 upper in 95% confidence interval.

The results shows that, there are some factors which predict musculoskeletal disorders like long hours of work & in general females are affected more than males.

Discussion

This is an Experimental study with 100 sample size who were desk job workers. The results showed higher prevalence of disorders in the neck & shoulder complaints in the study population compared to low back, leg, arm & upper back complaints. In this present study it was observed that age, sex, smoking/drinking habit job duration and posture also contribute to increase in MSD in desk job workers. It is recommended that proper work posture; healthy working conditions must be provided which can make the work easier and more relaxed. Furthermore musculoskeletal complaints of neck & shoulder in particular, were more common among women than men, even though women & men are working for same time. Another study confirmed our finding, showing the prevalence of symptoms in the neck & upper extremities per year was found to be 51% among men &72% among women.

The prevalence of pain was high for all musculoskeletal locations, overall more than 80% of responding Danish fisherman reported low back pain with more than 80%of Danish fisherman reporting only Low back pain during past year.

Another study assessed the prevalence of MSDS among rubber tapper on two larger plantations in Srilanka, work environment behavioural psychosocial factor of interest. The prevalence of MSDS in last 12month was high where 66% of tappers suffered from at least one MSD. The most common body region involved was the back 43%, shoulder 23% & neck 19.3%. Musculoskeletal problem amongst profession truck drivers has often been associated with high prevalence of low back pain.

The factor that contribute to cause the pain are drivers and might include prolonged sitting, exposure of whole body vibration and other non-driving factor such as heavy lifting, poor dieting & other psychological factor. 81% of them reported some musculoskeletal pain during the previous 12 month & 60% reported low back pain. In the prevalence of musculoskeletal among the tailor was reported to be 65.4%most common site being neck followed by low back pain, upper back & shoulder.

Tailoring involves monotonous, highly repetitive tasks like cutting, pressing and finishing performed in a sitting working posture with upper back curved and head bent over the sewing machine.so far working in this awkward posture for a long duration increased the chance of developing musculoskeletal disorders.

A systematic review of literature had shown musculoskeletal disorders in workers was associated with age, previous neck pain, high quantitative job demands, low physical capacity, work posture, repetitive work. In additions gender, occupation, headache, emotional problem, smoking may be associated by musculoskeletal disorders. Such as working hours on the computer, prolonged sitting & forward flexion posture during working which were most common factors which had enhanced the risk of developing musculoskeletal disorder of among office employees.

Conclusion

This study concludes that there is prevalence of musculoskeletal disorders among office employees. People using computer for more than 8 hours, Age, gender, length of employment, health status and job satisfaction were known as risk factor for developing musculoskeletal disorders. This study was done to create awareness among the desk job workers about the long working hours & habitual poor posture which leads to musculoskeletal disorders. It is the responsibility of the corporate sector to design the working atmosphere ergonomically & comfortably to protect the health of their employees.

Limitation of the Study

Small sample size, Exercise intervention were not included for MSD, Limited age group, Limited to desk job workers only (tailors, textiles, weavers)

Authors Contribution: All authors have contributed equally.
Conflict of Interest: ‘Conflicts of interest: none’

Ethical Considerations: The manuscript is approved by the Institutional Review board of faculty of physiotherapy. All the procedures were performed in accordance with the ethical standards of the responsible ethics committee both (Institutional and national) on human experimentation and the Helsinki Declaration of 1964 (as revised in 2008).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed

Funding: Nil, This is a self-funded study

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Prevalence of Myths and Misconceptions about Dental Extractions among Outpatients of a Private Dental College Hospital

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Abstract

Background: Myths related to oral ailments and dental health care practices are very common in Indian society and it is strenuous to break this chain as these myths are deep rooted in the society. This study assesses the prevalence of myths and misconceptions about dental extraction among the outpatients of a private dental college hospital, the analysis of which provides an indirect measure of the knowledge, attitude and health seeking behavior of the community.

Materials and Method: A cross-sectional study was conducted by the out-patients attending dental institute, in Chennai city. A total of 200 individuals were included, data were collected using a pretested and validated two-part questionnaire including demographic data, questions regarding dental myth. Data obtained were statistically analyzed using descriptive statistics, chi square test.

Result: Based on gender among the participants of the survey, females were more believers of the myth and misconceptions (P < 0.05). Based on socioeconomic status, prevalence of the myths and misconceptions about dental extractions were high among lower class category (P < 0.05).

Conclusion: Almost all the participants believed in one or more myth pertaining to dental extractions.

Keywords: myths, dental, tooth extraction, misconception, oral health, gender, socio economic status.

Introduction

Oral health prevails to be an entity of negligence despite of constant and continuous efforts for health promotion, worldwide. The standard of oral health of a population greatly depends on elements such as diet, socioeconomic status, educational qualification and oral hygiene practices¹. Indian population is comprised of people from various different cultural backgrounds and there is a significant influence of the myths on the health seeking behavior of these people ². Scientifically myths are regarded as extensive and unquestioned false perspective that emerges from false traditional beliefs and non-scientific knowledge. These myths eventually get deep rooted in the minds of the future generations over a period of time and lead them towards a wrong protocol making it difficult for the dentist to provide satisfying treatment ³, ⁴. This kind of myths and misconceptions are also prevalent due to falsely exaggerated and manipulated information publicized by those who personally had a previous negative dental experience ⁵. Myths related to oral ailments and dental health care practices are very common in Indian society and it is strenuous to break this chain as these myths are deep rooted in the society. Understanding the prevalence of such myths and misconceptions becomes essential even to a health care provider to direct the society towards
proper heath care. One has to take some efforts to make oneself aware and understand the principle behind each myth regarding health because blindly believing or following it might lead to uneventful consequences. Thus public health awareness regarding these myths and misconceptions about dental health is required at the individual as well as community level. As the society becomes more complex, people’s expectations of health care is rising dramatically, understanding the myths and misconceptions about oral diseases is important in providing excellent care and health education to both patients and healthy individuals. The high prevalence of these myths will prevent such population from attaining proper dental care even if it could be made available to them. The purpose of this study is to assess the prevalence of myths and misconceptions about dental extraction among the population, the analysis of which provides an indirect measure of the knowledge, attitude and health seeking behavior of the community.

Materials and Method

Study Population:

A questionnaire descriptive “cross sectional study” was conducted among the outpatients in the age of 20-80 years attending the OPD of department of oral and maxillofacial surgery in Saveetha dental college and hospital; Chennai. The study involved 200 patients as participants. The identity of the patient who participated was maintained confidentially.

Inclusion Criteria:

Patients visiting the dental OPD who voluntarily agreed to participate

Exclusion Criteria:

People who refuse to participate in the study and people who could not comprehend the questions of the study despite the assistance.

Collection of Data

A questionnaire was developed to assess the prevalence of dental myth and misconceptions among the outpatients of department of oral surgery. The questionnaire was developed in English language. All the questions were given alternative options to facilitate the participants to make quick choices, and participants were asked to tick the most appropriate answer. Before finalizing the questionnaire, the questions were pretested in a pilot study on 15 patients, to assess their ability to interpret it. The questionnaire appeared to be easily understood and was finalized with no modification.

Permission was obtained from the institution authorities to administer the questionnaire to the patients. The objective of the study was explained to all the patients who participated in the study and also verbal consent was obtained from all of them. The completed questionnaire was collected back in 10-15 min by the investigator and checked for completeness. Any incomplete forms were asked to be completed. For the patients who did not understand the language a volunteer helped to translate all the questions with the choices of response and filled the form on behalf of the patient with the patient’s choice of responses.

The questionnaire was divided into two parts:

The first part of the questionnaire contained personal data of the patient such as name, age, gender, educational qualification, previous extraction history and B.G.Prasad’s scale was used to assess the socio-economic status. This scale divides the population into 5 categories based on their per capita income and the second part of the questionnaire contained 13 close ended questions about myths and misconceptions about dental extractions.

To statistically analyse the awareness among the study population, the responses to the questions were recorded as correct or wrong. Every correct answer was given a score of 1 and wrong answer was given a score of 0. Individuals receiving a total score of <7 was considered Low attitude and those with total score ≥ 7 was considered High attitude.

Result

Part 1: Demographic data: (Table 1)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequency (n (%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>20-35</td>
<td>115(57.50)</td>
</tr>
<tr>
<td>36-50</td>
<td>37(18.50)</td>
</tr>
<tr>
<td>51-65</td>
<td>41(20.50)</td>
</tr>
<tr>
<td>66-80</td>
<td>7(3.50)</td>
</tr>
</tbody>
</table>
Part 1: Demographic data: (Table 1)

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>97(48.50)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>103(51.50)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education qualification</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>27(13.50)</td>
</tr>
<tr>
<td>Below 10th Grade education</td>
<td>26(13)</td>
</tr>
<tr>
<td>10th grade education</td>
<td>22(11)</td>
</tr>
<tr>
<td>12th grade education</td>
<td>44(22)</td>
</tr>
</tbody>
</table>

| Graduate | 75(37.50) |
| Post Graduate | 4(2) |
| Diploma/Professional training | 2(1) |

<table>
<thead>
<tr>
<th>Socio-Economic Status</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>4(2)</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>26(13)</td>
</tr>
<tr>
<td>Middle class</td>
<td>72(36)</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>65(32.50)</td>
</tr>
<tr>
<td>Lower class</td>
<td>33(16.50)</td>
</tr>
</tbody>
</table>

Part 2: Responses for questions regarding myth and misconceptions about dental extractions (Table 2):

<table>
<thead>
<tr>
<th>Questions</th>
<th>Agree</th>
<th>No idea</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extracting front tooth of upper jaw causes nerve damage to eye/loss of eye sight</td>
<td>43</td>
<td>106</td>
<td>51</td>
</tr>
<tr>
<td>Extracting back tooth of upper jaw causes brain damage/severs nerves connected to brain</td>
<td>51</td>
<td>96</td>
<td>53</td>
</tr>
<tr>
<td>Extracting lower jaw teeth can result in damage to heart or can cause heart block</td>
<td>28</td>
<td>104</td>
<td>68</td>
</tr>
<tr>
<td>Suturing after tooth extraction is fearsome because it indicates complications in extraction</td>
<td>101</td>
<td>58</td>
<td>41</td>
</tr>
<tr>
<td>Suturing is more painful than extraction of teeth</td>
<td>103</td>
<td>56</td>
<td>41</td>
</tr>
<tr>
<td>Head bath should be avoided for a week after extraction of teeth</td>
<td>45</td>
<td>56</td>
<td>99</td>
</tr>
<tr>
<td>Extraction is better solution than restoration of a tooth</td>
<td>54</td>
<td>32</td>
<td>114</td>
</tr>
<tr>
<td>On Extraction of a permanent tooth new tooth will erupt</td>
<td>2</td>
<td>23</td>
<td>175</td>
</tr>
<tr>
<td>Malnourished and skinny patients will bleed more during extraction of teeth</td>
<td>41</td>
<td>77</td>
<td>82</td>
</tr>
<tr>
<td>Extraction during pregnancy will cause abortion of the fetus</td>
<td>39</td>
<td>87</td>
<td>74</td>
</tr>
<tr>
<td>Medicines can cure all the tooth problems completely</td>
<td>25</td>
<td>63</td>
<td>112</td>
</tr>
<tr>
<td>Tooth should not be extracted in rainy season/winter season</td>
<td>64</td>
<td>52</td>
<td>84</td>
</tr>
<tr>
<td>You are not supposed to take solid foods after tooth extraction for a week</td>
<td>84</td>
<td>46</td>
<td>70</td>
</tr>
</tbody>
</table>

About 43(21%) participants believed that extraction of upper front tooth affects vision, 51(25%) believed that extraction of upper back tooth affects nerves connected to brain, 28(14%) participants had a misconception that extraction of lower jaw teeth can affect heart. 101(50%) participants believed that extraction site suturing indicated some complication due to the extraction. 103 (51%) participants had a misconception that suturing is more painful than tooth extraction. 45(22%) participants believed in avoiding head bath for a week after tooth extraction is mandatory. 54(27%) participants thought that extraction was better than to save a tooth. 2 (1%) participants believed that there is chance of new tooth to erupt on extraction of a permanent tooth. 41(20%) participants believed that skinny and weak patients are prone to excessive bleeding during extraction. 39(19%) participants believe that extraction during pregnancy causes abortion. 25(12%) participants had a misconception that drugs cure tooth problems. 64(32%) participants believed that tooth extractions should be avoided during monsoon and winter. 84(42%) participants had a misconception that no solid food can
be consumed for a week after extraction.

Almost all the participants believed in one or more myth pertaining to dental extractions.

Based on the scores given to the correct and wrong answers of the participants to the questionnaire, the awareness of the participants was estimated.

**BASED ON GENDER:** (Graph 1): Among the participants of the survey 54.6% of males and 71.8% of females had a low attitude showing females have more belief in myths and misconceptions (P< 0.05).

**BASED ON SOCIOECONOMIC STATUS:** (Graph 2) Among the participants of the survey 100% of the upper class category, 80.7% of the upper middle class category, 50% of Middle class category, 18.4% of the Lower middle class and 3% of the Lower class category had a high attitude. This highlighted the prevalence of the myths and misconceptions about dental extractions in lower class category followed by lower middle class category of people (P< 0.05).

**Graph 1: Attitude of male and female on myth about dental extraction.**

**Graph 2: Association of dental myth scores with SES of the study population**

**Discussion**

Dental and oral diseases are the fourth most expensive diseases to treat. The total cost of traditional operative dental care would exceed the entire health care budget in many low income countries of the developing world. A remarkable influential factor is the awareness and educational level of population which reflects a country’s literacy rate. Education provides an individual the means of empowerment and freedom to promote creative thinking and imagination. This may also help in propelling an individual positively towards general as well as oral health. Myths can be prevalent in a population due to a variety of reasons like poor education, socioeconomic status, cultural beliefs and social misconceptions.

India being a developing country, is struggling to provide the necessary oral health to its population as majority of the Indian population resides in rural areas. India has a low budget to meet the oral health treatment needs, a high disease burden and a low literacy rate of its general population. All these act as predisposing factors that direct the general population to poor oral healthcare, false treatment need assumptions, and false beliefs.

Results of this study illustrate lack of knowledge and awareness about dental health on part of the general community. Prevalence of a large number of myths and misconceptions has adversely affected the community dental health. Literacy level of people and their socioeconomic status play a key role in the development of health sector of a country. In this study it was observed that the percentage of people who believed in myths was higher among the lower and lower middle class of socioeconomic category. The findings show that females believe more in myths and misconceptions than males.

Nearly 21% of the participants thought that extraction of the upper front tooth under local anesthesia may cause impairment of patient’s vision. The fact being that there is no relationship between vision and extraction of the upper front tooth. The results are similar to the studies done by Saravanan and Thirineervannan where 20% believed in the myth and Singh SV et al where 26% participants believed in the myth. While this figure is less compared to some other study reports which show nearly 35%-79% believe in this myth.

Nearly 27% of the participants thought that extraction of the teeth is a better option that to save it. This may be due to inadequate knowledge about treatment modalities like restoration and root canal treatments for saving a
tooth. This can also be due to the high cost and multiple visits needed for root canal treatment whereas extraction is a single visit procedure. This figure is less when compared to the previous studies done by Ripika Sharma et al. showing nearly 49% and Ain TS et al. showing 59% agreed to this fact.

The result of the current study shows that nearly half of the participants (50%) believed that suturing the extraction socket is an indication of some complication or mishap during the procedure and nearly 51% of the participants had a misconception that suturing will be more painful than extraction of the teeth. This was the most prevalent myth of the current study. The reason behind this might be due to the portrayal of suturing procedures in South Indian movies, indicating extensive trauma and injury. People are misled by this and assume that suturing itself is a serious surgical procedure indicating complications. A positive finding of this study was that most people were aware that tooth does not erupt after extraction of a permanent tooth.

**Limitation**

The results of this study cannot be applied to a larger population since this study was done in an urban setting. Furthermore, qualitative and quantitative research regarding the prevalence of myth and misconceptions about dental extraction on a larger sample and for a longer period of time in different regions and different population is necessary to validate the results of this study.

**Conclusion**

The study population has significant belief in one or more myth about dental extraction.

**Financial Support and Sponsorship:** Nil

**Conflicts of Interest:** None

**Ethical Clearance:** Obtained from the institutional ethical committee

**References**


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Effects of Musical Therapy and Physiotherapy in Pregnancy Induced Hypertension

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Abstract

Objective: To find out the effectiveness of musical therapy and physiotherapy in pregnancy induced hypertension.

Materials and Method: Ethical clearance was obtained from the Institutional Ethical Committee.40 women attending the antenatal therapy at physiotherapy outpatient department, Krishna Hospital, Karad, Maharashtra, India, were women with 3rd trimester of pregnancy with mild pregnancy induced hypertension participated in this study; 20 women in the GROUP A i.e. music group and 20 women in the GROUP B i.e. music and physiotherapy group by convenient sampling with random allocation of the subject.

Result: Inter group statistical analysis for systolic blood pressure revealed extremely significant in post intervention for group B (p<0.0001). Diastolic blood pressure was extremely significant for group B (P value<0.0001). Pulse rate was extremely significant for group B (p<0.0001). While Post intervention analysis showed extremely significant difference between Group A and Group B (p<0.0001).Group B treated with musical therapy and physiotherapy was extremely significant.

Conclusion: An integrated approach to combination of musical therapy and physiotherapy is safe and effective. It decreases the systolic blood pressure, diastolic blood pressure and pulse rate with less complication in delivery.

Keywords: Musical therapy, conventional physiotherapy, pregnancy induced hypertension.

Introduction

Severe stress or constant stress can negatively impact a pregnancy, leading to complications like poor health, preterm birth, low birth weight, sleep deprivation, and increased risk of behavioral and developmental problems in children1. Pregnancy is a condition in which women undergo distinct physiological changes and stress and is accompanied by unique physical and psychological demands. There is a need to manage the various physical, emotional, mental and pain states that arise throughout the stages of pregnancy and labour.

Hypertension is one of the common medical complications of pregnancy and contributes significantly to maternal and perinatal morbidity and mortality. Hypertension is a sign of an underlying pathology which may be pre-existing or appears for the first time during pregnancy. In the developing countries with inadequately cared pregnancy, this entity on many occasions remains undetected till major complications supervene.

Pre-eclampsia defined as pregnancy induced hypertension and proteinuria frequently combined with edema is asymptomatic in some women but induce severe symptoms in others. Hypertensive disorders during pregnancy are one of the leading causes of maternal death and are important causes of neonatal morbidity and mortality. The cause of this disease is however still unknown. Pre-eclampsia is a multisystem disorder of unknown etiology characterized by development of hypertension to the extent of 140/90mmHg or more with proteinuria after the 20th week in a previously normotensive and nonproteinuric woman. Edema is common in normal pregnancy. Edema has been excluded
from the diagnostic criteria unless it is pathological.

Music is noninvasive, culturally acceptable intervention with multiple direct and indirect beneficial effects on mother and foetus through the pregnancy and perinatal period. Music has been shown to beneficially affect stress response, besides direct influence on emotions and behavioral effects on cognitive performance can also occur. Music has a long history of healing physical and mental illness. Many clinical findings indicate that music reduces blood pressure in various patients and attenuates symptoms in various types of diseases.¹

To cope up with psychological and emotional changes physiotherapy will integrate body, mind and spirit. It will reduce the severity of anxiety, improves their breathing capacity to have a natural, pleasurable feeling throughout all three trimesters. They bring harmony; develop a restful and positive attitude towards life. Create positive mental and physical development of the fetus, inside the womb of the mother, which ensures the baby’s healthy growth in the womb.⁵

Yoga typically combines stretching exercises and different poses with deep breathing and meditation, yoga is designed to stretch and tone the muscles and to keep the spine and joints flexible. Some suggest that bending, twisting and stretching movements also massage the internal organs and glands. Yoga poses are generally done with deep, diaphragmatic breathing that is thought to increase oxygen flow to the brain. A series of poses that are called Asanas in Sanskrit are performed slowly and sequentially, concentrating each movement on the deep abdominal breathing that accompanies each movement.⁶

Yoga has been effective with patients who have mild to moderate hypertension. In another group who were at risk of cardiovascular disease, resting systolic and diastolic blood pressure decreased after 20 weeks of yoga.⁶

**Method**

It was experimental study conducted in physiotherapy department of Krishna institute of medical sciences. women with 3rd trimester checked for presences of pregnancy induced hypertension and its stage. After collecting the complete sample size 20 women include in GROUP A i.e. musical therapy group and GROUP B i.e. musical and physiotherapy group by convenient sampling with random allocation of the subject. In GROUP A women received musical therapy in which they listen OMKAR mantra in a low voice 30 min for 7 days in a week till the delivery. In GROUP B patient received musical therapy and physiotherapy in which they received the combination musical and physiotherapy. For musical therapy they also listen OMKAR mantra same as group A for 30 min and in additional they practice yoga and pranayama as part of physiotherapy treatment. Yoga practices, including physical postures, breathing, and meditation were practice 30 min daily during study period.

**Outcome Measures**

**Systolic Blood Pressure**

**Table no 1: Comparison of pre and post systolic blood pressure between groups**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-Treatment Mean ± SD</th>
<th>Post-treatment Mean ± SD</th>
<th>‘P’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>144.9 ± 3.932</td>
<td>142.9 ± 3.939</td>
<td>0.4591</td>
</tr>
<tr>
<td>B</td>
<td>144.05 ± 3.220</td>
<td>136.05 ± 2.762</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

In the present study pre interventional means of systolic blood pressure144.05 ± 3.220 in Group B and144.9± 3.932 in Group A whereas post-interventional mean was 136.05 ± 2.762for systolic blood pressure in Group B and142.9 ± 3.939 in Group A respectively.

Inter group analysis of systolic blood pressure was done by using unpaired t test. Post intervention analysis showed significant difference between Group A and Group B (p<0.0001)

**Diastolic Blood Pressure**

**Table no 2: Comparison of pre and post diastolic blood pressure between groups.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-treatment Mean ± SD</th>
<th>Post-treatment Mean ± SD</th>
<th>‘P’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>94.75 ± 3.697</td>
<td>92.75 ± 3.697</td>
<td>0.4661</td>
</tr>
<tr>
<td>B</td>
<td>93.95 ± 3.154</td>
<td>85.6± 2.479</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
In the present study pre interventional means of diastolic blood pressure was 93.95 ± 3.154 in Group B and 94.75 ± 3.697 in Group A whereas post-interventional mean was 85.6 ± 2.479 for diastolic blood pressure in Group B and 92.75 ± 3.697 in Group A respectively.

Inter group analysis of diastolic blood pressure was done by using unpaired t test. Post intervention analysis showed extremely significant difference between Group A and Group B (p<0.0001)

**Pulse Rate**

Table No 3. Comparison of pre and post pulse rate between groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-Treatment</th>
<th>Post-treatment</th>
<th>'P' value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>85 ± 3.880</td>
<td>83 ± 3.880</td>
<td>0.5527</td>
</tr>
<tr>
<td>B</td>
<td>84.25 ± 4.038</td>
<td>76.7 ± 3.27</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

In the present study pre interventional means of pulse rate was 84.25 ± 4.038 in Group B and 85±3.880 in Group A whereas post-interventional mean was 76.7 ± 3.27 for heart rate in Group B and 83 ± 3.880 in Group A respectively.

Inter group analysis of pulse rate was done by using unpaired t test. Post intervention analysis showed very significant difference between Group A and Group B (p<0.0001)

Table no 4: Post-Post values of all outcome measures in between group A and group B

<table>
<thead>
<tr>
<th>MEAN ± SD</th>
<th>P-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>Group B</td>
</tr>
<tr>
<td>Group A</td>
<td>Group B</td>
</tr>
<tr>
<td>SYSTOLIC BLOOD PRESSURE</td>
<td>142.9 ± 3.939</td>
</tr>
<tr>
<td>DIASTOLIC BLOOD PRESSURE</td>
<td>92.75 ± 3.697</td>
</tr>
<tr>
<td>PULSE RATE</td>
<td>83 ± 3.880</td>
</tr>
</tbody>
</table>

**Discussion**

Being pregnant is one of the most special and magical experience a woman can have in her lifetime. During pregnancy she can experience many changes in her body be it psychological or physiological. These changes give her many pleasant and unpleasant experiences. Pregnancy may be a magical experience but there are some risk factors that can occur along the way which may cause a life threatening situation.

Pregnancy induced hypertension is one of the most common medical complication, it causes high risk pregnancy period. The pathology is still unknown. It could be pre-existing or can appear for the first time during pregnancy. The identification of hypertension and effective management may help to save the mother and the baby and reduce the complication during delivery.

Hypertension during pregnancy leads to premature aging of placenta, the vasoconstriction of the blood vessels occur leading to reduced blood flow. Due to impaired blood supply some changes occur into the maternal blood vessels resulting in anatomical and functional changes in the placenta and all of these put the fetus into danger. Glomerular endotheliosis, swelling of endothelial cells, reduced renal blood flow and glomerular filtrate rate can occur. In several cases the intense anorexia can produce extensive arterial thrombosis leading to bilateral renal cortical necrosis.

Intense vasospasm causes periportal hemorrhagic necrosis of the liver occurs due to thrombosis of arterioles, focal necrosis of hemorrhage in the myocardium may affect the conducting system leading to heart failures, and there is evidence of edema or hemorrhagic bronchopneumonia.

In this study, 40 subjects were assessed for eligibility, out of which 40 completed the study. Pre-treatment outcome measure for pregnancy induced hypertension is systolic blood pressure, diastolic blood pressure and pulse rate.

In study has shown clinically significant changes in systolic blood pressure, diastolic blood pressure and pulse rate. These findings suggest that combination of musical therapy and physiotherapy is effective in reducing in high blood pressure. Calming and soothing music helps to smile, sing and to relax and reduce stress.
during pregnancy ¹.

Musical therapy includes OMKAAR MANTRA in low voice. The mantra contains various rhythmic frequencies of vibrations which help to relax the mind and decrease the stress level. Physiotherapy includes the combination of Yoga and Pranayama.

Yoga and pranayamas are beneficial for the treatment of cardiopulmonary diseases, autonomic nervous system imbalances and psychological or stress related disorders. Slow pranayamic breathing is one of the most practical relaxation techniques. Pranayam play a role in controlling systemic vascular resistance and heart rate ¹⁷.

The word ‘yoga’ is derived from the Sanskrit verb ‘yuj’ which means the Union. This refers to the union of the individual consciousness with that of the Universal Divine consciousness that can be achieved by the wide variety of practices that range from yogasanas, pranayamas, mudras, kriyas, relaxation and medication techniques ¹⁸.

Yoga typically combines stretching exercises and different poses with deep breathing and meditation, yoga is designed to stretch and tone muscles and to keep the joints and spine flexible. Some suggest that bending. Twisting and stretching movements also massage the internal organs and glands ⁶.

Yoga has been effective with patients who have mild to moderate hypertension ⁶. Regular practice of yoga and pranayama with the combination of musical therapy is very helpful to decrease the blood pressure during pregnancy.

Group B was more significant as compared to group A, group A was not given yogasanas and pranayamas for stress management. Group A was given only musical therapy while group B was given combination of physiotherapy and musical therapy.

The treatment of group A was less effective because it includes only musical therapy in which the patient was supposed to perform ‘Omkaar mantra’ for 30 minutes a week as therapy. While group B was given the combination of musical therapy and physiotherapy for 30 minutes.

Hence the alternate hypothesis is proved because there is a significant change in between two groups on pregnancy induced hypertension.

The limitations of the study: 1. The study can be done in other areas of the country. 2. The study is done in Asian race. 3. The study is limited to a small sample size which makes it difficult to extrapolate the result. 4. This study is limited to 3rd trimester of pregnancy. 5. This study was limited to shorter duration follow up period.

Suggestion and recommendation of the study: 1. This study should be conducted with large number of people. 2. This study can be done on longer duration with longer follow up period for the assessment of long term benefits.

Conclusion

Regular practice of yogasanas and pranayama is beneficial for health. Music is effective to reduce stress, anxiety; but combination musical therapy and physiotherapy is more effective to reduce systolic and diastolic pressure, pulse rate which is increased due to stress and anxiety.

Conflicts of Interests: The authors declare that there is no conflict of interest concerning the content of the present study.

Source of Funding: Krishna Deemed To Be University, Karad. Maharashtra, India.

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Profile HIV Infected Children at an ART Centre of Karnataka

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Abstract

Introduction: Children (<15 years) account for 6.54%, while females contributed around two fifth (40.5%) of total HIV infections. During 2016-17, 53721 HIV exposed live birth were reported out of which 86.7% received ARV drug. Despite this, HIV infection rates have been on the increase among women and their infants in some states of India, probably due to complex social and cultural issues that limit the effectiveness of prevention programmes. Often, children from families affected by AIDS are left orphans and many drop out of school to care for sick parents or to earn a livelihood.

Methodology: Data was collected from the ART Centre of Uttarkannada District. Record based data from the year 2008 to 2018 April of pediatric age group i.e. from 0-18 years was considered for the study. Age, status of the case and treatment related variables were obtained from the centre. The period of study was two months (April and May 2018).

Results: Total registered cases were 189 among which 54.5% were boys and 45.5% were girls. 139(73.5%) were on treatment. Majority i.e. 31.7% belonged to age group between 0-5 years. Loss to follow up and Opting out of treatment constituted around 8% of the cases.

Recommendation: Scaling up of infant diagnostic services and strengthening programs to retain HIV exposed children in care and ensure timely testing for HIV infection.

Keywords: HIV, CHILDREN, ART, KARNATAKA

Introduction

HIV/AIDS not only affects children personally but also affects their families and parental care. The total number of People Living with HIV (PLHIV) in India was estimated at 21.17 (17.11 lakhs—26.49 lakhs) in 2015 compared with 22.26 lakhs (18.00 1&-27.85 lakhs in 2007)¹. Children (<15 years) account for 6.54%, while females contributed around two fifth (40.5%) of total HIV infections (NACO 2016-17 report)². More than 90% of the HIV infections in children are the result of maternal-to-child transmission (MTCT).³ The MTCT rate ranges from 20% to 45% in the developing world.⁴

In India during 2016-17, out of the annual target 140 lakhs, 76.2 lakhs of pregnant women tested for HIV AIDS 5233 were HIV positive as new cases and out of which 4935 (94.3%) initiated lifelong ART, the known HIV positive pregnant women availed ICTC service during this period is 1,172. During 2016-17 (till September 2016), 53721 HIV exposed live birth were reported out of which 4,651 (86.7%) received ARV drug. Though this, HIV infection rates have been on the increase among women and their infants in some states of India, probably due to complex social and cultural issues that limit the effectiveness of prevention programmes.

Effective treatment, early diagnosis and public health campaigns have contributed to a 39% decrease in new HIV infections between 2000 and 2016 (WHO HIV/AIDS Fact sheet, 2018)⁵. The complex social...
stratification in India increases the risk of HIV infection in vulnerable groups majorly women and children. Often, children from families affected by AIDS are left orphans and many drop out of school to care for sick parents or to earn a livelihood. Lack of information on STIs and HIV, peer pressure and lack of access to clinical care increases their vulnerability and risk to HIV infection. Many affected children are left without even the rudiments of healthcare due to discrimination and poor public health system.

The goal of ‘zero new HIV infections, zero discrimination and zero AIDS-related deaths’ made on Worlds AIDS day in 2010 to be more realistic if the barriers to prevention, treatment and care for HIV women and children are managed well. It is the need of the hour to know profile of HIV infected children. Hence this study was planned at an ART center in Karnataka.

Materials and Method

Data was collected from the ART Centre of Uttarkannada District. Record based data from the year 2008 to 2018 April of pediatric age group i.e. from 0-18 years was considered for the study. Age, status of the case and treatment related variables were obtained from the centre. The period of study was two months (April and May 2018). All the cases registered at the centre whose data were available were included for the study. Data analysis done in the form of tables and percentages.

Findings

Total number of Children (0-18 years) registered at the ART Centre during 2008-18 was 189 among which 54.5% were boys and 45.5% were girls (Table 1). At the ART Centre, 139(73.5%) were on treatment i.e. 75.7% of boys registered and 70.9% of registered girls. Among the 189 registered cases majority i.e. 31.7% belonged to age group between 0-5 years (Table 2). Most of the cases registered were from KUMTA Taluka constituting 14.2% followed by SIRSI with 13.7% cases and the least was seen in JOIDA Taluka with around 2.6% (Table 3). Among the 139 started on ART at the Centre, 73 (52.5%) of them were alive on ART, 17 (12.2%) were reported dead, 38 of them took transfer to other ART Centre. Loss to follow up and Opting out of treatment constituted around 8% of the cases (Table 4). Table 5 shows the status of children who were not initiated on ART.

**TABLE 1: Children registered and Treatment started at ART Centre**

<table>
<thead>
<tr>
<th>Year</th>
<th>Registered</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>2008</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>2009</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>2010</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>2011</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>2012</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>2013</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>2014</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2015</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>2017</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>2018</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>86</strong></td>
</tr>
</tbody>
</table>

**Table 2: Age wise distribution of cases registered at art centre**

<table>
<thead>
<tr>
<th>AGE</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>7</td>
<td>10</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>02–05</td>
<td>24</td>
<td>19</td>
<td>43</td>
<td>22.7</td>
</tr>
<tr>
<td>5–10</td>
<td>27</td>
<td>29</td>
<td>56</td>
<td>29.6</td>
</tr>
<tr>
<td>10–15</td>
<td>35</td>
<td>18</td>
<td>53</td>
<td>31.2</td>
</tr>
<tr>
<td>&gt;15</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>10.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>86</strong></td>
<td><strong>189</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 3: Taluk wise distribution of cases registered at art centre

<table>
<thead>
<tr>
<th>TALUKA</th>
<th>MALE</th>
<th>FEMALE</th>
<th>TOTAL</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>KARWAR</td>
<td>10</td>
<td>11</td>
<td>21</td>
<td>11.1</td>
</tr>
<tr>
<td>ANKOLA</td>
<td>7</td>
<td>13</td>
<td>20</td>
<td>10.5</td>
</tr>
<tr>
<td>KUMTA</td>
<td>19</td>
<td>8</td>
<td>27</td>
<td>14.2</td>
</tr>
<tr>
<td>BHATKAL</td>
<td>12</td>
<td>12</td>
<td>24</td>
<td>12.6</td>
</tr>
<tr>
<td>HONNAVARA</td>
<td>9</td>
<td>12</td>
<td>21</td>
<td>11.1</td>
</tr>
<tr>
<td>SIDDAPURA</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>3.7</td>
</tr>
<tr>
<td>SIRSI</td>
<td>15</td>
<td>11</td>
<td>26</td>
<td>13.7</td>
</tr>
<tr>
<td>MUNDGOD</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>4.2</td>
</tr>
<tr>
<td>YELLAPUR</td>
<td>9</td>
<td>6</td>
<td>15</td>
<td>7.9</td>
</tr>
<tr>
<td>HALIYAL</td>
<td>9</td>
<td>6</td>
<td>15</td>
<td>7.9</td>
</tr>
<tr>
<td>JOIDA</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>2.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>103</td>
<td>86</td>
<td>189</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4: Present status of treatment initiated cases at art centre

<table>
<thead>
<tr>
<th>STATUS</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIVE ON ART</td>
<td>39</td>
<td>34</td>
<td>73</td>
</tr>
<tr>
<td>DIED</td>
<td>10</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>TRANSFER OUT</td>
<td>22</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>LFU(lost to follow up)</td>
<td>6</td>
<td>3</td>
<td>09</td>
</tr>
<tr>
<td>OPTED OUT</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>78</td>
<td>61</td>
<td>139</td>
</tr>
</tbody>
</table>

Table 5: Present status of cases registered and not on treatment at art centre

<table>
<thead>
<tr>
<th>STATUS</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIVE ON PRE ART</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>DIED</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>TRANSFER OUT</td>
<td>7</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>LFU(lost to follow up)</td>
<td>13</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>OPTED OUT</td>
<td>01</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Negative after 18 months</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
</tbody>
</table>

Discussion

Paediatric HIV infection is worldwide public health challenge disproportionately affecting children in the poorest parts of the world. In our study the enrollment for boy to girl ratio was 1.2:1. A study conducted in Nepal (child discussion) had enrolled ratio of boys to girl as 2.5:1. Only 4.7% of the cases in this study were diagnosed before 2 years of age. This suggests that there is a delay in making diagnosis of paediatric HIV infection. About half of HIV infected children die undiagnosed before their second birthday. Most of them will have acquired HIV in utero or around the time of birth. More than half (50-60% of the children) develop symptoms early in life and, in the absence of timely diagnosis and effective treatment, die by the time they are two years old. Early diagnosis and initiation of ART in children < 2 years of age is of utmost importance since failure to do so may result in rapid progression of disease and early mortality. Majority i.e. 31.7% belonged to age group between 0-5 years, this also shares similarities with the other studies done in India and Nepal by Madhivan et al, Gomber et al and Poudel et al.

Population of Uttarkannada is around 14.5 Lakhs as per 2011 census. Kumta and Sirsi taluka constitute more than 3 lakh Population. In our study highest number of cases were registered from these two Talukas and least cases from Joida taluka which has population less than 55,000. It was seen that 28% of transfer out cases were reported at the ART, this may because of establishment of another ART at Sirsi taluka, for the benefit of patients in and around the taluka.

In our analysis it was found that almost 21% was the mortality among the children in whom ART treatment was initiated. Among these majority were boys (59%) as compared to girls, similarly a study conducted by Ullas Ulahannan et al in Karnataka also showed increased mortality (70%) among males. Loss to follow (LTF) and opt out from treatment was seen among 8% of children. It may be due to in some cases children will be with the care takers due to death of their parents, and the need for follow up might be neglected by the care takers. Loss to followup of mothers and their children challenges the potential effectiveness of the PPTCT program. Even though PPTCT programs report reduced rates of infection among infants tested at 2 months of age, there is limited priority on retention of HIV exposed infants in care. A study from Maharashtra reports that 10.9% and
19.6% of women were LTF before and after delivery. Significant factors associated with LTF included poor education, low economic status, and registration beyond 20 weeks of pregnancy. Although current regimens have substantially and dramatically decreased AIDS related opportunistic infections and deaths, retention in care with lifelong adherence is imperative to achieve and maintain viral suppression as well as prevent drug resistance.

**Conclusions and Recommendations**

Promote counseling, emotional support, and skill building for coping mechanisms for mothers living with HIV/AIDS. Scaling up of infant diagnostic services and strengthening programs to retain HIV-exposed children in care and ensure timely testing for HIV infection. Ensure continued followup of exposed babies for their full participation in postnatal care. Strengthen mechanisms for integrating PPTCT across private sector by means of promoting public–private partnership. Capacity building and sensitization of community level workers on HIV prevention. A comprehensive study including sociodemographic profile, anthropometric data, biochemical data, clinical signs, and dietary intake data among the same group of children will give a better insight into the situation.

**Conflict of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** No intervention was done in the study and only the data was analysed retrospectively.

**References**

14. Pandittrao M, Darak S, Kulkarni V, Kulkarni S, Parchure R. Sociodemographic factors associated with loss to followup of HIV infected women attending a private sector PMTCT program in Maharashtra, India. AIDS Care 2011;23:593600
Perceived Trigger Factors and Control Measures among Patients with Asthma

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Abstract

Background: Asthma patients have a high exposure to different allergens, but have little awareness concerning their specific trigger factors.

Method: A quantitative approach using descriptive research design was conducted among 100 asthma patients were selected through convenience sampling. A trigger factor checklist and a semi-structured questionnaire regarding knowledge level on asthma control were administered. The data analysis was done by appropriate descriptive statistics and principal factor analysis.

Results: In this study, 91% of asthma patients reported that home dust and mites was their major trigger factor, 66% of participants reported that once pre-sensitized to home dust mite it always triggered asthma attacks. The study revealed that home dust mites was the most predominant trigger factor identified in 45% of cases and other interrelated trigger factors noted are climate, pollen and stress/anxiety. We also found that 25% of participants had poor knowledge about asthma control. Majority of asthma patients were unable to pinpoint a specific trigger factors.

Conclusion: If asthma patients can identify and avoid home dust / mites then majority of asthma sudden attacks can be prevented.

Keywords: Asthma, trigger factors, control measures, factor analysis

Introduction

Asthma is a chronic inflammatory disease of the airways presenting in all ages with severity ranging from outpatient treatable exacerbations to those needing ICU admission and ventilators support. Often it is a chronically debilitating disease affecting quality of life even in between exacerbation. In people with asthma the bronchi become overly reactive and more sensitive to all kinds of asthma triggers.1

Globally asthma is one of the most common chronic diseases, and it is estimated that 334 million people worldwide currently have asthma.2 This chronic disease affecting 1-18% population in different countries in all age groups.3 A study estimated that the prevalence of asthma is to be 2.05% among those aged >15 years, with a national burden of 18 million asthmatics.4 In Kerala prevalence of asthma among males was 2.44% while that of females is 3.14%.5

Asthma triggers can be allergic such as dust mites or non-allergic such as exercise, viral infections, smoke or other irritants. It is important to identify both allergic and non-allergic triggers and develop strategies to avoid...
exposures. Due to the influence of the triggering factors most of asthmatics experiences shortness of breath, nocturnal coughing, wheezing, difficulty breathing, and chest tightness during the asthma attack.

Avoidance of trigger factors that exacerbate asthma is an important part of disease control, particularly if the disease is refractory to usual treatment. Even if the trigger factors are not completely avoidable, attempts to reduce their effects may still be possible. Medical advice would then depend on knowledge of the types and range of probable trigger factors for in asthma. However, most prior studies on trigger factors focused on one or a few trigger factors. The influence on knowledge and health outcomes is not fully examined. Poor awareness and knowledge among the patients can influence the progression of asthma. The investigators believe that assessment of triggering factors and asthma control measures are important for asthma management.

Materials and Method

A quantitative approach using descriptive research design was used for the study. The study was conducted in Amrita Institute of Medical Sciences in Kerala. Ethical clearance was obtained from the institutional ethical committee prior to the data collection. Certain refinement was made in the tool based on the pilot study conducted and the investigators collected the clinical sample through convenience sampling technique. A 100 patients with asthma participated in the study. Informed consent was obtained from each participant in the study.

The socio demographic and clinical data were collected using a semi-structured interview schedule. A trigger factor checklist containing 18 trigger factors were given identify their perceived triggers and graded according to the patients perception. The eighteen trigger factors are home dust/mites, climate, pollen allergy, molds, stress/anxiety/emotions, food/additives, animal furs/dander’s/hairs/ feathers, exercises, infections, air pollutants, drugs, cockroaches, air conditioners, citrus fruits, job related chemical exposure, over eating, crowded place and insufficient sleep. The semi-structured questionnaire containing 25 questions designed to measure their level of asthma control which was modified from GINA (2010) guidelines was given to the patients and each subject queries were addressed on a 1:1 basis to avoid inconsistency in data collection. After reading each statement the patients were asked to select a suitable response.

The Principal factor analysis method was used to identify relationship between various trigger factors and to identify the predominant trigger factor. The statistical analysis was performed using SPSS statistical software 17.0 version of Windows.

Results

![Bar graph showing percentage of trigger factors perceived.](image)

Figure 1: Bar graph showing percentage of trigger factors perceived.
The table shows that home dust and mites are the most frequent triggers accounting for about 91% cases of asthma attacks. Trigger factors such as climate, air pollution and job related chemical exposure was about 77%, 64% and 52% respectively. Stress and anxiety (48%), air conditioner (45%), pollen (37%) were the other culprits in the study. Mold and animal trigger factors suspected 34% of the time. Trigger factors like over-eating and insufficient sleep were reported in about 10% of the cases. Trigger factors such as food, infections, exercise and crowded places reported 25%, 20%, 16% and 15% respectively. Cockroaches, drugs and citrus fruits triggers were also involved in the study which showed around 10%.

**Table 1: Grading percentage of triggers factors perceived by the sample.**

<table>
<thead>
<tr>
<th>sl no</th>
<th>Trigger factors</th>
<th>Very often (%)</th>
<th>Sometimes (%)</th>
<th>Rarely (%)</th>
<th>Never (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Home dust /mites</td>
<td>66</td>
<td>22</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Climate</td>
<td>31</td>
<td>41</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>Pollen allergy( trees, grass, flowers, weeds)</td>
<td>11</td>
<td>20</td>
<td>6</td>
<td>63</td>
</tr>
<tr>
<td>4</td>
<td>Molds</td>
<td>16</td>
<td>14</td>
<td>6</td>
<td>64</td>
</tr>
<tr>
<td>5</td>
<td>Stress/anxiety</td>
<td>18</td>
<td>23</td>
<td>7</td>
<td>52</td>
</tr>
<tr>
<td>6</td>
<td>Any foods / food additives (monosodium glutamate, tartazine)</td>
<td>5</td>
<td>12</td>
<td>8</td>
<td>75</td>
</tr>
<tr>
<td>7</td>
<td>Animal fur/ dander’s/ hairs/ feathers</td>
<td>18</td>
<td>11</td>
<td>5</td>
<td>66</td>
</tr>
<tr>
<td>8</td>
<td>Exercises</td>
<td>2</td>
<td>10</td>
<td>4</td>
<td>84</td>
</tr>
<tr>
<td>9</td>
<td>Acute Infections (viral and bacterial)</td>
<td>5</td>
<td>10</td>
<td>5</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>Air pollutants ( smoke, perfumes, aerosols, spray, oxidants, sulphadioxide)</td>
<td>28</td>
<td>32</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>11</td>
<td>Drugs ( beta blockers, NSAIDS, aspirin)</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>89</td>
</tr>
<tr>
<td>12</td>
<td>Cockroach</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>88</td>
</tr>
<tr>
<td>13</td>
<td>Air conditioners</td>
<td>24</td>
<td>14</td>
<td>7</td>
<td>55</td>
</tr>
<tr>
<td>14</td>
<td>Citrus fruits</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>15</td>
<td>Job - related chemical exposure</td>
<td>18</td>
<td>29</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td>16</td>
<td>Over eating</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>87</td>
</tr>
<tr>
<td>17</td>
<td>Crowded places</td>
<td>3</td>
<td>11</td>
<td>1</td>
<td>85</td>
</tr>
<tr>
<td>18</td>
<td>Insufficient sleep</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>87</td>
</tr>
</tbody>
</table>

The table 1 illustrates the proportion according to the grading of occurrence in eighteen trigger factors. Out of 18 trigger factors studied for the 100 patients a substantial proportion (66%) of people reported that dust/mites always triggers the asthma attacks, whereas about 9% of patients never had dust/mites triggered attacks of asthma. On the other hand, trigger factors with citrus fruits accounts the least factor with only 2% of participants reported very often asthma attacks.

The study also identified that number of trigger factor varies from patient to patient. About 15% of asthma patients have minimum 3 trigger factors.
Principal Factor Analysis

The factor analysis disentangles complex interrelationships among variables and identifies which variables ‘go together ‘as unified concepts. The Kaiser Meyer Olkin (KMO) value measured 0.572 which is recommended value to proceed for principal factor analysis. Bartlett’s Test of Sphericity is conducted to test the strength of relationship among variable. The obtained significance level is .000 which is less than 0.05 to get a correlation matrix. The Communalities are extracted by utilizing principal component analysis.

Table 2: Principal component analysis and variance explained

<table>
<thead>
<tr>
<th>Trigger Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>Home dust/Mites</td>
<td>2.858</td>
<td>15.875</td>
</tr>
<tr>
<td>Climate</td>
<td>1.798</td>
<td>9.991</td>
</tr>
<tr>
<td>Pollen allergy</td>
<td>1.632</td>
<td>9.069</td>
</tr>
<tr>
<td>Molds</td>
<td>1.434</td>
<td>7.967</td>
</tr>
<tr>
<td>Stress/Anxiety</td>
<td>1.293</td>
<td>7.184</td>
</tr>
<tr>
<td>Food/Additives</td>
<td>1.181</td>
<td>6.561</td>
</tr>
<tr>
<td>Animal fur/danders/hairs/feathers</td>
<td>1.05</td>
<td>5.833</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

Table 2 illustrates the total variances explained by each of the extracted components to represent the variations in each of the 18 variables. Each variable is standardized with the maximum variance for each as 1.0. An eigenvalue is obtained and value 1.0 or greater is retained in the study which reflects the proportion of variances explained by the component.

In the presented study seven components out of 18 components with eigenvalue ≥ 1.0 explain almost 75% the total variances. Dust/Mites component whose value is > 1.0 indicates a strong relationship exists among the group of variables under the study.

Table 3: Rotated Component Matrix

Table 3 shows rotation of 7 extracted components whose eigenvalues are greater than 1.0 are loaded and the values greater than .30 gives a good interpretation to the study. A correlation cut off value of .40 is appropriate but can range from-1 to +1. The guidelines for interpreting factor loadings as: .71= excellent, .63= very good, .55= good, .45= fair and .32= poor (Comrey and Lee’s, 1992).

The home dust/mites have very good relationship with grade Pollen (.628) and also have good relationship with animal fur/dander’s/hairs (.581), cockroaches (.566) and job related chemical exposure .541. The home dust/mites have fair relationship with molds (.467), air pollutants (.447) and Air conditioners (.428).

In addition to that climate shows a good relationship with exercise (.510), citrus fruits (.537) and crowded places (.522). Pollen reported a good relationship between insufficient sleep (.576) and molds showed a good correlation with crowded places (.553). Stress/anxiety/ emotions showed a good correlation between exercises (.536) and over eating (.590).
**Table 3: Rotated Component Matrix**

<table>
<thead>
<tr>
<th>Component Matrix</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Components</strong></td>
<td><strong>Component</strong></td>
</tr>
<tr>
<td>Home dust/Mites</td>
<td>-0.47</td>
</tr>
<tr>
<td>Climate</td>
<td>-0.546</td>
</tr>
<tr>
<td>Pollen Allergy</td>
<td>0.628</td>
</tr>
<tr>
<td>Molds</td>
<td>0.467</td>
</tr>
<tr>
<td>Stress/Anxiety/emotions</td>
<td>-0.453</td>
</tr>
<tr>
<td>Food/Additives</td>
<td>0.55</td>
</tr>
<tr>
<td>Animal fur/danders/hairs/feathers</td>
<td>-0.419</td>
</tr>
<tr>
<td>Exercises</td>
<td>0.51</td>
</tr>
<tr>
<td>Infections</td>
<td>-0.592</td>
</tr>
<tr>
<td>Air pollutions</td>
<td>0.447</td>
</tr>
<tr>
<td>Drugs</td>
<td>-0.578</td>
</tr>
<tr>
<td>Cockroaches</td>
<td>0.566</td>
</tr>
<tr>
<td>Air conditioners</td>
<td>0.428</td>
</tr>
<tr>
<td>Citrus fruits</td>
<td>0.537</td>
</tr>
<tr>
<td>Job related chemical exposure</td>
<td>0.514</td>
</tr>
<tr>
<td>Over eating</td>
<td>0.59</td>
</tr>
<tr>
<td>Crowded places</td>
<td>0.522</td>
</tr>
<tr>
<td>Insufficient sleep</td>
<td>0.576</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

**Knowledge level of control Measures**

(n=100)

![Bar chart showing knowledge level on asthma control measures](image)

*Figure 2: Knowledge level on asthma control measures*
The chart shows the knowledge level of asthma control measures in 100 patients. The study showed that 23% participants thought that their asthma control measure was poor and 8% of participants bought that they have good control to prevent exposure to specific allergens. On the contrary, the study showed that about 69% of patients have a moderate control in preventing acute attacks of asthma.

**Discussion**

This is one among the few studies which evaluated multiple asthma trigger factors in asthma patients. A similar study conducted by Kay Choong, Jason Phual, Tow Keang Lim (2009) to identify the trigger factors in asthma suggests that trigger factors were more common in asthma (93.8%). The study found that there are various trigger factors among asthma patients. The study concluded that knowledge of trigger factors may be useful in optimizing disease management.

The result highlighted that, about 91% of asthma patients in the study reported that home dust and mites were their major triggering factor. The 66% of participants reported that exposure to home dust mites always triggers asthma attacks. All the asthma patients reported at least one trigger factor. A maximum of fourteen asthma triggers identified in one patient.

This findings are comparable to the study conducted by Mao D, Tang R, Wu R, Hu H, Sun L, Zhu H, et al (2014) to determine the clinical profiles and prevalence trends in the characteristics of patients with asthma in Beijing shows that the top 5 allergens were dust (9.1%), mites (8.8%), seafood (8.2%), pollen (6.3%), and animal fur (6%).

As the frequency of home dust and mites was higher, an exploratory factor analysis has been done to identify which variables go together. The study revealed that out of 18 triggers, the first 7 trigger factors retained in the study which represents a relationship between other trigger factors. The retained trigger factors are home dust/ mites, climate, pollen allergy, molds, stress/ anxiety, food/ additives, animal fur/dander’s/ hairs/ feathers. The seven retained trigger factors were again subjected to principal component analysis to get a rotated component matrix which explains the relationship between other trigger factors. The home dust mites contains eight variables or 44.44% of the total 18 trigger factors included in the study and accounts for the most predominant trigger factor which have very good relationship with pollen and good relationship between animal fur/dander’s/ hairs, cockroaches and job related chemical exposure. Moreover it has fair relationship with molds, air pollutants and Air conditioners.

Moreover, the study also finds out the knowledge level of asthma control measures instituted by the patients. The investigators noted that around 25 percent of participants had poor knowledge about asthma control measures and 69% of participants still need further education to better understanding about their disease. The 88% of asthma patients in our study was unable to pinpoint their exact trigger factor which exacerbates their asthma. A similar study result is revealed in a study conducted by Ozturk AB, Ozyigit PL, Kostek O, Keskin H (2015) shows that knowledge of asthma was very low in elderly patients and usual asthma care was largely insufficient.

**Conclusion**

Identifying asthma triggers is a sort of cost effective secondary prevention. The study indicates that home dust/mites are the most common and predominant trigger factor which plays a crucial role in asthma well-being. If this trigger factor is identified and avoidable majority of asthma sudden attacks can be prevented.

Moreover a good asthma control is possible only by identifying and avoiding all the trigger factors. It is a herculean task for the consulting doctor to identify each patients trigger factors and to provide avoidance counseling. More studies should be implemented on each asthma trigger factors and mass education should be done to the public through multifaceted programmes.

**Funding:** No funding sources

**Conflict of interest:** None declared

**Ethical approval:** The study was ethically approved by institutional ethical committee.

**References**


Radiation Induced Oral Mucositis: Onset, Severity and Associated Risk Factors among Head and Neck Cancer Patients- A Prospective Observational Study

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³Radiotherapy, Consultant, Radiation Oncology, Sri Shankara Cancer Hospital and Research Centre, Bangalore

Abstract

Objectives: This study aimed at describing the onset, severity of radiation induced oral mucositis and identifying the factors associated with the development of oral mucositis among patients with head and neck cancer.

Method: This prospective observational study was conducted on 30 head and neck cancer patients who were scheduled to undergo radiation therapy and consented to participate. Data was collected by using a baseline Performa and WHO Oral Toxicity scale. The patients were followed up during the entire course of radiation therapy and were weekly monitored for the development of oral mucositis. The data was analysed using descriptive and inferential statistics.

Result: The present study findings revealed that oral mucositis developed in all head and neck cancer patients receiving radiation therapy with a predominance of grade 3 mucositis. Therapy related factors including cumulative and fractionated radiation dose and receipt of concurrent chemotherapy as well as patient related factors such as previous smoking and tobacco chewing habits were associated with a high risk of oral mucositis.

Conclusion: The study findings suggest that oral mucositis is a common acute reaction during head and neck irradiation and appropriate risk based interventions are needed to reduce the severity of mucositis.

Keywords: Radiation induced oral mucositis, onset, severity and risk factors

Introduction

Radiotherapy plays an important role in the treatment of head and neck cancer and is an effective treatment modality to kill cancer cells and to control tumour growth. Radiotherapy is used alone or in conjunction with surgery or chemotherapy. Evidences show that multimodal cancer therapy or aggressive single modality increases the tumour control and cancer survival at an expense of increased patient morbidity and acute side effects¹. Patients undergoing radiation receive a succession of fractionated radiation doses, which in cumulative doses can trigger multiple pathways to initiate mucosal injury². The rate of mucosal damage is directly related to the rate at which cells divide and hence normal tissues with rapid cell proliferation, such as mucous membranes and skin epithelium are at a greater risk for developing radiation induced injury³.

Oral mucositis is one of the most common complications that head and neck cancer patients experience during radiotherapy, with an incidence rate of nearly 100 %⁴. Radiation induced oral mucositis is defined as a reactive inflammation-like process of the oral and oropharyngeal mucous membranes and tongue after radiation exposure⁵. The severity of mucositis is determined by fractionated and cumulative dose, volume of irradiated tissue⁶ and the severity increases throughout the course⁶. Oral mucositis presents as erythema of the oral mucosa in the first 2–3 weeks of
radiation therapy and progresses to ulceration and pseudo membranes as the dose of radiation increases\(^7\). A prospective study conducted on 135 head and neck cancer patients receiving radiation therapy reported an incidence of mucositis grade 2, 3, and 4 in 82% of patients and ulcerations were initiated at a mean of 14.6 radiation fractions\(^8\).

Mucositis causes significant pain and functional changes such as difficulty in speaking, swallowing and dysguesia\(^9\). Oral mucositis pain along with functional changes interfere with the patient’s ability to eat and drink and can lead to weight loss predisposing them to secondary infections and nutritional deficiencies. Hence Radiation-induced oral mucositis has also a significant economic impact due to costs associated with pain management, liquid diet supplements, gastrostomy tube placement or total parenteral nutrition, management of secondary infections and hospitalizations\(^10, 11\). Furthermore, patients with severe mucositis are at higher risk of unplanned breaks/delays in radiation therapy, adversely affecting tumour control and treatment outcomes\(^8\).

Understanding the risk factors of oral mucosal reactions could facilitate accurate treatment plans to minimize the incidence and severity of reactions. Despite an increased frequency and profound clinical impact, the risk factors of oral mucositis in head and neck cancer patients have not been well defined. Currently many factors have been identified to have an association with mucositis and include poor oral hygiene and periodontal disease, chronic alcohol consumption, cigarette smoking, hypo salivation, low body mass index \(\text{BMI} < 18.5\), age, gender, concurrent diseases such as diabetes mellitus\(^13\), tumour location, a cumulative radiation dose 5000 cGy, and concomitant chemotherapy \(^11\).

In the current study, interrelationship between patient characteristics, therapy related factors, and the occurrence of oral mucositis was statistically analyzed. Since oral mucositis is one of the most frequent dose limiting complications of radiation therapy in head and neck cancer patients, identifying the risk factors will be of great value to the researchers, health care planners and care providers in planning more effective individualized risk based treatment for patients.

**Materials and Method**

The study employed a descriptive approach and histopathologically confirmed patients of head and neck cancer scheduled to receive radiotherapy were selected randomly as per the inclusion criteria. Exclusion criteria included patients younger than 18 years and patients with co morbid conditions (poorly controlled diabetes mellitus, hypertension, schizophrenia, bipolar disorders, and severe depression). The subjects were followed up during the entire course of radiation therapy.

**Data collection method**

Base line Performa was used to collect demographic data and WHO toxicity criteria was used to grade mucositis based on soreness, erythema, presence of ulcerations, ability to swallow solid food and the extent to which alimention is not possible. It categorized the severity of oral mucositis in to 4 grades on a 4 point scale ranging from 0-4. A single calibrated observer measured the grades at baseline before starting of radiation and every week till the end of therapy.

**Statistical analysis**

The data were typed into an Excel spreadsheet, and the software program used to obtain the statistical calculation was SPSS (Statistical Package for Social Sciences; IBM Corporation, Armonk, NY, USA) version 23.

**Results**

A total of 30 patients who fulfilled the eligibility criteria were included in the study and the study comprised of 77% males and 23% females. 57% of them were aged above 60 years and 23% of them were educated up to higher secondary. It was found that 56.66% were ex-smokers and 37% of them had a prior history of tobacco chewing. None of the respondents were smoking or using tobacco during the treatment course. Among the respondents who reported a history of smoking habits \(n=17\), 70% of them had a history of 10 pack years of smoking and the remaining \(30\%)\) had 11-20 pack years of smoking. Primary tumor sites were oral cavity \(63\%\), Laryngeal cavity \(23\%\), and pharyngeal cavity \(13\%\). A high proportion of tumours were classified as T2 \(44\%)\), followed by T3 \(30\%)\); T4 \(23\%)\) and T1 \(3\%)\) and 92% of the subjects had undergone surgical resection of the primary tumour site. Majority \(47\%)\) of the patients received a cumulative dose of 70 Gy and a fractionated dose of 2Gy per day \(73\%)\). 46.66% of the subjects received concurrent
chemotherapy during radiation and all of them received Cisplatin. Fifty percentages of the subjects had a normal BMI and 10% of the subjects were obese.

The analysis revealed that all the subjects developed radiation induced oral mucositis. Oral mucositis was categorized in to tolerable (grade1&2) and intolerable mucositis (grade3&4) based on the severity. It is observed that 43% developed grade 1 or 2 mucositis at the end of first week, and this percentage was increased to 76% by the end of second week, 83% by third week and all the subjects developed tolerable or intolerable mucositis by third week. Intolerable mucositis appeared by the end of second week in 7% of subjects and this percentage was increased gradually to 83% in sixth week and all the subjects who received radiation for 7 weeks developed intolerable mucositis by the end of the therapy. One subject developed grade 4 mucositis by the end of third week and the number of subjects with grade 4 mucositis was increased to 4 by the end of sixth week (fig1). Ryle’s tube feeding was started for all the subjects who developed grade 4 mucositis. Chi square analysis revealed a significant association between previous smoking and tobacco chewing habits, fractionated and cumulative radiation dose and receipt of concurrent chemotherapy with development of intolerable Mucositis (Table1).

![Percentage of radiation induced oral mucositis](image)

**Table No. 1: Association of risk factors with the development of oral mucositis**

<table>
<thead>
<tr>
<th>Baseline Variables</th>
<th>Grade 0</th>
<th>Intolerable mucositis Grade 3&amp;4</th>
<th>Chi-Value</th>
<th>df</th>
<th>Sig. (p-value)</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 to 60</td>
<td>5</td>
<td>8</td>
<td>0.032</td>
<td>1</td>
<td>0.858</td>
<td>NS</td>
</tr>
<tr>
<td>More than 60</td>
<td>6</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habit of Smoking</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>7</td>
<td>5.79</td>
<td>1</td>
<td>0.16</td>
<td>S</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habit of Pan chewing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7</td>
<td>4</td>
<td>5.44</td>
<td>1</td>
<td>0.02</td>
<td>S</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site of Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral cavity</td>
<td>9</td>
<td>10</td>
<td>3.450</td>
<td>2</td>
<td>0.178</td>
<td>NS</td>
</tr>
<tr>
<td>Pharyngeal</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laryngeal</td>
<td>2</td>
<td>5</td>
<td></td>
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</tr>
</tbody>
</table>
## Discussion

Oral mucositis, an important sequel of cancer therapy is characterized by generalized erythema, pseudo membranous degeneration, frank ulceration and haemorrhage. The incidence of oral mucositis has been described as ubiquitous among patients with head and neck cancer treated with conventional chemo radiation regimen. It has been observed that all the participants developed RIM during the course of treatment and grade 1 mucositis was present by the end of first week (10Gy) in 43% of subjects. Analysis revealed a higher incidence of oral mucositis between third and seventh week of treatment with a predominance of grade 3 mucositis.

The current study reveals that oral mucositis is a very common side effect of radiation therapy to head and neck. The study findings are correlated with the findings of a study conducted on 30 Head and Neck cancer patients receiving IMRT which described a significant increase in incidence and severity of oral mucositis starting from second week of radiation and a 100% incidence of radiation induced mucositis by third week of radiation with a predominance of grade 3 in fourth week. Similar findings are reported by a retrospective study consisting of 204 consecutive head and neck cancer patients in which oral mucositis occurred in 91% of subjects with a predominance of severe mucositis (66%) where as in the present study all the subjects (n=19) who continued the treatment for seven weeks developed grade 3 mucositis. The difference in incidence of intolerable mucositis may be due to the characteristics of the subjects as majority of subjects (63%) in the present study were with cancer of oral cavity and the volume of oral mucosa that is exposed to radiation has an influence on the severity of oral mucositis. The consistency of these findings substantiate the clinical significance of radiation induced oral mucositis.

A variety of patient related factors have been reported by the literature which can increase the potential of developing oral mucositis during chemo radiation including age of the patient, nutritional status, type of malignancy, prior or current history of tobacco or alcohol use. There are conflicting data relating to the effects of age on the development of mucositis. In general, younger patients appear to have an increased risk of chemotherapy-induced mucositis as cells with high mitotic activity are more sensitive to radiation. The current study did not find any association with age and the severity of mucositis. A prior history of smoking and tobacco chewing was found to be associated with a higher incidence of oral mucositis. The degree and duration of mucositis has been reported to be directly related to the treatment factors such as total dose and fraction, the volume of tissue treated and the receipt of concomitant chemotherapy. Cumulative and daily dose of radiation, previous smoking and tobacco chewing habits and receipt of concomitant chemotherapy were found to have significant association with an increased

### Table No. 1: Association of risk factors with the development of oral mucositis

<table>
<thead>
<tr>
<th>Treatment</th>
<th>10</th>
<th>6</th>
<th>5.12</th>
<th>1</th>
<th>0.023</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation + Chemotherapy</td>
<td>3</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose of Radiation per day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.8Gy</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0Gy</td>
<td>5</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1Gy</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2Gy</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4Gy</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Radiation dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 Gy</td>
<td>5</td>
<td>2</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>60 - 70 Gy</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 Gy</td>
<td>1</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The consistency of these findings substantiate the clinical significance of radiation induced oral mucositis.
risk of oral mucositis. The current study is limited to a small sample size of 30 and to a single setting. Even though there are conflicting views on patient related and therapy related risk factors of oral mucositis, defining the most important factors associated with occurrence of oral mucositis will be very useful to improve patients’ performance status during chemo radiation.

**Conclusion**

The present study confirms that oral mucositis is a common complication among head and neck cancer patients receiving radiation therapy with a higher incidence of severe mucositis from third to seventh week of radiation therapy. Identification of risk factors which can predict the severity of oral mucositis is useful in teaching the patients to detect the signs of mucositis and to overcome its effects.

**Conflict of Interest:** Nil

**Ethical Clearance:** The study was approved by the hospital ethical committee. Patients and their caregivers indicated their willingness to participate in the study after the details of the study had been explained to them. The subjects were also informed that they had the right to withdraw from the study at any time during the course of the study and written informed consent was obtained from them.

**Source of Support:** Self

**References**

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Effectiveness of a Multicomponent Intervention Programme on Blood Pressure of School Children

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Abstract

A study was conducted to find out the Effectiveness of a Multicomponent Intervention Programme on blood pressure of school children from selected schools of Kerala. Objectives of the study: (1) To find out the prevalence of pre hypertension and hypertension among school children. (2) To find out the effectiveness of a multi component intervention programme on blood pressure of school children

Methodology & Design:
Evaluative research approach with pre-test post-test control group design was used. 220 school children with pre hypertension in the age group of 13-16 years studying in 8th and 9th standards were included using simple random sampling in the study after screening 1328 children. A multi component intervention programme aimed at diet, exercise and lifestyle modifications of school children was then implemented.

Results:
The prevalence of pre systolic hypertension and pre diastolic hypertension among the study population was 265/1000 and 226/1000 respectively. The mean systolic blood pressure in the experimental group was significantly reduced after the multi component intervention programme (117.23 ± 5.36) compared to pre-test (119.25 ± 4.90). There was a significant association of systolic blood pressure of school children only with their class of study (χ²= 4.98, p=0.026).

Conclusion: Multi component intervention programme was effective in reducing the blood pressure of school children. The results of the present study is very much encouraging that similar programmes can definitely help in controlling life style diseases among children which is an emerging public health problem.

Keywords: Blood pressure, prehypertension, systolic blood pressure (SBP), diastolic blood pressure (DBP), school children, multicomponent intervention programme.

Introduction

Healthy children only can build a healthy nation. The foundation stone of many adulthood diseases including hypertension are laid in the childhood itself. It is well known that blood pressure (BP) increases consistently from infancy to adolescence. The lifestyle of the present generation is such that they are more prone to these types of conditions. Elevated blood pressure in children and adolescents may be an early expression of essential hypertension in adulthood. Hypertension has been identified as a major health problem globally and is an important risk factor for the development of coronary artery disease and stroke. It was estimated that around 1 billion of the adult world population was found to have hypertension in the year 2000 and this is expected to increase 1.56 billion by 2025. Though hypertension is mostly a problem of adults, its etiologic process starts in childhood. Studies have documented a 1-2% prevalence of childhood hypertension in the developed countries and 5-10% in the developing countries. Various Indian studies have also shown a prevalence which ranges from 0.96% to 11.4%. A cross sectional study was done to find the prevalence of sustained hypertension and pre hypertension among school children aged 11-17 years. A total of 1085 apparently healthy students from rural
and urban schools from northern India were examined. Hypertension was identified in 62 (5.9%) children and pre hypertension in 130 (12.3%). Rates of elevated BP were significantly higher (46.5% vs 17%, \( P<0.001 \)) among those with high body mass index (BMI) compared to those with normal BMI. The study concludes that nearly 20% of the school children had elevated blood pressures. Another study conducted among 24,842 school children from Kerala showed that 10.1% of children with normal weight, 17.34% of children with overweight and 18.32% of children who are obese were having hypertension. Another study was conducted to assess the prevalence of cardiovascular risk factors among school children of Delhi. They performed a cross-sectional survey among 485 school children studying in classes 6, 7 and 8 in two government and one private schools in New Delhi using convenience sampling. The prevalence of pre hypertension, stage 1 hypertension and stage 2 hypertension was 12.4%, 6.8% and 1.4% respectively. The study concludes that there is a notable prevalence (20.4%) of pre hypertension and hypertension among the study group.

It is very evident from these studies that the prevalence of hypertension and pre hypertension is a matter of concern as it is a childhood antecedent of serious cardiovascular disease conditions at a later age. It is important that clinical measures be taken to reduce these risks and optimize health outcomes. Early detection and prompt intervention are the two important strategies of reducing the morbidity and mortality rates of any disease conditions as well as in reducing the complications. The present study is one such attempt to find out the effectiveness of a school based intervention programme in reducing the future risks of hypertension among school children.

Objectives of the Study were to find out the prevalence of pre hypertension and hypertension among school children and to find out the effectiveness of a multi component intervention programme on blood pressure of school children

**Methodology**

The research approach was evaluative approach with pre-test post-test control group design. The study was done among children in the age group of 13-16 years from selected schools of Ernakulam district of Kerala State. The study was done on 220 (110 in experimental and 110 in control group) pre hypertensive school children selected randomly. Total enumeration method was used for the initial screening. Students from 8th and 9th standards (age 13-16 years) were taken from ten schools selected randomly from Ernakulam district. After the screening 1328 children, 381 children were found to have pre systolic hypertension or pre diastolic hypertension (Pre SHT/ Pre DHT) with blood pressure between 90th and 95th percentile or both. All these pre hypertensive children were considered for the study. The ten schools were then randomly divided into two groups (control and experimental). 110 children from each group of schools were selected randomly for the study. The multi component intervention programme (MCIP) was implemented for the experimental group. The blood pressure of both groups was checked at 4th month and 8th month and a reinforcement of the educational programme was done using an information leaflet only for the experimental group. Finally the blood pressure was done at 12th month for both the groups.

**Multi Component Intervention Programme (MCIP):** A systematically planned educational programme which provides information on childhood hypertension and the measures to be taken to prevent the development of hypertension (healthy lifestyle practices including diet, exercise, stress reduction etc.) with an intention to improve the knowledge, attitude and practice of school children on prevention of hypertension. This programme was implemented through direct teaching in two sessions of 45 minutes each and supplemented by information leaflet

**Ethical Clearance:** Ethical clearance was obtained from the Institutional Ethical Committee of Amrita Institute of Medical Sciences.

Data analysis was done on 210 samples (106 and 104 children respectively in the control and experimental groups, after attrition of 10 samples) using descriptive and inferential statistics.

**Results**

Majority of the subjects (63.2% in the control and 61.5% in the experimental groups) were 14 years old. Out of 106 school children from the control group, 56.6% were males and 43.4% were females. Out of 104 school children from the experimental group, 54.8% were males and 45.2% were females. Majority of the school children in the control group and experimental
group were from nuclear families (74.5% and 80.8% respectively). Majority of the school children in the control and experimental groups (81.1% and 79.8% respectively) were non-vegetarians.

Majority of the school children in the control and experimental groups (67% and 76.9% respectively) were having no family history of hypertension. School children in the experimental and control groups were homogenous in terms of the background variables (p>0.05).

**Prevalence of pre hypertension and hypertension among school children in selected schools of Kerala**

<table>
<thead>
<tr>
<th>Hypertension status of school children</th>
<th>Number of children affected out of 1328</th>
<th>Prevalence out of 1000</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre systolic hypertension</td>
<td>352</td>
<td>265</td>
<td>26.5</td>
</tr>
<tr>
<td>Pre diastolic hypertension</td>
<td>300</td>
<td>226</td>
<td>22.6</td>
</tr>
<tr>
<td>Systolic hypertension</td>
<td>111</td>
<td>84</td>
<td>8.4</td>
</tr>
<tr>
<td>Diastolic hypertension</td>
<td>74</td>
<td>56</td>
<td>5.6</td>
</tr>
</tbody>
</table>

**Table 2 Frequency distribution and percentage of school children in the control and experimental groups based on their initial blood pressure status n=210**

<table>
<thead>
<tr>
<th>Blood Pressure Status of school children</th>
<th>Control group (n = 106)</th>
<th>Experimental group (n = 104)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Systolic Blood Pressure (SBP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>15</td>
<td>14.2</td>
</tr>
<tr>
<td>Pre-SHT</td>
<td>91</td>
<td>85.8</td>
</tr>
<tr>
<td>Diastolic Blood Pressure (DBP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>44</td>
<td>41.5</td>
</tr>
<tr>
<td>Pre-DHT</td>
<td>62</td>
<td>58.5</td>
</tr>
</tbody>
</table>

**Table 3 Mean, SD and t values of blood pressure of school children in the control and experimental groups in the pre test n=210**

<table>
<thead>
<tr>
<th>Blood pressure of school children</th>
<th>Control group (n = 106)</th>
<th>Experimental group (n = 104)</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>118.85</td>
<td>5.37</td>
<td>119.25</td>
<td>4.90</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>76.19</td>
<td>5.61</td>
<td>77.50</td>
<td>4.48</td>
</tr>
</tbody>
</table>

**ns** Not Significant at 0.05 level
Table 4 Mean, SD and t values of systolic blood pressure of school children in the control and experimental group at 4th, 8th and 12th months

<table>
<thead>
<tr>
<th>Systolic Blood Pressure</th>
<th>Control group (n = 106)</th>
<th>Experimental group (n = 104)</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>4th month</td>
<td>118.66</td>
<td>5.14</td>
<td>118.60</td>
<td>4.89</td>
</tr>
<tr>
<td>8th month</td>
<td>118.75</td>
<td>4.47</td>
<td>118.23</td>
<td>5.14</td>
</tr>
<tr>
<td>12th month</td>
<td>119.32</td>
<td>3.92</td>
<td>117.23</td>
<td>5.36</td>
</tr>
</tbody>
</table>

** Not Significant at 0.05 level

* significant at 0.05 level

ANCOVA was done to confirm that the baseline blood pressure status has not affected the post test means of the blood pressure values of the control and experimental group. After adjusting the post test means of systolic blood pressure (SBP) values, the experimental group had lower mean systolic blood pressure values than the control group. The difference was significant in the mean post test SBP values at 8th and 12th months (F=4.89; p=0.028 and F=29.08; p=<0.001 respectively). Hence it can be concluded that the MCIP was effective in reducing the systolic blood pressure of the experimental group.

Table 5 Mean, SD and t values of diastolic blood pressure of school children in the control and experimental group at 4th, 8th and 12th months

<table>
<thead>
<tr>
<th>Diastolic Blood Pressure</th>
<th>Control group (n = 106)</th>
<th>Experimental group (n = 104)</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>4th month</td>
<td>75.62</td>
<td>5.87</td>
<td>76.92</td>
<td>4.76</td>
</tr>
<tr>
<td>8th month</td>
<td>76.12</td>
<td>5.83</td>
<td>75.96</td>
<td>5.05</td>
</tr>
<tr>
<td>12th month</td>
<td>76.21</td>
<td>5.09</td>
<td>77.12</td>
<td>4.48</td>
</tr>
</tbody>
</table>

** Not Significant at 0.05 level

ANCOVA was done to confirm that the baseline blood pressure status has not affected the post test means of the blood pressure values of the control and experimental groups. After adjusting the post test means of diastolic blood pressure (DBP) values, the experimental group had lower mean diastolic blood pressure values than the control group. But the difference was statistically significant only in the mean post test DBP values at 8th month (F=12.67; p=<0.001) even though the mean diastolic blood pressure value was lower at 12 months in the experimental group.

There was a significant association of systolic blood pressure of school children with their class of study. No significant associations were found between other variables under study.

Also there were no associations found between diastolic blood pressure and any of the socio demographic variables under study.

Discussion

The findings of the screening showed a similar status of blood pressure in school children as showed by many previous research studies. The studies conducted
by Avinash Sharma et.al, Akis N et.al, Nogueira PC et.al, Anand T et.al, Manuraj et.al, Buch N et.al and Nkeh-Chungag BN et.al supports the findings of the present study. The multi component programme which is an educational intervention programme was the crux of the study. The programme was aimed at improvement of the knowledge and attitude of the children thereby developing a healthy lifestyle practice. Several such attempts are made by many researchers elsewhere but hardly very few efforts were done in the local settings of Kerala with regard to childhood hypertension. The present study findings are in congruence with the results of studies conducted by Grad I, Jan S et.al, Taha AZ, Meagher D, Mann KV, Yan Ping Wan, P.D Angelopoulose et.al, McMurray et.al, Subramanian H et.al, and Cai L et.al.

The findings of the present study show that hypertension among school children is a health concern not only of the developed countries but of developing countries like India. Life style modifications will definitely have an impact in reducing such health problems.

**Conclusion**

The study was an attempt towards reducing the chances of hypertension by modifying the life style of school children. The multi component intervention programme was effective in reducing the systolic blood pressure of school children. Though it was a humble beginning on a relatively small group, this gives a ray of hope that a definite change can be made with collective effort on a large scale. The present study could achieve its objectives. This was a good attempt in addressing a very important and emerging health problem among children. The results of the study were in congruence with the findings of the results of the previous researches.

**Conflict of Interest :** - Nil

**Sources of Funding:** - Self

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Charting the Polymorphism of Angiotensin Converting Enzyme Gene in Obstructive Sleep Apnea Patients: A Case Control Study in Indian Population

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Abstract

Introduction: Obstructive sleep apnea (OSA) is defined by the number of apnea and hypopnea episodes per hour of sleep (apnea–hypopnea index, AHI), reflecting the degree of departure from the normal physiology of breathing during sleep. It can be influenced by both genetic and environmental factors. From the literature it is evident that the polymorphism of ACE gene is linked to various disorders. The study aims to chart the polymorphism of the ACE gene in the OSA patients.

Material and Method: A total number of 100 subjects (50 OSA and 50 control) were involved in the study. ACE gene I/D allele and genotypes distribution were analyzed in both the OSA and the control group. The data collected was subjected to statistical analysis.

Results: The study showed that there was a higher frequency of I allele in the patients with OSA. Patients with sleep apnea had a higher frequency of II genotype, compared to control group.

Conclusion: It is evident from the study that the higher frequency of I allele is associated with the presence of Obstructive sleep apnea. Hence, ACE gene polymorphism might be useful to ascertain the risk of developing OSA.

Keywords: Alleles, Angiotensin converting Enzyme, Genetic Polymorphism, Genotype, Renin-Angiotensin System, Obstructive Sleep Apnea,

Introduction

The obstructive sleep apnea (OSA) is characterized by episodes of partial or total upper airway obstruction during sleep with airflow interruption. This is caused by any obstruction in the upper-airway at the pharyngeal level despite normal functioning of the respiratory muscles. This phenomenon is accompanied by decrease in oxygen saturation and increased carbon dioxide saturation in the blood. The patient experiences transient awakening, which helps in reestablishing the upper airway permeability. Consequently, the patient usually complains of fatigue and excessive daytime drowsiness, attention or memory impairment, and habitual snoring history¹.

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According to The American Academy of Sleep Medicine, OSA can be diagnosed by the number of apnea/hypopnea events during sleep, which is known as the apnea-hypopnea index (AHI). The AHI index measures the number of events occurring per hour of sleep. The repetitive occurrence of these events contributes to disturbed sleep which results in excessive daytime sleepiness. The American Academy of Sleep Medicine considers OSA severity by the AHI classification (mild—5 to 15; moderate—15 to 30, and severe—>30) and by the degree of daytime drowsiness (mild: unwanted drowsiness or involuntary episodes occurring during activities. The gold standard for diagnosing Obstructive Sleep Apnea is Polysomnography².

The major risk factor for OSA is obesity around the cervical and abdominal region followed by structural abnormalities of upper airways, which decrease airway patency due to fat deposition around the collapsible region of the pharynx resulting in narrowing of the area. Most affected patients are men compared to women which may be because of the longer pharyngeal portion of upper airway and larger fat deposits around it³.

The etiology of OSA is not yet fully understood. It may be due to a combination of structural, genetic predisposition and hormonal factors. Genes which influence the risk of OSA, demonstrate polymorphisms which have been observed to occur in diseases of similar pathogenesis to OSA. Apolipoprotein E gene (APOE), leptin and leptin receptor genes, pro-inflammatory cytokine genes including TNFA1, IL-6, IL-1, as well as β2-adrenergic receptor gene (ADRB2) and angiotensin converting enzyme gene (ACE) are some of the genes involved in the risk of OSA⁴.

Numerous polymorphisms have been identified recently about the genetic polymorphisms of the angiotensin converting enzyme gene and its correlations with various disorders.⁵ In 1990, Rigat et al⁶ studied the polymorphism for the first time. The polymorphism consisted of insertion or deletion of 287 base pairs within one of the noncoding parts of the ACE gene. This alteration can result in three genotypes which affect activity of angiotensin converting enzyme (II, DD, ID). Allele D is believed to be associated with 60% higher activity of serum ACE. Homozygotes DD have maximal ACE activity while heterozygotes ID have intermediate activity. II genotype (lack of D allele) has the lowest serum ACE activity. Genotype DD of the ACE gene therefore leads to increased production of angiotensin II and increased inactivation of bradykinin. Significant correlation was observed between polymorphism of the ACE gene and cardiovascular morbidity and mortality. Subjects with DD genotype of the ACE gene had increased risk of myocardial infarction, hypertrophy of the left ventricle, post-infarct myocardial remodeling, and idiopathic arterial hypertension.

The aim of the study was to assess the incidence of insertion/deletion polymorphism of the ACE gene in patients with obstructive sleep apnea and healthy subjects, as well as to analyze the influence of this polymorphism on the risk of OSA occurrence in Indian population.

**Material and method**

The present study was approved by the Institutional Human Ethics committee, Institute of Medical science and SUM Hospital, Bhubaneswar, Odisha (DMR/IMS-SH/SOA/10657). A written informed consent was obtained from all the participants after giving the information sheet and explaining the procedure (Source of funding- Self).

The study group consisted of 100 participants (50 case and 50 control, aged 25–40 years). The cases were selected on the basis of type 4 sleep study data with an AHI of 15 or more to confirm the patients with moderate to severe OSA. The patients with history of cardiovascular disease, asthma and other medical histories were excluded from the study.

Patients were first evaluated using Epworth Sleepiness scale, developed in Epworth, Australia (Epworth Sleepiness Scale, ESS). The questionnaire consists of eight questions concerning the patient’s daily activity. Interpretation of the answers may disclose mild (< 10 points), moderate (10–16 points), or marked somnolence during the daytime (> 16 points), which requires further diagnostics.

Patients with scores more than 16 underwent the home sleep study to confirm OSA and after the confirmatory diagnosis these patients were included in the OSA group.

The control group were selected from the questionnaire-based study with the ESS score less than 10 and with no history of snoring and disturbed sleep.
Each participant from the study as well as control group filled in a written informed consent and a venous blood sample was collected for genetic testing. Blood samples were collected into tubes containing ethylene diamine tetra acetic acid (EDTA) and stored at –20°C. Isolation of DNA from peripheral blood was performed using HiMedia DNA kit (HiMedia, USA).

The DNA was amplified using the Forward Primer: 5’CTGGAGACCACTCCCATCCTTTCT3’ and reverse primer 5’GATGGTGGCCATCACATTCGTCAGAT3’ to study the polymorphism site of the ACE gene (insertion/deletion). Polymerase chain reaction (PCR) was performed in the Mastercycler pro vapo.protect™(Eppendrof) with the following sequence: initial denaturation at 96°C for 15 min, followed by 30 cycles of denaturation at 95°C for 30 s, hybridisation with starters at 61°C for 30 s, and elongation at 72°C for 2.5 minutes. After completion of all cycles, final elongation occurred at 72°C for 10 minutes.

The obtained PCR products were 190 base pairs (bp) for allele D or 480 bp for allele I. 2% agarose gel with ethidium bromide was used for Separation of DNA. After completion of electrophoresis, DNA bands were visualised using transiluminator under UV light.

For homozygous genotypes II and DD, a single band was present, representing 490 bp product or 190 bp product, respectively. Electrophoresis of PCR products from heterozygous ID subjects produced two bands simultaneously: one of 490 bp and one of 190 bp. Chi-square test was used to analyze the association of various alleles and genes in OSA and control group.

Results

In the group with OSA, II genotype was found in 20 persons (40%), ID genotype in 22 (44%), and DD genotype in 8 (16%). Incidences of respective genotypes in the control group were as follows: II genotype in 16 patients (32%), ID genotype in 18 (36%), and DD genotype in 16 (32%). No significant differences were observed in the incidence of respective ACE genotypes between the study and the control group. However, II genotype was observed more often in patients with sleep apnea than in the healthy patients (p = 0.116).

Furthermore, I allele (both II homozygotes and ID heterozygotes) was more frequently identified in OSA subjects (42 persons, 62%) than in healthy patients (34 patients, 50%; $\chi^2 = .890$).

Discussion

Obstructive sleep apnea is multifactorial in nature, involving genetic factors, obstruction in the upper airway, obesity etc. Currently the association of OSA with various genes is being studied to determine the potentially susceptible gene. The angiotensin-converting enzyme (ACE) contains 26 exons and 25 introns and is located on chromosome 17q23. ACE is essential in converting angiotensin I into angiotensin II, which is mainly an effector molecule in the renin–angiotensin–aldosterone system (RAAS), and RAAS activation may have a role in the development of obstructive sleep apnea (OSA). Most studies published till date highlight the relationships between ACE activity and ACE polymorphism, risk of OSA complications, including arterial hypertension, as well as the occurrence of other diseases coexisting with OSA.

In this study genetic testing is performed in order to assess the incidence of insertion/deletion polymorphism of the ACE gene in patients with OSA and in healthy control subjects presenting no respiratory disturbances during sleep.

Distribution of II, ID, and DD genotypes did not differ significantly between the two groups, although the II genotype was slightly more frequently present in subjects with OSA. These results are in line with data published by other researchers.

In the present study it was found that in the patients with OSA there is an increased incidence of I allele and significantly lower incidence of D allele of the ACE gene. In the healthy patients there was equal distribution of I and D allele. So it may be concluded from the present study that the presence of I allele positively correlated with the risk of OSA development. The results of this study was similar to the study done by A Barcelo et al.

Renata Rubinsztajn and Ryszarda Chazan analyzed ACE polymorphism in 62 persons with OSA and identified the II genotype in 23.8% of patients, ID genotype in 47.6%, and DD genotype in 28.6%.

In a study done by Ogus et al in a Turkish population, no significant differences was observed in the incidence of the respective ACE genotypes between patients with OSA and healthy persons; however, the
I allele was identified more frequently in patients with sleep apnea than in control subjects \( (p = 0.02) \), and the risk of developing apnea in group of I allele carriers was 2.41. These authors suggest that II and ID genotypes of the ACE gene may correlate with a higher risk of developing apnoea in the Turkish population was similar to our study.

The increase in I allele lowers the ACE level, increasing the risk of OSA development. The lower ACE level reduces the vasoconstriction which may increase the collapse and obstruction of the upper respiratory tract leading to the development of OSA\(^{10,11}\).

Correlation between ACE gene polymorphisms and the risk of developing cardiovascular diseases in patients with OSA have been extensively studied. Koyama et al.\(^ {12}\) found that I allele occurs commonly in men with arterial hypertension and mild-to-moderate sleep apnea. These results led to the hypothesis that the presence of I allele of ACE gene in men suffering from arterial hypertension has a protective effect against severe OSA. This study had included 266 Brazilian patients with OSA.

Lee et al.\(^ {13}\) conducted a study on subjects of Asian ethnicity. The study considered 1,227 patients with OSA and 1,227 healthy subjects. No correlation was found between ACE gene polymorphism and risk of OSA development or disease severity. The presence of either I or D allele did not have any correlation with the risk of development of OSA. This study is not in accordance to the current study.

Zhang et al.\(^ {14}\) in their study showed that I allele of the ACE gene occurs more frequently in subjects with coexisting arterial hypertension and moderate-to-severe OSA as compared to healthy persons. No such correlation was observed for I allele in patients with arterial hypertension and mild OSA versus control persons. Central obesity in patients with OSA and hypertension correlate with the presence of the D allele in the ACE locus. However, polymorphisms of the ACE gene were not investigated in patients with OSA who did not have arterial hypertension. Furthermore, the study was based on 174 patients of Asian origin, coming from the Han population, thereby hindering direct result comparison with studies concerning Caucasian subjects, even though the results seem to be similar.

Wisconsin Sleep Cohort Study done on 1,100 mostly Caucasian participants, highlighted the correlation between ACE gene polymorphisms and risk of arterial hypertension in patients with OSA. Lin et al.\(^ {15}\) showed that the risk of developing arterial hypertension in patients with mild-to-moderate OSA is correlated with presence of the D allele. These authors found significant increased arterial pressure in subjects with DD genotype, and lowest effect for the type II genotype. This correlation was found to be significant for patients with mild OSA.

Similar results were shown by Bostrom et al.\(^ {16,17}\), who compared 157 patients suffering from OSA and arterial hypertension with 181 persons suffering from OSA but with no history of hypertension. Irrespective of the OSA severity, the presence of the D allele indicated an increased risk of developing arterial hypertension in patients with sleep apnea. These results were contradictory to those published by Patela et al.\(^ {18}\), who observed 972 subjects during the Cleveland Family Study. The described a lower risk of arterial hypertension in carriers of the D allele in the ACE gene locus.

**Conclusion**

From the present study it is evident that the patients with OSA and the healthy patients had similar genotype distribution for ACE. The patients with OSA had increased presence of I allele whereas healthy patients had similar distribution of both I and D allele. The II genotype presented a higher frequency in the patients with Obstructive sleep apnea. Based on the present study it may be concluded that the presence of I allele might have an increased risk of developing OSA.

**Conflict of Interest:** None

**Source of Funding:** Self-Funded

**Ethical Clearance:** The ethical clearance (DMR/IMS-SH/SoA/10657) was obtained from Institutional Human Ethics committee, Institute of Medical science and SUM Hospital, Bhubaneswar, Odisha.

**References**


Role of Physiotherapy Post Renal Transplantation - A Case Report

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Abstract

Introduction: Physiotherapy is widely used in the renal transplant intensive care unit to minimize post-operative respiratory and musculoskeletal complications. Patients undergoing kidney allotransplants need help in recovery. Improvement of health status after the intervention depends in large measure on cooperation of the therapeutic team. For many physiotherapists, rehabilitation after transplantation becomes a problem with such patients, and there is very sparely available data in the literature about methods for encouraging patients to exercise. Hence this study was taken. Objective: To assess the changes in, pulmonary, physiological and renal outcome in patient with renal transplant. Methodology: A case of chronic kidney disease was reported to SRM General Hospital, Chennai and planned for renal transplant, post operatively patient complaints of pain over lower abdomen and right side while moving around the bed and during sitting. Patient underwent physiotherapy for 2weeks in SRM General Hospital and followed up for three months. Physiotherapy Intervention program including chest physiotherapy, early mobilization and therapeutic exercises was given following which physiological parameters, hemoglobin and renal profile. Results: The improvement in physiological parameters and hemoglobin. There has been a modest improvement in vo2 max. Conclusion: An individualized post renal transplant physiotherapy intervention improved pulmonary and physiological outcomes than renal outcomes in renal transplant.

Keywords: post renal transplantation, physiotherapy, exercise, Vo2max, MET.

Introduction

In last two decades, renal, heart, liver and lung transplantations have become common, successful and progressively improved, among which renal transplantation is the most frequent.[1] Although the number of successful transplantations increases, new challenges have arisen in the management of long-term complications of transplantation.[2] Even successfully transplanted renal transplant recipients (RTRs) suffer from hypertension (HTN), coronary artery diseases, skin cancers, diabetes, bone diseases, and various infections. Survival is compromised by an increased cardiovascular risk.[3-6] The cardiovascular events are represented as one of the major causes of death among RTRs.[1,3,5,7] Incidence and prevalence rate of cardiovascular disease (CVD) are four to six times higher in RTRs compared to the general population.[8] Among RTRs, HTN, obesity, anemia, muscle wasting, and use of immunosuppressive drugs commonly coexist as long-term complications.[3,8-10]

Pharmacological treatments alone cannot efficiently reduce all cardiovascular risks. It also does not efficiently improve work capacity and quality of life including biological and psychological problems. Furthermore, immunosuppressive drugs have their own side effects such as excessive weight gain, HTN, dyslipidemia, and muscle wasting.[3-5] Moreover, after a successful renal transplantation, 83% of RTRs have a tendency that does not go back to work due to depression such as complex phenomenon and this type of sedentary lifestyle is also
one of the risk factors for CVD\textsuperscript{[4,9,11]} Incorporating “non-pharmacological” therapies such as physical training which are able to reverse this trend is very important\textsuperscript{[3]}

**Methodology**

This is a single case report to analyze role of Physical therapy intervention on physiological outcome in a patient with renal transplantation the study was conducted at SRM medical college hospital and research institute Chennai, the subject was taken from a surgical intensive care unit.

**Case Report**

A 44-year-old male, presented at our institute with complaints of abdominal pain, shortness of breath while walking 15–20 steps on a level surface and reduced work capacity. He was investigated and diagnosed to have End stage renal disease with haemodialysis and underwent living donor (wife) renal transplantation on 24\textsuperscript{th} October 2017. He was a nonsmoker and a known case of HTN for 10 years. He was diagnosed with chronic kidney disease. In the subsequent years, he complained of having mild dyspnea during routine work, weakness, fatigue, and weight gain of 4–5 kg within 2 months. However, he ignored the complaints.

However, after 2 months, dyspnea at rest was present with pitting pedal edema extending up to the knees (bilateral). On consulting the nephrologist, he was diagnosed with chronic kidney disease (CKD) stage 4 with abnormal laboratory findings (serum creatinine-5 mg/dl, estimated glomerular filtration rate [GFR]-23 mL/min/1.73 m2). Gradually, the subject progressed to end stage kidney disease (serum creatinine: 19 mg/dl, estimated GFR <15 ml/min/1.73 m2). A planned live allograft renal transplantation (willingly given kidney by his wife) was performed after HLA typing and negative Centers for Disease Control and Prevention cross match. The subject was monitored in the intensive care unit for 15 days before he was transferred to the ward. He was discharged after 6 days in ward advised for routine laboratory investigations which include complete blood count, serum creatinine, serum glucose, and BUN at every week for 2 month.

**Physiotherapy Intervention**

**Procedure:**

The ICU patients who referred for physiotherapy were included for the study after obtaining informed consent from the patient / patient care taker.

In the institutional setup from day 1 of post operation to 15 days of post operation, patient underwent various aerobic and anaerobic exercises include Day 1–5\textsuperscript{th} Deep breathing exercises, Chest expansion exercises, Chest physiotherapy(percussion), Ankle and Toe movements, Alternate leg slides, Incentive spirometry (600cc/sec). Patient made to sit with support. On 5\textsuperscript{th} day patient made to walk with in the ICU (4 rounds) (RPE 10), These exercises are followed for Frequency: 6 days/week, Intensity: 10 RPE, Time: 30 min/session. From Day 6\textsuperscript{th}– 10\textsuperscript{th} the exercises were progressed based on the patients exercise capacity AROM and Strengthening exercises to bilateral upper and lower limbs, Deep breathing exercises, Chest expansion exercises, Chest physiotherapy (percussion), Incentive spirometry (1200cc/sec), patient Made to walk around the ICU (6 rounds) (RPE 13). Day 11\textsuperscript{th}–15\textsuperscript{th} AROM and Strengthening exercises to bilateral upper and lower limbs, Deep breathing exercises, Chest expansion exercises, Incentive spirometry (1200cc/sec) with 10 sec hold, patient made to walk around the ICU for (7 rounds) (RPE 13) Routine Chest physiotherapy continued, active exercise to bilateral upper and lower limbs, pelvic bridging exercise, Along with patient made high sitting, sit to stand, walking was given.

In the community based session patient performed a series of aerobic exercises and resisted exercises based on his exercise capacities by self monitoring the Target heart rate (THR) initially up to 50% and progressing to 55 to 60%. From Day 16\textsuperscript{th} – 60\textsuperscript{th} Chest care continued, limb care such as stretching, Active range of motion to right upper and lower limb, Strengthening Active range of motion exercise bilateral upper and lower limb. Day 61\textsuperscript{st} – 90\textsuperscript{th} limb care such as stretching, Active range of motion to right upper and lower limb, Strengthening Active range of motion exercise bilateral upper and lower limb, cycling activities done, ambulation done 15 – 30 minutes RPE 13. Day 91\textsuperscript{st} – 120\textsuperscript{th} strengthening exercises, Active range of motion to right upper and lower limb, Strengthening Active range of motion exercise bilateral upper and lower limb. Cycling activities, ambulation for more than 30 min.

**Reassessment**

Before the discharge from on the hospital on December 23\textsuperscript{rd} patient was made to perform six minute
walk test which shows a pre test values of Respiratory rate -24 breaths /min, Heart rate -85beats /min, Resting blood pressure – 130/80 mm of hg and the post test values were Respiratory rate -28 breaths /min, Heart rate -92beats /min, Resting blood pressure – 140/90mm of hg ,Number of laps covered – 6, Distance covered – 360meters, MET -2.5, $VO_2$ max-8.1ml/kg/min.

Patient was made to repeat six minute walk test after 6 weeks of community training on February 15th pre test values was Respiratory rate -24 breaths /min, Heart rate -85beats /min, Resting blood pressure – 120/80mm of hg and the post test values were Respiratory rate -26 breaths /min, Heart rate -90beats /min, Resting blood pressure – 130/90mm of hg, Number of laps covered – 8, Distance covered – 420meters. MET – 3.5, $VO_2$ max- 10ml/kg/min.

Data Analysis

The changes in the parameters were noted for everyday and the physiological outcomes in a post renal transplantation patient receiving chest and limb physiotherapy were analyzed after the data was taken from day of physiotherapy received to till discharge.

Results

The purpose of this case study was to present the effects of Role of physical therapy intervention on patient with renal transplantation patient tolerated the prescribed interventions very well. Regular physical exercise improves exercise capacity and quality of life (GaniyuSokunbi et al).The positive results of exercise Capacity, our results support the efficacy and need for Physiotherapy intervention for this patient. However the hemoglobin level showed improvement in following physical therapy.

Table 1: Day wise changes in Blood, Creatinine, Hemoglobin.

<table>
<thead>
<tr>
<th>Day</th>
<th>BUN</th>
<th>Creatinine</th>
<th>Hemoglobin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>34</td>
<td>1.2</td>
<td>11.5</td>
</tr>
<tr>
<td>6-10</td>
<td>36</td>
<td>1.2</td>
<td>12.0</td>
</tr>
<tr>
<td>11-15</td>
<td>38</td>
<td>1.2</td>
<td>12.8</td>
</tr>
<tr>
<td>16-60</td>
<td>43</td>
<td>1.2</td>
<td>12.8</td>
</tr>
<tr>
<td>61-90</td>
<td>48</td>
<td>1.4</td>
<td>13.6</td>
</tr>
<tr>
<td>90-120</td>
<td>51</td>
<td>1.4</td>
<td>15.7</td>
</tr>
</tbody>
</table>

Discussion

The study was a single-subject design, which was worthy for evaluating physiological outcome and response of an individual subject with renal transplantation. Resisted training was proved beneficial when combined with aerobic exercises on CKD and end-stage renal disease. We investigated the efficacy of aerobic exercise with resisted training in preventing post renal transplant complications. The results of the single-case study indicate that appropriate, regular, and supervised aerobic exercises with resisted training protocol can reduce post renal transplant complications and improving work capacity. The changes in renal parameters were insignificant which indicates the potential benefits of physiotherapy in improving the physiological outcomes in renal transplant are independent of improvement in renal parameters [10, 12] Post transplant complications and mortality among RTR’s are highly influenced by physical
inactivity. Researchers have suggested the need for intervention studies to investigate the long-term effects of physical activity\cite{6,8,11}. In our study, the Institutional phase consisted of aerobic exercise, which showed improvement in symptoms within 15 days; however, the effect was not sustained after 15 days of cessation of the intervention. Hence, in the community phase, progressive resisted exercises were included along with aerobic exercises for 4 months under telecommunication and self monitoring the Target Heart Rate (THR) initialing from 50% and progressing to 55-60%.

In addition, the concept of the breathing exercise has changed over the years and only recently includes active upper and lower limb exercises, supervised walking, and the use of steps. These latter changes in body position, as well as breathing exercises, In the present study, the patient performed upper and lower limb exercises combined with breathing exercises and used training loads of 1kg to 3kg. However, there is no consensus regarding the weight of the training load, the number of series, and the frequency of the exercise protocol, each of which could have been insufficient and could have influenced our results.

VO2 max during the institutional phase was stable and community phase showed improvement in aerobic phase along with resisted phase. During this period, any sign of graft rejection was not seen\cite{3-5} Results of other outcome measures Hb level indicate improvement, which was in accordance with the result of other studies\cite{10,15,17,25} Combined aerobic exercises and resisted training show better improvement not only over the symptoms but also over the factors, which are responsible for causing after transplant complications. The objective of our study was fulfilled by the interventions, which is worthwhile and is feasible to follow in clinical practice. However, there is a requirement to apply the interventions over a large group of RTR’s as the results of our study were acquired from a single-case design.

The limitations of this study was first single case study, second long term follow up was not considered, third in community phase patient was not under therapist supervision (telecommunication was done).

Further study can be aimed at large sample population, long term follow up, community rehabilitation phase under therapist supervision, investigating the effect of exercise on late complications of renal transplantation.

**Conclusion**

This case report shows that aerobic exercises with resisted training intervention are capable of not only improving and maintaining the overall health of RTR’s and prevent post transplantation complications. Physical therapy intervention also has definite role in improving quality of walking and exercise performance in patient with post renal transplantation. On other hand physiotherapy plays no role in improving renal parameters. However this needs to be verified in larger sample before generalization of these finding.

**Source of Funding** - Self

**Conflict of Interest** – Nil

**Ethical Clearance** – Not applicable for –A case Report

**References**


2. GaniyuSokunbi 2017, Exercise and Rehabilitation Needs for Kidney Transplantation


Perceptions for Community Medicine Subject amongst Undergraduate Medical Students of Deemed University Kolhapur, Maharashtra

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Abstract

Background: Community Medicine is included in medical education to make the medical students aware and responsible for community. The broad aim of teaching community medicine for undergraduate is to prepare them to function as community and first level physician in accordance with institutional goals.

Method: Cross sectional study conducted from April to August 2015. 240 medical students of 3rd to 7th term MBBS of D.Y.Patil Medical College, Kolhapur participated. All were explained purpose of study and assured confidentiality. Data collected from willing participants using pre-tested questionnaire contains primary data and interest, perceptions of teaching methods, curriculum, preference, career, etc in community medicine.

Results: 70.42% students interested in CM subject. Less field visits (45.07%), more calculations & formulae (32.39%) were prime reasons of non-interest. Majority (67.50%) purchased text book in 3rd year & K. Park remains most preferred (75.83%). Learning CM leads to positive change in life style. Majority knows importance of subject in PG entrance but few consider it in top five. 53 students interested for career in CM while 60.83% not interested. 87.08% felt CM important in clinical practice and 82.08% claimed it helps to get them closer to community. 84.17% told field / community visits needed for better understanding and 87.08% felt need of social awareness activities. 84.17% told field visits needed for better understanding and 87.08% felt need of social awareness activities. 89.17% agreed getting knowledge of Government programmes/ policies from subject.

Conclusions: Minimal interaction of students with community and public health services with more of lecture based teaching in Community Medicine may be the key issues. It should be more interactive, student centric, problem solving and evidence based, focusing to the community needs.

Keywords: community medicine, medical students, perception, interest, importance.

Introduction

Community Medicine is entirely related to the community and diseases related to it. The scope of medicine has expanded during last few decades to include health problems of individuals and community. Systems should integrate health promotions and disease prevention on one hand and treatment for acute illnesses and chronic care on the other. (¹) One of a good definition of Community Medicine by the WHO is “the study of health and disease in the population of defined communities or groups in order to identify their health needs, and to plan, implement and evaluate health programs to effectively meet these needs.” MCI says about MBBS curriculum that, “Undergraduate medical curriculum (shall be) oriented towards training students to undertake the responsibility of a physician of first contact, capable of looking after preventive, promotive, curative & rehabilitative aspects of medicine.” (²)

To a student of medicine, Community Medicine often appears as an aberration. Little does he realise that community medicine offers him the only link with real life experience and enables him to visualise a system
of affordable health care which is most relevant to the needs of our country.\(^3\)

Doctors who have decided to set up private practice can benefit from the discipline of community medicine. Knowledge of community dynamics, community skills and cultural factors related to health improves the doctor-patient interaction and directly leads to increased patient confidence and improved compliance.\(^3\)

Currently teaching in Community Medicine is lecture based in the Ivory towers of medical colleges with little interaction with community and public health services, while ideally it should be student centered, evidence based and problem solving type of active learning and capable of addressing to the community needs.\(^2\) The crux of the matter is why should medical student study community medicine? There are number of reasons why student needs to master this discipline.\(^3\) Subject of Community medicine is considered a game changer in improving the community health. It is lauded universally but receives only a lip service–be the political leaders, health planners or administrators. Most medical students also neither perceive it important nor find it interesting and find it one of the least liked subjects during entire MBBS. Students read it just to clear the university exam or acquire factual knowledge needed to clear postgraduate (PG) entrance exams.\(^2\)

Despite the National Health Policy 2002’s recommendation of reserving 25% of all post-graduation seats for CM, no such commitment of increasing seats for CM was observed in any of colleges/Institutions in India.\(^4\) In fact prior to this it’s important to know the students’ perception about community medicine subject and career preferences as it may determine the success of universal health coverage in India.

All this necessitates planning the study in undergraduate medical students to know their perception for community medicine subject and career preferences from their point of view.

**Method**

The Cross-Sectional study was conducted at Medical College of D.Y.Patil Deemed University, Kolhapur, Maharashtra. The study populations were medical students from second and third MBBS. 240 students had participated in present study. Only 3\(^{rd}\) to 7\(^{th}\) term MBBS students of second and third (Part I) MBBS, those willing were included in study. First and Third (Part II) MBBS students and unwilling to participate were excluded from study. Study subjects were selected randomly and explained the purpose of study and assured confidentiality. The data has been collected from April to August 2015. The semi-structured, self-administered, pre-tested questionnaire used to collect data. It contains almost 25 questions about primary information, their interest in the subject, their perceptions about curriculum, teaching methods and faculty, importance given to subject, orientation, and preferences for career. The collected data was tabulated and analysed for descriptive statistics.

**Results**

Total 240 medical students from 3\(^{rd}\) to 7\(^{th}\) term MBBS of D.Y.Patil Medical College, Kolhapur included. There were 135 (56.25%) boys, 105 (43.75%) girls. 70.42% students were interested in community medicine subject. Most common reason for interest was getting knowledge for clinical practice (56.21%), easy & scoring subject (24.26%), and also good teachers (17.16%). About 29.58% students were not interested in the subject. Prime reason for non-interest was less field visits (45.07%), calculations & formulae (32.39%).

Almost 50.83% students agreed, Community Medicine should be taught from first year. While 18.33%, 6.67% & 22.92% opined, subject should be taught from 3\(^{rd}\), 4\(^{th}\) & 6\(^{th}\) term respectively. Preferred teaching methods were blackboard (39.17%), practical (34.17%), power point presentation (25%). Majority (67.50%) purchased text books in 3\(^{rd}\) year while 20.42% in 2\(^{nd}\) year, only 7.92% in 1\(^{st}\) year. Most preferred (75.83%) textbook of CM was K. Park. Few (9.58%) preferred other than Park, 7.08% referring class notes also.

Studying CM subject was weekly 35.42%, monthly 19.17%, few daily 11.67%. About 33.75% were studying just before examinations. Class attendance found regular in 70.83%, occasional 20%, monthly 5%, while 4.17% use to attend field visits only. Learning CM revealed positive change in life style among 79.17%, no change in 20.83%. Change in hygiene 37.37%, diet 36.84%, exercise 17.89% and smoking 7.89%. Senior’s advices to study regularly 52.92%, study just before exam & you’ll easily pass 27.08%, useless subject & waste of time 18.33%. Majority (85%) known importance of subject in PG entrance, while 13.33% not known. CM
has significant weightage in PG entrance examination. Majority (135) told subject carries 20%, 86 told 10% and 19 told 5% weightage. 60.83% not interested for career in CM but 53 interested for career in CM as medical officer 23, teaching 8, NGOs 9, administration 9, research 3 & Surveillance MO 1. About 17.92% consider CM in top five subjects, remaining 82.08% don’t.

According 49.17% students CM is too basic and vast subject, 65.83% it’s not subject to score. Efforts by teachers were enough in 67.08% while 87.08% felt subject an important in clinical practice. Field / community visits needed for better understanding of subject in 84.17%, social awareness activities needed 87.08%. Many (89.17%) getting knowledge of government health policies from subject. Subject helps to remove social stigma as per 87.08%, also helps to promote duty and ethical practice in 77.92% while 82.08% claimed CM helps getting closer to community. (Table no. 2)

84.02% students sometimes attended & 68.04% sometimes participated in seminars, posters, debates, etc activities in CM as part of Health Day celebrations, Village adaption scheme, etc. 15.98% never attended and 31.96% never participated in such type of activities throughout curriculum.

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Responses</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CM too basic and vast</td>
<td>118</td>
<td>49.17</td>
<td>122</td>
<td>50.83</td>
</tr>
<tr>
<td>2</td>
<td>Just a subject to score marks</td>
<td>82</td>
<td>34.17</td>
<td>158</td>
<td>65.83</td>
</tr>
<tr>
<td>3</td>
<td>Efforts of teachers enough</td>
<td>161</td>
<td>67.08</td>
<td>79</td>
<td>32.92</td>
</tr>
<tr>
<td>4</td>
<td>Important in clinical practice</td>
<td>209</td>
<td>87.08</td>
<td>31</td>
<td>12.92</td>
</tr>
<tr>
<td>5</td>
<td>Field visit needed</td>
<td>202</td>
<td>84.17</td>
<td>38</td>
<td>15.83</td>
</tr>
<tr>
<td>6</td>
<td>Social awareness activities needed</td>
<td>209</td>
<td>87.08</td>
<td>31</td>
<td>12.92</td>
</tr>
<tr>
<td>7</td>
<td>Knowledge of government health policies</td>
<td>214</td>
<td>89.17</td>
<td>26</td>
<td>10.83</td>
</tr>
<tr>
<td>8</td>
<td>Removes social stigma</td>
<td>209</td>
<td>87.08</td>
<td>31</td>
<td>12.92</td>
</tr>
<tr>
<td>9</td>
<td>Promotes duty, ethical practice</td>
<td>187</td>
<td>77.92</td>
<td>53</td>
<td>22.08</td>
</tr>
<tr>
<td>10</td>
<td>Helps get closer to community</td>
<td>197</td>
<td>82.08</td>
<td>43</td>
<td>17.92</td>
</tr>
</tbody>
</table>
Discussion

Main objective of Community Medicine teaching is to expose medical students to Primary and Secondary healthcare settings where they will render competent promotive, preventive, curative and rehabilitative services. This helps them to serve the needy people in community as primary healthcare physicians, with holistic approach, in alignment with the National Health Goals and vision of the Ministry of Health. (5)

We found 70.42% students interested in Community Medicine subject as getting knowledge for clinical practice (56.21%), easy & scoring (24.26%). While 29.58% were not interested in CM due to less field / community visits (45.07%), calculations (32.39%). P.K. Mandal et al (6) majority (51%) thought that subject necessary to study medicine in real community situation. 59% not satisfied with the syllabus. Common topic wanted to exclude was environmental sanitation (19%) and maximum new inputs were in favour of private and public health care delivery (15.89%). Tutorial (44.3%) and family study (41.9%) learning were favoured teaching methods. Students preferred problem related (55.7%), MCQs (53.3%) for theoretical exam. For practical examination community was preferred venue (64.3%).

Similarly our study preferences to teaching methods were blackboard (39.17%), practical (34.17%), power point presentation (25%). Field / community visits needed for better understanding of subject according to 84.17% which quoted by many studies. 89.17% expressed are getting knowledge of Government health programmes, policies from CM which attains important objective of subject. CM subject help to promote ethical practice by 77.92% students need to be more efficiently incorporated in curriculum to improve health provider’s image and quality health care in India. 82.08% claimed CM helps to get them closer to community which provides opportunities to understand community and their needs is the essence to produce family physicians.

Many (60.83%) were not interested for career, but 39.17% interested for career in Community Medicine as MO, teaching, NGOs, administration, research & analysis & Surveillance MO. Only 7.92% of students consider CM in top five subjects. Sitanshu Shekhar Kar et al (7) showed, there is limited preference for PSM as career of choice. Curriculum modification and explanation of career path after post graduation in community will help to generate interest in subject. Sigh G et al (8) only 6% students marked community medicine as career option, and only one female student wants it as only career option. With a dream to become famous and earning doctor, they just do not want it. Almost all have not even heard of it before MBBS. Almost 40% said clearly do not like Community Medicine and not interested, 20% were clueless about subject, good number cited it boring, other reasons were clinical orientation, feel branch has no scope with low salary and low satisfaction, rural work, no role models. As community medicine is linked to community so more of community visits and rural postings suggested 45% students.

There is need to increase manpower in areas such as Community Medicine, psychiatry and ophthalmology among others in India. (9,10,11) Understanding factors that influence students’ decisions regarding future career may help in taking corrective measures. Study done at private medical college in southern India has shown almost all students (99.2%) wish to pursue postgraduate studies, higher than 83.5% in the study done at government medical college, Delhi. (12)

Roy B et al (13) students give more preference for PG course in clinical subjects than para clinical subjects. Author observed only 22.5% preferred career in community medicine. But contrary to that, 85% consider this subject to be important to crack the PG entrance exam. In Harsha Kumar HN et al (14), there were no significant gender differences on preferences for research career. It was seen that among females medicine and OBG were most preferred PG courses and among males surgery was most preferred PG courses but community medicine was among less popular subject. Sadawarte MK et al (15) about 65% students expressed CM has limited scope as career and they believed that CM professionals become Public Health Administrators only. Around 70% claimed CM is an ideal choice for PG as there is not much financial gain in CM. About 22% males commented Knowledge of CM is essential for successful medical practice. Very striking finding is that around 87% compared CM with sociology and there is no need to keep it as post-graduate subject. About 60% students said they would not choose CM as career. 40% students who choose CM as career gave reasons as lots of job opportunities, administrative skills, opportunity to serve community and a good career for females.
Conclusion

Observations drawn from small sample of medical students of deemed university may be limitation. Many students interested in Community Medicine subject but not as career. Non-interest was mainly due to minimal community / field visits and more of calculations. There was not only positive change in life style of many students while learning CM in terms of hygiene, diet, exercise, and smoking but also they knew the importance of subject in PG entrance that carries 20% weightage. Even though few students consider CM amongst top five subjects, it is not popular subject among them. As teachers and public health professionals, has responsibility to teach students with interest and confidence. Teachers need to be more passionate, become role models to make real difference. Active and participatory teaching learning, project and problem based learning, promoting better available text books for creating interest, better utilization of computers and internet, reprioritizing contents, students’ feedback worth to improve teaching / evaluation, community/field exposure of students for better understanding, etc. are suggestions to inspire students. Minimal interaction of students with community and public health services with more of lecture based teaching in Community Medicine in medical institutions may be the key issues. Rather it should be more interactive, student centric, problem solving and evidence based and focus to the community needs.

Declarations: Funding: None

Conflict of Interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Comparison of Various Digital Imaging Software in the Determination of Artificial Proximal Caries-An In Vitro Study

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Abstract

Background: Several new digital systems has been introduced in the world of dentistry for diagnosis of caries. Instantaneous generation of high-resolution digital images and manipulation or processing of the captured image for enhanced diagnostic performance is one among the various advantages. This study was aimed to compare the efficiency of digital imaging softwares in contrast brightness enhancement for caries detection.

Objective: To evaluate the efficiency of digital Imaging software in detecting caries

Materials and Method: 12 extracted teeth were collected. Artificial caries defects were created. They were arranged 3 in blocks made of plaster, bitewing radiographs were taken in contrast brightness mode in various digital radiographic software like Lynx Vision, Vatech, Dentsply Sirona, Carestream Kodak, Vixwin and Dr. Suni and the results were analysed.

Results: The mean value of efficiency for contrast brightness enhancement for each digital radiographic software system was Carestream Kodak (88.1%), Dr. Suni (80.45%), Vatech (72.12%), Vixwin (66.67%), Dentsply Sirona (27.24%), Lynxvision (4.49%). There was a statistically significant difference observed between the weighted mean of contrast brightness enhancement among various digital radiographic software. (one-way ANOVA p<0.01).

Conclusion: Efficiency of Kodak Carestream was higher than the other digital radiographic software in contrast brightness enhancement (p<0.05) for caries detection under the experimental conditions.

Clinical significance: The use of radiographs for the diagnosis of carious lesions has become an inevitable process. Thus the softwares should be developed in such a way that it gives a superior quality facilities and modes for the assessment of initial proximal caries which is not visible to the human eye on clinical examination.

Keywords - Imaging; digital; dental; bitewing; proximal caries

Introduction

Digital radiography is a Recent Advancement in the field of maxillofacial radiology and does not require the use of a conventional radiographic film. The first digital dental radiographic system was the RVG (Radio-Visio-Graphy) system introduced in 1989 by Trophy. Film is replaced by sensors nowadays which sends images to computer. Since then, several companies...
have introduced digital systems specifically for dental imaging. Digital systems have many advantages including lower radiation doses, real time imaging, no requirement for dark rooms, and image manipulation can be easily performed. One of the greater advantages of digital imaging systems that aid in the diagnostic accuracy are the image enhancements such as contrast and brightness adjustment, colour-coded, subtraction, gray-scale reversed, or emboss modulation. In cases with thick crown and large proximal surfaces like in posterior teeth the difficulty arises in detection of early caries development. Hence these lesions need to be diagnosed by clinical examination along with radiography. The current day digital systems display their images in their own software, which have been developed with various differences in their design, ease of use for user, different options for enhancing quality of image.

Thus, this study aims at comparing the efficiency of contrast brightness image processing of six digital x-ray software programs (Vixwin 2000, Carestream Kodak, Lynx Vision, Vatech, Dentsply Sirona and Dr. Suni digital x-ray) in detecting small artificial caries defects on approximal surfaces.

**Materials And Method**

**Preparation of samples**

Twelve extracted human maxillary and mandibular posterior permanent teeth from the orthodontic and periodontal treatment were used. They composed of 8 premolars and 4 molars with no restoration, fracture or caries lesion and had smooth contact surface. High speed diamond bur was used to create 24 small artificial caries defects randomly. The teeth then were mounted in utility wax blocks which contained 2 premolars and 1 molar each to mimic the tooth-soft tissue relationship. A prominent part of proximal surfaces were placed at the same vertical level to simulate normal anatomical contacts. 2 Bitewing radiographs were taken using 6 CCD digital image systems at 70 kVp, 15 milli-amperage for 0.04 seconds. A 12inch source-to-object distance was used with the angle between x-ray beam and teeth long axis of 8 degrees to compensate for the slight bend of the tilt of the maxillary teeth in clinical situation.

**Dental image evaluations**

Dental images were viewed on a monitor screen with help of Carestream Kodak, Lynx Vision, Vatech, Dentsply Sirona, Vixwin and Dr. Suni, which are the image enhancement software programs of the 6 digital image systems mentioned above respectively. The radiographs were enhanced with contrast-brightness. A 14 millimetres thick pink wax, cover the whole detector surface, was placed between the tooth block and x-ray tube to mimic the tooth-soft tissue relationship. Source-to-object distance was 10 inch with the angle between x-ray beam and teeth long axis of 10 degrees each system. 26 interns from Saveetha dental college who were familiar with the digital radiography systems assessed the radiographs from each modality for presence or absence of small carious lesion on proximal surfaces.

**Data analysis**

Radiographs were analysed, mean, Standard deviation was calculated by SPSS Software. To compare the mean difference among various radiographic digital software in contrast brightness, one-way ANOVA with Tukey HSD Post Hoc was performed.

**Results**

The mean values of efficiency for contrast brightness enhancement in proximal caries detection for each radiographic image processing software was calculated. All of the observers had a very good knowledge in the methods of reading a Radiograph.

Figure I- Shows the radiographic image of contrast brightness enhancement among various Digital Imaging Softwares. The Radiographic image for Carestream Kodak is given in Fig.1(a), Vixwin in Fig.2(a), Lynxvision in Fig.3(a).

The mean values and standard deviation of contrast brightness enhancement is given for each radiograph in percentage in Table 1. The mean value of efficiency for each digital radiographic software system was 88.1% for Carestream Kodak, 66.67% for Vixwin, 4.49% for Lynxvision, 72.12% for Vatech, 27.24% for Dentsply Sirona and 80.45% for Dr.Suni. One way ANOVA to compare the mean proportions among various digital radiographic software using contrast brightness enhancement is given in Table 2. There was a statistically significant difference observed between the weighted mean of contrast brightness enhancement among various digital radiographic software. (one way ANOVA p<0.01). Figure II – Depicts the bar graph for
the mean values for contrast brightness enhancement among various Digital Imaging Softwares.

Table 1 – shows the mean and SD for contrast brightness enhancement in % among various digital radiographic software.

<table>
<thead>
<tr>
<th>Digital Software</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Carestream</td>
<td>52</td>
<td>88.14</td>
<td>12.925</td>
<td>1.792</td>
<td>84.54</td>
</tr>
<tr>
<td>Kodak</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vixwin</td>
<td>52</td>
<td>66.67</td>
<td>14.003</td>
<td>1.942</td>
<td>62.77</td>
</tr>
<tr>
<td>Lynx vision</td>
<td>52</td>
<td>4.49</td>
<td>8.162</td>
<td>1.132</td>
<td>2.21</td>
</tr>
<tr>
<td>Vatech</td>
<td>52</td>
<td>72.12</td>
<td>33.613</td>
<td>4.661</td>
<td>62.76</td>
</tr>
<tr>
<td>Dentsply sirona</td>
<td>52</td>
<td>27.24</td>
<td>20.353</td>
<td>2.822</td>
<td>21.58</td>
</tr>
<tr>
<td>Dr.suni</td>
<td>52</td>
<td>80.45</td>
<td>25.506</td>
<td>3.537</td>
<td>73.35</td>
</tr>
<tr>
<td>Total</td>
<td>312</td>
<td>56.52</td>
<td>36.704</td>
<td>2.078</td>
<td>52.43</td>
</tr>
</tbody>
</table>

Table 2- Oneway ANOVA to compare the mean proportions among various digital radiographic software using contrast brightness enhancement

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARIES Between Groups</td>
<td>1026.449</td>
<td>5</td>
<td>205.290</td>
<td>130.371</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>481.846</td>
<td>306</td>
<td>1.575</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1508.295</td>
<td>311</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CARIES ( % ) Between Groups</td>
<td>285124.644</td>
<td>5</td>
<td>57024.929</td>
<td>130.371</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>133846.154</td>
<td>306</td>
<td>437.406</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>418970.798</td>
<td>311</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure I- Shows the radiographic image of contrast brightness enhancement among various Digital Imaging Softwares.
Discussion

The digital radiographs in the present study were evaluated by 26 observers which composed dental interns. The mean value of efficiency for each digital radiographic system was 88.1% for Carestream Kodak, 66.67% for Vixwin, 4.49% for Lynxvision, 72.12% for Vatech, 27.24% for Dentsply Sirona and 80.45% for Dr. Suni with SD of 12.9, 14.0,8.16,33.6,20.35% and 25.5% respectively. Radiograph A showed slightly higher mean values for contrast-brightness enhancement.

Langlais et al. found that a high level of observer disagreement in the case of caries limited to the enamel, although their studies was based on natural carious lesion. Kang et al. carried out a phantom study and reported that the inter examiner reproducibility (kappa value) was 0.43 for detecting the proximal caries and defects. Various factors that may influence the inter observer agreements include scale contrast, time, duration for image evaluation, experience and familiarity of the observers with the digital radiographic systems.

Gotfredsen et al. evaluated observers’ use of image-enhancement facilities and time consumption in assessing approximal and occlusal caries in radiographs taken with four digital systems. They concluded that the observers took advantage of the facilities available for enhancement of density and contrast in digital images. Hintze compared the caries diagnostic accuracy of two software modalities used in the assessment of digital radiographs obtained with four different dental systems. He concluded that there was no significant difference in caries diagnostic accuracy between two software modalities used for examination of digital radiographs obtained with four different digital systems, and the software modality did not influence the mutual rank of the four systems relating to their diagnostic accuracy.

According to various authors such as Syrioupoulos et al., White and Yoon and Castro et al, deeper caries lesions were easier to detect by radiographic systems than relatively superficial ones. The material used in their studies consisted of sound surfaces with artificially induced enamel and dentine caries whereas in the present study, the caries sample was composed of artificially created cavities. Castro et al observed that the detection rate for enamel lesions was rarer in all digital modalities evaluated in their study while the lesions penetrating the dentine, were easier to detect more consistently. Enamel lesions detection has always been an issue in dentistry with the help of radiographs. On the other hand its clinical diagnosis is even harder to perform than radiographic diagnosis. Improved methods have been introduced in order to overcome radiographic limitation in this area.

In Alkurt et al. there was no significant difference between F-speed (flow- x ray) film and direct digital imaging system for proximal caries detection and diagnosis.

In 2007, Berkhout et al evaluated the effect of high and standard resolutions of digital radiography systems and concluded that spatial resolution had no effect on enhancing the diagnosis of caries. Furthermore, the
results showed different functions of sensors in the aforementioned study.  

Li et al., in their study on the effect of resolution of PSP devices showed that scanned images in the Durr VistaScan device did not provide adequate quality for detection of caries and also had significant differences with other resolutions studied.  

Wenzel et al. assessed the effect of spatial resolution on the diagnostic accuracy of caries. In their study, the observers were allowed to use enhancement filters and occlusal caries were also evaluated in addition to proximal caries. They found no significant difference between different resolutions of receptors except for the VistaScan® system. They concluded that diagnostic accuracy of caries is slightly affected by increasing the spatial resolution. Also, significant differences were found between the understudy receptors and it was concluded that Digora® Optime system had higher sensitivity and lower specificity than the other systems. 

Mehdizadeh et al., concluded that changing the resolution had very little effect on the diagnostic accuracy for detection of proximal caries and the standard resolution of the understudy systems had insignificant superiority over their high resolution for caries diagnosis. Moreover, they reported that the results of interpretation of radiographs obtained by Schick system at standard resolution had the highest similarity to pathologic examination results compared to other systems. Superiority of Schick over Soredex system in their study may be attributed to the higher spatial resolution of CMOS systems over PSP. However, they had a small sample size and extent and distribution of caries were not specified; these factors may have affected the obtained result.  

Recent studies that evaluated the accuracy of interpretation of various radiographic methods showed differences in the diagnosis between individual observers. These difference might have been due to differences in experience, training or visual perception. Stookey and others reported that differences in diagnostic performance as a limitation of the radiographic interpretation of the high degree of variability of intra and inter-observers. According to Dunn and Kantorment who stated that the art of radiographic interpretation is an activity of high cognitive level which can be associated with the knowledge and experience of the examiner. 

**Conclusion**

In summary, this in vitro investigation has demonstrated that the Kodak Carestream and Suni digital imaging software system is almost equivalent in terms of efficiency for contrast brightness enhancements for carious lesion detection under the experimental conditions. This further indicates a deeper research with experienced observers using other enhancement features of commercially available dental digital imaging systems.

**Conflict of Interest** – Authors have no conflict of interest

**Source of Funding**- Nil

**Ethical Clearance** – Nil, Invitro study

**References**


Integrated Clinical Experience on Clinical Skills and Self-Esteem

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Abstract

Background: The need for new clinical teaching models to provide quality experiences for student nurses to bridge the theory practice gap has been realized long back. Newer preceptorship models like integrated clinical experience (ICE) can develop competence and confidence. The process of learning clinical decision making must be practiced during nursing education programs.

Objective: To evaluate the perceived effect of ICE on clinical skills and self-esteem among undergraduate nursing students.

Method: Quantitative, One group pre test post-test design. Data was collected from 139 final year undergraduate nursing students using total enumerative sampling. The students were given clinical experience continuously for a month in one clinical area in two shifts under a professional registered nurse. The students’ perceptions on clinical skills were assessed using self developed Questionnaire and self esteem using Rosenberg self-esteem scale before and after ICE.

Results: The perceived effect of ICE on all the twenty clinical skills and self esteem were found to be statistically significant (p value <0.001). The pre and post percentages of the sample on three levels of self esteem were – low self esteem 8.6/2.2, normal 90.7/84.9 and high 0.7/12.9.

Conclusion: ICE can smoothen the role transition from student to professional nurse as it affects the clinical skills and self esteem which are central to clinical decision making. However the preceptor’s attributes, competency and training on preceptorship are influencing factors to be ensured for better outcomes.

Keywords: Perceived effect, ICE, clinical skills, self esteem.

Introduction

Clinical decision making (CDM) is a “cornerstone skill for nurses”.[1] They are generally the first to observe cues in patients which may warrant making a clinical decision. Bakalis and Watson (2005) proclaim that nurses who make effective clinical decisions provide safer, more competent nursing care.[2] Thompson (2002) further declares that the quality of health care is dependent upon the “clinical decisions of the professionals delivering it”. Effective CDM “is the principal skill that separates professional nursing personnel from ancillary or technical personnel and differentiates a novice from an expert”.[3] The process of learning CDM must not begin as a graduate nurse; it must be introduced and practiced during nursing education programs.

Currently the B.Sc Nursing course in India is a 4 year programme that has 2115 hrs of theory (21 subjects) & 3795 hours of clinical practice (>100 areas) along with clinical assignments. As the course covers almost all broad and super specialty areas of medicine and

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nursing, often the students are rotated too frequently from one area to another. Moreover, the clinical assignments the students have to complete in time exert lot of strain and stress on them. They get hardly time to get acquainted with the protocols and policies in patient care, professional communication during this flow. Hence as novice nurses they become panic and go into what is usually described as “reality shock”.

In developed countries the gap in the beginning of practice is bridged with adaptation courses. ICE provides students an opportunity to integrate academic knowledge and skills with practical experience while concurrently completing course work in the academic programme. ICE is focused on the foundation of clinical practice and the development of professional behaviors.

In 2011 American Association of Colleges of Nursing in their Essentials of Baccalaureate Education for Professional Nursing Practice identified the need for additional and new clinical teaching models to provide quality experiences for students and to bridge the gap between nursing school and the reality of the new professional nursing role. Educational clinical placements using the preceptor model may be beneficial in the role transition of a student to a professional nurse. This one-to-one role-modeling experience can increase student learning, efficiency and self-confidence.

Although there are many studies about student self-confidence in general there is limited research on how preceptor courses affect student perceptions related to their clinical skills and self esteem.[5-8]

In reviewing the literature on the value of the preceptor model for clinical teaching, studies confirm positive outcomes for role socialization.[9] The preceptor’s knowledge and experience provide the main asset to student learning.[10]

Based on these reviews, the investigators wanted to explore the perceived effect of ICE on the clinical skills and self-esteem of the final year undergraduate nursing students presuming to shape the nurses of tomorrow.

Methodology

A quantitative, one group pre test post-test design was used for the study. Data was collected from 139 final year undergraduate nursing students using total enumerative sampling. The students were given clinical experience continuously for a month in one clinical area in two shifts under a professional registered nurse.

The following tools were used to collect data from the sample.

Tool 1: Questionnaire on sample characteristics

Tool 2: self developed Questionnaire on Perception of clinical skills.

Clinical skills had two sets of questions. Set – 1 included 10 questions on various aspects of comprehensive nursing care like assessment, planning and providing prioritized nursing care, health education and documentation. Clinical skills set- 2 included 10 questions on general aspects in patient care, formalities related to patient insurance and accreditation, policies and protocols.

Tool 3: The Rosenberg self-esteem scale.

A four point likert scale of self report measure of self esteem with an internal consistency ranging from 0.77-0.88, reliability 0.82 – 0.85 and validity 0.55. The scale has ten statements. The scoring is as follows; low self esteem < 15, normal 15-25 and high self esteem > 25. The higher the score the better is the self esteem.

Ethical Consideration

Ethical clearance was obtained from the Institutional Ethical & Scientific Committee before data collection. Informed written consent was obtained from each subject.

Results

Table 1: Sample characteristics  N= 139

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-24</td>
<td>138</td>
<td>99.3</td>
</tr>
<tr>
<td>25-30</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>2.9</td>
</tr>
<tr>
<td>Female</td>
<td>135</td>
<td>97.1</td>
</tr>
</tbody>
</table>

All the subjects except one were within the age group 19- 24 years. Majority(97.1 %) were females.
Table 2: Mean difference (pre and post) in the clinical skills set-1 as perceived by the sample. \( N=139 \)

<table>
<thead>
<tr>
<th>Clinical skills</th>
<th>Mean Difference</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence in history taking from a patient</td>
<td>0.799</td>
<td>.886</td>
<td>10.625</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Skill in physical examination</td>
<td>0.827</td>
<td>.884</td>
<td>11.033</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to provide nursing care based on the disease condition of the assigned client(s)</td>
<td>0.978</td>
<td>1.018</td>
<td>11.334</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to understand/prepare the assigned patients for the diagnostic tests</td>
<td>1.014</td>
<td>1.056</td>
<td>11.322</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to identify nursing problems of the patient</td>
<td>0.791</td>
<td>.952</td>
<td>9.805</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to prioritize the patient needs</td>
<td>0.777</td>
<td>1.043</td>
<td>8.784</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to provide appropriate nursing interventions</td>
<td>0.741</td>
<td>.973</td>
<td>8.978</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to administer medications</td>
<td>1.151</td>
<td>1.007</td>
<td>13.482</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Awareness on the potential complications of assigned patient’s illness</td>
<td>0.719</td>
<td>1.043</td>
<td>8.134</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to document patient care</td>
<td>0.892</td>
<td>1.127</td>
<td>9.330</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The mean differences in all the ten clinical skills of set -1 were found to be significant; more so in ability to administer medications (1.151) and ability to understand/prepare the assigned patients for the diagnostic tests (1.014).

Table 3: Mean difference (pre and post) in the clinical skills set-2 as perceived by the sample. \( N=139 \)

<table>
<thead>
<tr>
<th>Clinical skills</th>
<th>Mean Difference</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to rationalize nursing interventions</td>
<td>0.770</td>
<td>1.002</td>
<td>9.055</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Confidence in giving appropriate instructions to the clients</td>
<td>0.705</td>
<td>1.003</td>
<td>8.285</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to apply theoretical knowledge into practical skills</td>
<td>0.741</td>
<td>1.038</td>
<td>8.417</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to handle equipment used in patient care</td>
<td>0.971</td>
<td>1.148</td>
<td>9.974</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Awareness on policies and protocols in the assigned clinical area</td>
<td>1.058</td>
<td>1.020</td>
<td>12.225</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to communicate effectively with patients and relatives</td>
<td>0.719</td>
<td>.963</td>
<td>8.805</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to communicate effectively with other health professionals</td>
<td>0.813</td>
<td>1.087</td>
<td>8.815</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Efficiency in working as a team</td>
<td>0.791</td>
<td>.974</td>
<td>9.578</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ability to deal with patient insurance formalities</td>
<td>0.813</td>
<td>1.094</td>
<td>8.762</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Awareness on hospital accreditation formalities</td>
<td>0.799</td>
<td>1.111</td>
<td>8.474</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The mean differences in all the ten clinical skills of set -2 were found to be significant; more so in awareness on policies and protocols in the assigned clinical area (1.058) and ability to handle equipment used in patient care (0.971).
Table 4: Distribution of the sample based on the levels of perceived self esteem

N= 139

<table>
<thead>
<tr>
<th>Levels of self esteem/ score</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Low self esteem (&lt;15)</td>
<td>12</td>
<td>8.6</td>
</tr>
<tr>
<td>Normal (15-25)</td>
<td>126</td>
<td>90.7</td>
</tr>
<tr>
<td>High self esteem (&gt;25)</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

The percentage of subjects with low self esteem before ICE was 8.6 %, where as it was only 2.2 % after ICE. There was an increase in the percentage of subjects who perceived a high self esteem from 0.7 to 12.9.

N= 139

![Distribution of the sample based on the levels of perceived self esteem](image)

Figure 1: Distribution of the sample based on the levels of perceived self esteem

Table 5: Over all perceived effect of ICE on self esteem in the sample.

<table>
<thead>
<tr>
<th>Self esteem</th>
<th>Mean difference</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>-2.842</td>
<td>4.157</td>
<td>-8.060</td>
<td>138</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table shows that there was a perceived effect of ICE on self esteem in the sample which was statistically
significant at p value <0.001.

Discussion

The present study was conducted among 139 undergraduate student nurses mostly (99.3%) in the age group 19-24 years with an objective of exploring their perceived effect on ICE on their clinical skills and self esteem. 97.1% of the sample were females.

The mean differences in all the twenty clinical skills (both set-1 and set-2) assessed were found to be statistically significant specially in ability to administer medications (1.151) and ability to understand/prepare the assigned patients for the diagnostic tests (1.014) in set-1 clinical skills. In clinical skill set-2 it was noted in awareness on policies and protocols in the assigned clinical area (1.058) and ability to handle equipment used in patient care (0.971). The perceived effect of ICE on self esteem also was found to be statistically significant at p value <0.001.

Similar findings were observed in a study to Improve Clinical Competence and Confidence of Senior Nursing Students (sample 95) through Clinical Preceptorship by Kimberly H. Kim et al. in USA, California(2014).[11] Results indicated that the clinical preceptorship improved students’ perceived competency skills and confidence in providing nursing care. However the tools used were Senior Preceptorship Experience Questionnaire, Graduate Nurse Survey, and Quality and Safety Education for Nurses tools.

The present study findings are also in tune with a Chinese study (2017) using preceptors to improve nursing students’ clinical learning outcomes: A Malawian students’ perspective by Ngaiyaye EP, Bvumbwe T, MCur and Chipeta MC revealed a gain in confidence and competence in clinical practice when supported by preceptors.[12]

Another study was conducted by Berry (2005) on nursing students’ satisfaction and perceptions of achieving the objectives of a clinical course after completing a preceptored clinical experience compared to students completing a traditional clinical rotation. The preceptor model was identified as a positive experience since it provided immersion into the RN role in a safe environment.[13] Myrick’s (2002) identified the one-to-one relationship as a “safety net”- there was always someone there to answer students’ questions. Both of these studies found that the one-to-one relationship contributed to students’ self-confidence and competence in performing skills and the development of their ability to think critically.[14]

Review of literature also has shown that ICEs are used in other professional courses like physical therapy yielding better outcomes. The feedbacks were obtained not only from the students but also from faculty and patients and were found to be meeting their intended goals and highly satisfactory.[15] An Australian study (2012) by McNamara J et al. on work-integrated learning (WIL) as a component of the capstone experience in undergraduate law presents an argument for the inclusion of WIL as a component of a capstone experience.[16]

The investigators could not come across any studies which did not have an impact on competencies and confidence among any category of students who underwent the so called ICE or capstone experience. Still it is quite surprising and worth exploring to identify the barriers in integrating such an effective model.

Conclusion

ICE can smoothen the role transition from student to professional nurse as it affects the clinical skills and self esteem which are central to clinical decision making. However the preceptor’s attributes, competency and training on preceptorship are influencing factors to be ensured for better outcomes.

Conflict of Interest: Nil

Source of Funding: Self

References

3. Thompson C. Human error, bias, decision making and judgement in nursing-the need for a systematic approach. Clinical decision making and judgement


Simulation Based Learning in Selected Clinical Skills among Nursing Students in Selected Nursing College of Pune

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¹Assoc. Professor, ²Asst. Professor, Symbiosis College of Nursing, Symbiosis International (Deemed University), Pune

Abstract

Simulator METIman is considered high fidelity, prehospital/nursing modal to teach the fundamentals of nursing practice, which is a computerized manikin that stimulates the real life settings. Method: Quantitative research approach, Pre-experimental one group Pre test - Post test research design adopted for the study. The samples were 60 nursing students. Simple Random sampling technique was used. Tool included; Demographic Proforma of the sample & Checklist was used to assess the skills on selected clinical skills. Reliability of tool was 0.86. Pretest followed by Simulation based learning by use of METIman that simulates with the control of computer, for performing the selected clinical skills i.e. Cardio Pulmonary Resuscitation, Tracheostomy suctioning, Auscultation of various normal and abnormal heart and lungs sounds and rate, rhythm of respiratory system; followed by Post test. Result: Majority of 57% of the student nurses had poor skill score, 42% of them had average skill score and only 2% of them had good skill score, Paired t-test applied. T-value was found to be -12.668 with 59 degrees of freedom. Corresponding p-value was found to be very small (of order of 0.001) the null hypothesis H₀ is rejected and hence H₁ is accepted, indicates simulation based learning had significantly improved the skill of the nursing students. Majority of nursing students are of excellent opinion regarding simulation based learning to enhance the clinical skill. Discussion: The findings of the present study revealed that simulation based learning is effective advanced technology to improve the clinical skill among nursing students. Similar findings were observed in study where use of simulation to teach Cardiopulmonary Resuscitation skills was effective as the number of attempts required by nursing students is less.

Keywords: Simulation based learning; Clinical skills; Nursing student.

Introduction

Today’s practicing nurses are challenged by a rapidly changing healthcare arena that demands highly skilled and adaptive responses. There are different types and classification of simulators that varies according to the degree of their resemblance to the reality, Such as Low-fidelity, medium-fidelity and high fidelity[1]. Simulator METIman is considered high fidelity, prehospital/nursing modal to teach the fundamentals of nursing practice, which is a computerized manikin that stimulates the real life settings. METIman comes with standard equipment that allows students and trainers the ability to create a number of possible clinical circumstances. It derives with wide-ranging clinical features and skills designed precisely for emergency medical team and nurses. METIman proceeds simulation learning to a new and inspiring level of practicality. METIman is the perfect crony for patient simulation. In Nursing, it is a type of reflective exercise in which nursing students practice and review their performances and realize how teaching is actually is applied to skill and receives feedback from the trainer.

Need of the study

Simulator (METIman) is designed to deliver the most realistic training possible whilst remaining easy to set up and simple to operate. METIman is easy to use learning features that are designed for teaching basic nursing and pre-hospital skills in order to avoid medical/Nursing error. Medical errors affect one in 10 patients worldwide. In 2013 study, the Harvard University
estimated that India has recorded 5.2 million injuries each year due to medical errors and adverse events. WHO lists India among the top 10 killers in the world due to medical errors? The reason behind this is that we have not trained doctors and Nurses to measure the clinical outcomes; this is why practice of clinical skills on medical simulation proves to be the most effective way to bring down the medical / nursing error. [2]

A study on Analysis of an opinion on low versus high fidelity simulation among Nursing students in 2017 have revealed that High fidelity simulation is more effective than the low fidelity simulation according to the opinions of Nursing students. A significant association was found between the opinion score and previous training and workshop. [3] The present study seeks to empower Nurses with advanced teaching technology i.e simulation based learning improvising clinical skill in the Nursing Practice.

Statement of the problem

“Simulation Based Learning in Selected Clinical Skills among Nursing Students in Selected Nursing College of Pune”

Objectives:

1. To assess the Selected Clinical Skills among Student Nurses.

2. To evaluate the Effectiveness of Simulation Based Learning in Selected Clinical Skills among Nursing Students.

Hypothesis:

H₀ - There is no significant difference between Pre test and Post-test skill score of Nursing students on Simulation Based Learning.

H₁ - There is significant difference between Pre-test and Post-test skill score of Nursing students on Simulation Based Learning.

Methodology: Quantitative Research approach was adopted in the study. Pre-experimental one group Pre test - Post test research design adopted for the study. The samples were 60 Nursing students. Simple Random Sampling technique was used. Tool was developed in two Sections: Section I: Demographic Proforma of the sample ; included age, gender, Nursing programme and Exposure to simulation based training previously. Section II: Checklist was used to assess the skills on selected clinical skills. Checklist had 42 statements. The experts validated the relevancy, objectivity and appropriateness in tool. Reliability of tool was calculated by Cronbach’s alpha method and was 0.86

The permission to conduct the study was taken from the administration department of Nursing college. The period of data collection commenced from March 2017 to April 2017. After taking the consent from the subjects, the investigator has administered Pre test to respondents following which Simulation based learning was taken by use of METIman that simulates with the control of computer, for performing the selected clinical skills i.e. Cardio Pulmonary Resuscitation, Tracheostomy suctioning, Auscultation of various normal and abnormal heart and lungs sounds and rate & rhythm of respiratory system; followed by administration of Post test from same respondents.

Findings: Based on the objectives and the hypothesis the data was analysed using both descriptive and inferential statistics.

Section I: Description of demographic variables in terms of frequency and percentage   N=60

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-21 yrs.</td>
<td>46</td>
<td>77</td>
</tr>
<tr>
<td>22-25 yrs.</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>06</td>
<td>10</td>
</tr>
<tr>
<td>Female</td>
<td>54</td>
<td>90</td>
</tr>
<tr>
<td>Nursing programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.Sc. (N) 3rd Year</td>
<td>38</td>
<td>63</td>
</tr>
<tr>
<td>B.Sc. (N) 4th Year</td>
<td>22</td>
<td>37</td>
</tr>
<tr>
<td>Exposure to simulation based training previously</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Nil</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Section II: An analysis of data related to the skill score on clinical skills among student nurses

Majority of 57% of the student nurses had poor skill score (0-14), 42% of them had average skill score (15-28) and only 2% of them had good skill score (29-42)
Section III: Analysis of data related to effectiveness of simulation based learning on selected clinical skills among student nurses N=60

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper</td>
<td>-12.668</td>
<td>59</td>
<td>.001</td>
</tr>
<tr>
<td>Post test</td>
<td>29.83</td>
<td>5.869</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Paired t-test applied for comparison of pre-test and post-test skill scores among nursing students on simulation based learning. T-value was found to be -12.668 with 59 degrees of freedom. Corresponding p-value was found to be very small (of order of 0.001). Since the p-value is very small (< 0.05), the null hypothesis $H_0$ is rejected and hence $H_1$ is accepted. In Pre test, average skill score was 14.42 with standard deviation of 6.168 whereas in post-test average skill score was 29.83 with standard deviation of 5.869. This indicates that the simulation based learning had significantly improved the skill of the nursing students regarding simulation based learning.

**Discussion**

The findings of the present study revealed that simulation based learning is effective advanced technology to improve the clinical skill among nursing students. Checklist was used to assess the skills among the nursing students. Similar findings were observed in the study conducted by Adhyapak; use of simulation to teach Cardiopulmonary Resuscitation skills was effective as the number of attempts required by nursing students is less. Researches had used the checklist to assess the CPR skills among the nursing skills.[4]

**Recommendation**

A comparative study can be conducted among nursing students and nursing staff.

A similar study can be undertaken in domain like knowledge and attitude of simulation based learning.

A similar study can be replicated on a large sample.

**Conclusion**

It is concluded from the study findings that the skills of nursing students was poor before the administration of simulation based learning on selected clinical skills. The simulation based learning helped nursing students to enhance the clinical skills which was evident in the post test skill score. There was a statistical significant difference between pre test and post test skill scores. Hence the simulation based learning been proved to be an effective strategy for enhancing the skill of nursing students. Nurses, regardless of specific qualifications, should receive and undergo simulation based learning to enhance clinical skills. Simulation creates experiential learning, which has been shown to help learners, which are necessary for safe and effective clinical practice. It is concluded that advance technologies are essential to acquire the ability to recognize and respond to clinical emergencies and for ascertaining competency.

**Conflict of Interest**: Nil

**Source of Funding**: Self-funded

Ethical Clearance: Study was approved at Institute Ethical Committee. Study was started after obtaining permission from college Authority. Informed consent from each students been taken.

**References**

Correlation between Nuclear Density of Age related Cataract and Effective Phaco Time in Phacoemulsification Surgery in a Semi Urban Hospital

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Abstract

Objective: To correlate effective phaco time in continuous mode of phacoemulsification surgery in different grades of nuclear cataract.

Materials and Method: Cataract was graded according to LOCS III classification system under slit lamp examination. Ninety consecutive Patients of 44 male and 46 female undergoing phacoemulsification surgery were included in this study. Phacoemulsification was conducted using Carl Zeiss Model –Visalis 100 phaco machine under constant setting in continuous mode. The total Phaco time and the Effective phaco time displayed on the panel were recorded meticulously for each surgery.

Result: Of the total Ninety patients, 8 had grade I, 11 grade II, 31 grade III, 24 grade IV and 16 grade V. The mean Effective Phacoemulsification Time for grade I, for male was 48.83 seconds and for female 37.50 seconds; Under grade II, for male was 57.20 seconds and for female 46.17 seconds; Under grade III, for male was 64.76 seconds and for female 63.50 seconds; Under grade IV, for male was 63.50 seconds and for female 87.42 seconds; Under grade V, for male was 72.00 seconds and for female 88.00 seconds.

Conclusion: No difference in incidence of number of cataract in male (48.9\%) and female (51.1\%). Higher the grade of nuclear Cataract more is the effective phaco time in conventional coaxial continuous mode.

Keywords: Cataract, Effective Phaco time, LOCS III Classification, Phacoemulsification

Introduction

Cataract is the commonest form of blindness can be cured. Goal of cataract surgery is restoration of vision by removing cataractous lens with putting an intraocular lens in the place resulting to high quality instant visual and systemic rehabilitation. Lens opacities classification system, version III (LOCS III) classify cataract into Nuclear 1-6 grades as per nuclear opalescence (NO) and nuclear colour (NC), cortical (C) 1-5 grades and posterior subcapsular (P) 1-5 grades\textsuperscript{12}.

Phacoemulsification technique is the present day accepted method of surgical procedure in all the grades\textsuperscript{3}. Age related cataract affect centre of nucleus (Nuclear), Posterior aspect of lens (Posterior sub capsular) and edge of lens (cortical). Nuclear cataract is most common type.

Dr Charles Kelman invented Phacoemulsification in 1960 and first performed phaco surgery in Human eye in 1967\textsuperscript{1}. In Phacoemulsification the phaco tip oscillate at about frequency of 40 KHZ/Sec. which
is constant and delivered in continuous, pulse, burst, hyperpulse and hyperburst modes. The stroke length of phaco needle could be of longitudinal, transverse or torsional depending on phaco machine configuration\textsuperscript{4,5}. Longitudinal stroke length is 2-4mils (one thousandth of inch) in most machines\textsuperscript{6}. Longitudinal movement of phaco tip cause jack hammer effect and cavitation on the lens\textsuperscript{7}. It also create fluid and acoust wave causing break down of nucleus. The longitudinal movement of phaco needle varies in phacoemulsification surgery on foot pedal control. Foot pedal positions are: 0 – Rest position, 1 - Irrigation, 2 – Vacuum, 3 – Ultrasound energy active and goes on.

Basic setting is continuous in which US energy is delivered continuously with variable power; controlled by foot pedal depression without off period\textsuperscript{7,8}. Phaco power is delivered continuously can be linear or panel mode. In Linear control on depressing more in foot pedal position 3, the stroke length of phaco needle increases and power rises from zero to preset level\textsuperscript{9,10}. It operated by surgeons suitability depending on cataract grade.

All other modes ie; Pulse, Burst, Hyperpuls and Hyperburst modes are not continuous but having US on and off period\textsuperscript{6,7,8,10}. In Pulse mode there is phaco on and off period and power is linearly controlled by foot pedal depression which is of <20 pulses / second of fixed power. The ultrasound energy used is 50% less than continuous mode. In Hyperpulse mode high pulse of US energy > 100 pulse / second is delivered using less phaco energy but gives same effect as continuous. In Burst mode burst of phaco is delivered with a variable off period and US is delivered is of 80 milliseconds in minute. It is continuous on last position of 3rd position of foot pedal depression\textsuperscript{8}. In HyperBurst mode US is delivered in milliseconds as short as 4 ms results less phaco energy and less heat and it is continuous.

Phaco power is set in the panel as per nuclear hardness and variability is controlled by foot pedal excursion. It creates mechanical impact on lens, cavitation and implosion producing heat, cooled by irrigating fluid preventing damage.

Disadvantages of continuous mode are thermal injury to ocular tissues and decrease flowbility which can be controlled by Linear phaco power. Delivering 100% US energy for 20 seconds is equivalent to 50% energy for 40 seconds. Phaco time and phaco power should be less to decrease complications; carried out on foot pedal control and phaco power setting on linear mode. Less power will fail to cut but push the nucleus mechanically causing zonular stress and high power will cause chattering of nucleus and may pierce the nucleus causing posterior capsule rent, wound burn, endothelial loss. For sculpting 50% to 100% power is required depending on nuclear hardness. For soft cataract less power and more vacuum required. Objective is to generate less air bubble. After cracking further divisions if required, require lesser power setting. Lesser EPT gives rise to clearer cornea, better vision on Post-operative period and higher patient satisfaction\textsuperscript{5}. The foot pedal is pressed more or less as per nucleus hardness in continuous mode. Total phaco time is the time duration of foot pedal position 3 where as, Effective phaco time measures the US energy used if 100% power used for the purpose It is calculated by the phacomachine. Different phaco modulations can be adjusted by setting in the machine\textsuperscript{6}. Lesser the total phaco time correspondingly less EPT, results clearer cornea and better visual outcome postoperatively, higher patient satisfaction, less endothelial damage and late complications like pseudophakic bullous keratopathy. Cataract hardness is directly proportional to the effective phaco power used under different settings.

Phacoemulsification deals with emulsification of the Cataractous nucleus by basic techniques like Trench Divide Conquer Nucleofractis (TDC ) and Crater Divide Conquer Nucleofractis (CDC ). CDC is advocated in dense total cataract where TDC is difficult. But standard technique is TDC inside the capsular bag which can be performed with / without nuclear cleavage. Other techniques like chip and flip, stop and chop, bimanual nuclear tilt etc, are surgeon preference.

Materials and Method

A total of Ninty Patients were selected randomly within the study period of one year from April 2017 to March 2018; those had undergone Phacoemulsification cataract surgeries in a private sector eye hospital of Dhenknal Town in Odisha. This study adhered to the declaration of Helesinki and approval for the study was obtained from Hospital ethics committee. Informed consent, risk benefit of surgery, Patient s demographic data, Hardness of cataract, EPT, type of Phaco technique, phaco modes and settings, were documented.
All the Phacoemulsification cataract surgeries were conducted using the Same Phaco Machine Carl Zeiss Model - Visalis 100 by Dr Arun Samal. Nuclear hardness were graded according to LOCS III classification grading system on Slit lamp examination.

Preoperative examination and inclusion criteria were: patients age more than 40 years, clear cornea, normal intraocular pressure, anterior chamber depth and normal pupil dilatation > 6mm. Exclusion criteria were raised intraocular pressure, corneal pathology, shallow anterior chamber depth, zonular dialysis, complicated cataract, retinal pathology, glaucoma, small pupil, pseudoexfoliation and previous ocular surgeries. All the patients conforming inclusion and exclusion criteria were included in the study. Patients were explained the ocular condition, the surgical procedure and risk of complications. Informed consent was taken from the patient and attending relative.

Routine pre-operative systemic investigations were carried out like blood pressure, Fasting and post prandial blood sugar, urine examination. Ophthalmological work up of visual acuity for distance and near, Slit lamp examination, Intra ocular pressure, lacrimal sac Irrigation, Fundoscopy and physical fitness were taken. Slit lamp examination carried out for grades of cataract with low magnification slit beam at 45 degree angulation. Slit beam height was adjusted little more than the pupil diameter and width was adjusted for clear view in hazy cortex, illumination was increased for nucleus to be viewed. Grading of Hardness of the Nucleus was done as per colour code laid down in Lens Opacity Classification system, (LOCS III).

Preoperative patient preparation done with Tropicamide 1% and phenylephrine 2.5% eyedrop; instilled 3 times at 15 minutes interval before 1 hour of surgery. Aseptic cleaning of lid and brow with 10% povidone Iodine solution was done. 5% topical povidone iodine solution instilled 5 minutes before surgery. Anaesthetic preparation consists of peribulbar infiltration of 2% xylocaine with adrenaline 1:200 000 mixed with Hyaluronidase. Balanced salt solution used as Irrigating solution in all the cases, Bottle Height was kept at 110 cm above the patients head level.

Anterior Chamber entry was made by a two planar 2.8mm Limbal incision in 10.30 o clock position in all the eyes. Viscoelastic healon was used. About 5mm Continuous curvilinear capsulorrhexis made by Uttrata capsulorrhexis forceps. Hydrodissection and hydrodelineation done. Phacoemulsification carried out in conventional coaxial procedure of 2.8 mm limbal entry in continuous mode on linear setting. Endcapsular Phacoemulsification carried out by Trench divide and conquer Nucleofractis (TDC) technique. Phaco machine parameters were phaco power 50, Vacumm 60 mm Hg, Flow rate 25. A + designed trench is made with a width of about two times the phaco tip diameter in the nucleus. Nucleus is fractured with the help of a second instrument from the side port. Phaco parameter was unchanged in trenching and emulsification of nuclear fragments. Cortical cleaning was done and Acrylic foldable intraocular lens was put in capsular bag. The total phaco time and effective phaco time were noted down meticulously in each case. Anterior chamber was washed, inflated and entry site hydrated with irrigating solution. All patients were advised to instill topical antibiotic steroid combination on tapering doses up to 1month and followed up at 1st day, 1st week and 4th week postoperatively. Details of preoperative work up, intraoperative procedure and post operative follow up were recorded in the patients individual case sheet.

Result

During the one year period of study a total of 90 patients had undergone cataract surgery through phacoemulsification procedure; out of which 44 (48.9%) were male and 46 (51.1%) female. Within the age group of 40 – 50 years there were 10 (11.11%) patients, in 51-60 years 39 (43.33%) patients, in 61-70 years 41 (45.56%) patients [Table 1]. Under Grade I cataract, there were 8 patients; Grade II,11 patients; Grade III, 31 patients; Grade IV, 24 patients and under Grade V, 16 patients (Table 2). The mean age of male patient was 59.3 years with a standard deviation of 6.18 and for female 57.6 years with a standard deviation of 7.05. The mean age of both the males and females was 58.44 years with a standard deviation of 6.69.
Table 1. Age-group wise distribution of Cataract patients

<table>
<thead>
<tr>
<th>Age-group</th>
<th>No. Of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-50</td>
<td>10</td>
<td>11.11</td>
</tr>
<tr>
<td>51-60</td>
<td>39</td>
<td>43.33</td>
</tr>
<tr>
<td>61-70</td>
<td>41</td>
<td>45.56</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Age-group and Grade wise distribution of Cataract patients

<table>
<thead>
<tr>
<th>Age-Group</th>
<th>Grade I</th>
<th>Grade II</th>
<th>Grade III</th>
<th>Grade IV</th>
<th>Grade V</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-50</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>51-60</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>61-70</td>
<td>0</td>
<td>4</td>
<td>17</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>11</td>
<td>31</td>
<td>24</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 3. Mean effective PHACO time (EPT) in seconds for male and female patients in different grades of Cataract

<table>
<thead>
<tr>
<th>Sex</th>
<th>Grade I</th>
<th>Grade II</th>
<th>Grade III</th>
<th>Grade IV</th>
<th>Grade V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>48.83</td>
<td>57.20</td>
<td>64.76</td>
<td>63.50</td>
<td>72.00</td>
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<tr>
<td>Female</td>
<td>37.50</td>
<td>46.17</td>
<td>60.71</td>
<td>87.42</td>
<td>88.00</td>
</tr>
<tr>
<td>Both</td>
<td>46.00</td>
<td>51.18</td>
<td>63.16</td>
<td>75.46</td>
<td>84.00</td>
</tr>
</tbody>
</table>

Figure 1. Mean Age of the patients with Cataract grades
Table 4. ANOVA test for comparison of Mean EPT in different grades

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Grade I</th>
<th>Grade II</th>
<th>Grade III</th>
<th>Grade IV</th>
<th>Grade V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>8</td>
<td>11</td>
<td>31</td>
<td>24</td>
<td>16</td>
<td>90</td>
</tr>
<tr>
<td>∑x</td>
<td>368</td>
<td>563</td>
<td>1958</td>
<td>1811</td>
<td>1344</td>
<td>6044</td>
</tr>
<tr>
<td>Mean</td>
<td>46</td>
<td>51.18</td>
<td>63.16</td>
<td>75.46</td>
<td>84.00</td>
<td>67.16</td>
</tr>
<tr>
<td>∑x²</td>
<td>22526</td>
<td>32165</td>
<td>137206</td>
<td>163519</td>
<td>134878</td>
<td>490294</td>
</tr>
<tr>
<td>S.D.</td>
<td>28.28</td>
<td>18.30</td>
<td>21.24</td>
<td>34.17</td>
<td>38.28</td>
<td>30.79</td>
</tr>
</tbody>
</table>

Table 5. F – Value of ANOVA Test of Significance

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of squares</th>
<th>Degree of freedom</th>
<th>Mean sum of squares</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between grades</td>
<td>13076.03</td>
<td>4</td>
<td>3269.00</td>
<td>F =3.8955</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p value = 0.00593</td>
</tr>
<tr>
<td>Within grades</td>
<td>71329.79</td>
<td>85</td>
<td>839.174</td>
<td>Significant at p&lt;0.05</td>
</tr>
<tr>
<td>Total</td>
<td>84405.82</td>
<td>89</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Those having nuclear grade 1 cataract had a mean age of 56 years; grade II, 55.9 years; Grade III, 58.87 years; Grade IV, 59.56 years and Grade V, 60 years [Figure – 1]. Mean effective phaco time (EPT) for each individual case was recorded against different grades of cataract. The mean EPT for grade I was 46 seconds with a SD of 28.28; for grade II, 51.18 seconds with a SD of 18.30; for Grade III, 63.16 seconds with a SD of 21.24; for grade IV, 75.46 seconds with a SD of 34.17 and for grade V, 84 seconds with a SD of 38.28 (Table 3). For male patients the mean EPT for grade I, grade II, grade III, grade IV and grade V were 48.83, 57.20, 64.76, 63.50 and 72.00 seconds respectively. For female patients the mean EPT for grade I, grade II, grade III, grade IV and Grade V were 37.50, 46.17, 61.21, 87.42 and 88.00 seconds respectively (Table 2).

Analysis of variance (ANOVA) test was conducted on total cases in which F=3.8955 with 4 degree of freedom for between grades and 85 d.f. for within grades. The ANOVA test was found to be statistically significant at p < 0.05 with p value = 0.00593. Further sex wise one way ANOVA was conducted. For male patients F = 0.8647 with p value = 0.4936 which indicated that the test is not statistically significant at p < 0.05. For female patients F = 3.0265 with p value = 0.028 which indicate that the test is statistically significant at p < 0.05.

Discussion

In this study Peribulbar anaesthesia was given in all cases. CCC Performed in all cases and bottle height kept constant. Phacoemulsification carried out in 90 eyes of 90 patients of Grades 1 – 5. Phacoemulsification done in conventional coaxial 2.8 mm limbal entry in continuous mode of constant power in linear setting both for trenching and emulsification in all the grades of cataract. The mean of Effective phaco time is more in higher grades of nuclear sclerosis than lower grades. Mean EPT is more than other phaco modulations and other phaco techniques. EPT is less in Direct chop technique stated by Ramamurthy LB et al11. Ahn DS et al12, stated less EPT in conventional Pulse mode. This study correlates to other studies13,14. For trenching continuous mode is better than other modes. Again mean EPT is more in higher grades of cataract in continuous mode than Burst and pulse modes.

Conclusion

Phacoemulsification technique of cataract surgery
is the standard procedure with judicious patient screening for proper and satisfactory visual outcome. EPT is more in conventional continuous mode than other modulations and other Phacoemulsification techniques. EPT is also more than Transverse and Torsional modulation.

**Financial Support** – Nil

**Conflict of Interest** – There is no conflict of Interest

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A Phenomenological Study to Assess the Lived Experience of Health Related Quality of Life of Diabetic Patient in Selected Hospitals of Pune City

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¹M.Sc Nursing Student, ²Assistant Professor, ³Director, Symbiosis College of Nursing, Symbiosis International (Deemed University), Pune

Abstract

Diabetes is the top health emergencies from the 21st century. Every year more people live with diabetes that could be a result of sedentary life and health related complication. First world health organization’s global report in (2016) about diabetes shows that the numbers of peoples with diabetes, almost from the year 1980 to 2014, has quadrupled. The number of peoples with diabetes has been increased from 108 million in 1980 to 422 million in 2014. The study aims to assess the Health related quality of life of diabetic patients. Phenomenological research design was used with Purposive sampling technique to select the participants. Sample size was 10 as determined by data saturation technique using a semi-structured questionnaire technique was adapted to collected data using colaizzi approach. The study finding revealed that in Baseline data 30% of the diabetic patients had age 25-35 years and 70% of them had age 35-45 years. 50% of them were females and 50% of them were male. 50% of them had higher secondary, 40% of them were illiterate and 10% of them had secondary education. 90% of them were married and 10% of them were unmarried and 30% of them had 5-10 years of working experience. 10% of them were non-vegetarians and 90% of them were vegetarians. All of them had family history of diabetes. 40% of their fathers having diabetes and 60 of their mothers had diabetes mellitus. And common themes were found like confusion, giddiness, restlessness and uncomfortable, effect of the medications as Anger, Anxiety, Frustration, Headache, Irritation, Nausea, Stress and Vomiting, ‘Confusion about the dose’, ‘Difficult to manage’, ‘Difficult to remember dose’, ‘Easy to manage’ and ‘Forget amount and dose of medication’. Joint pain, Tenderness, Tiredness Uncomfortable and Weakness.

Keywords: Diabetes Mellitus, Phenomenological Study.

Introduction

Diabetes was considered a disease of the wealthy in ancient India, and was known as Madhumeha (sweet urine disease); it was observed that ants were attracted to the urine. The ancient Greeks coined the term «diabetes», meaning excessive urination with dehydration, but neither they nor the Romans appreciated that the urine contained sugar; «diabetes» was considered a kidney disease until the 18th century. The sweet taste of the urine was known to Avicenna (1000 AD) and to Thomas Willis in the 17th century. The sweet taste was known to be due to glucose by the start of the 19th century, and raised glucose in the blood was recognized soon afterwards. The modern era was heralded by the discovery of Oskar Murkowski that removal of the pancreas resulted in diabetes, followed by the discovery of insulin in 1921-22. The herbalists of the middle Ages already knew the beneficial effects of the herb Galega officinalis, which ultimately led to the discovery of metformin. Likewise, Claude Bernard with his «pique diabetique» already suspected that the brain was somehow involved in the causation of diabetes, a topic that continues to attract research attention today. These examples show that many people have made the same observations and considered the same hypotheses at widely differing times, and that valuable finding are sometimes obscured by the fogs of time.

Diabetes Mellitus ("diabetes" for short) is a serious disease that occurs when your body has difficulty
properly regulating the amount of dissolved sugar (glucose) in your blood stream. It is unrelated to a similarly named disorder “Diabetes Insipidus” which involves kidney-related fluid retention problems. In order to understand diabetes, it is necessary to first understand the role glucose plays with regard to the body, and what can happen when regulation of glucose fails and blood sugar levels become dangerously low or high. The tissues and cells that make up the human body are living things, and require food to stay alive. The food cells eat is a type of sugar called glucose. Fixed in place as they are, the body’s cells are completely dependent on the blood stream in which they are bathed to bring glucose to them. Without access to adequate glucose, the body’s cells have nothing to fuel themselves with and soon die.

Human beings eat food, not glucose. Human foods get converted into glucose as a part of the normal digestion process. Once converted, glucose enters the blood stream, causing the level of dissolved glucose inside the blood to rise. The blood stream then carries the dissolved glucose to the various tissues and cells of the body. Though glucose may be available in the blood, nearby cells are not able to access that glucose without the aid of a chemical hormone called insulin. Insulin acts as a key to open the cells, allowing them to receive and utilize available glucose. Cells absorb glucose from the blood in the presence of insulin, and blood sugar levels drop as sugar leaves the blood and enters the cells. Insulin can be thought of as a bridge for glucose between the blood stream and cells.

Diabetes is common, affecting 23.6 million Americans according to a 2007 survey by the American Diabetes Association (CDC, 2008). Unfortunately that number is on the rise as roughly 1.6 million more Americans are diagnosed with diabetes every year (CDC, 2008). Diabetes comes in two major forms and a third less common form.

Type-1 Diabetes. The first major form of diabetes, known simply as Type 1 diabetes is an autoimmune disease wherein the body’s own immune system attacks and destroys the cells within the pancreas that produce insulin, rendering the affected person unable to produce insulin naturally. This type of diabetes was formerly known as Insulin Dependent Diabetes Mellitus, which is an inaccurate term because both major types of diabetes can require insulin treatment. Also known as juvenile diabetes, Type 1 diabetes often begins in childhood. It is fairly rare, accounting for only 5% or so of all diabetes cases. It would be a deadly disease except for the fact that insulin produced external to the body can be manually injected to substitute for what the body can no longer produce on its own. Persons with Type 1 diabetes must learn to periodically check their blood sugar and self-administer insulin shots in order to keep their blood sugar levels normalized. Though diet modifications cannot cure Type 1 diabetes, they are important to follow anyway so as to keep blood sugar swings minimized as much as possible.

Type 2 Diabetes. Type 2 diabetes is different than Type 1 diabetes in that it begins with a gradual decrease in the body’s ability to respond to insulin (a condition known as «Insulin Resistance»), rather than an abrupt stoppage of actual insulin production. Insulin resistance occurs when the body is repeatedly subjected to high levels of insulin in the blood stream. After a while the cells do not respond as vigorously to insulin as they once would. At this point it takes a higher level of insulin to get the same amount of glucose into the cells. This can be thought of a little like «the boy who cried wolf.» Initially, every time the boy cried out everyone came running quickly and efficiently. However, after running to the child multiple times and finding him completely safe the villagers stopped responding to his calls. Only after the disease has progressed does actual insulin production start to decrease. Though the mechanisms causing Type 1 and Type 2 diabetes are different, the net results are identical; blood glucose levels stay higher than normal and dangerous Hyperglycemia (high blood sugar) can result.

Hyperglycemia occurs when your blood glucose levels become too high, indicating the body’s inability to use the sugar that is present in the bloodstream. This occurs either because insulin is not available (Type 1 diabetes) or because the cells are resistant to the present insulin (Type 2 diabetes). Hyperglycemia is a sign that the body’s tissues are, to one degree or another, starving for glucose. In extreme and untreated cases, hyperglycemia can be very serious, leading to ketoacidosis, coma and even death.

Research Statement: A Phenomenological Study To Assess The Lived Experience Of Health Related Quality Of Life Of Diabetic Patient In Selected Hospitals Of Pune City.
Aims: 1. To assess the Health related quality of life of diabetic patients.

Methodology

- **Research approach:** Qualitative approach
- **Research design:** Phenomenological research design
- **Sampling technique:** Purposive sampling
- **Sample size:** 10 (as determined by data saturation technique)
- **Sampling criteria:**
  - **Inclusion criteria:**
    1. Who had developed diabetic mellitus (more than 2 years).
    2. Patient those who are available in that time
  - **Exclusion criteria:**
    1. Patients those who are not willing for Personal interaction

Data Collection Procedure: The data collection was done in 2 phases;

- **Section 1:** Includes Baseline Data Which Includes Age, Gender, Education Status, Marital Status, And Type Of Living Etc.
- **SECTION B-:** Includes Questions for In-Depth Interview.

Results

Section I: Baseline data:

Table 1: Description of samples (Diabetes Patients) based on their personal characteristics in terms of frequency and percentages

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Freq</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35 years</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>35-45 years</td>
<td>7</td>
<td>70%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.S</td>
<td>5</td>
<td>50%</td>
</tr>
</tbody>
</table>

• 30% of the diabetic patients had age 25-35 years and 70% of them had age 35-45 years.
• 50% of them were females and 50% of them were male.
• 50% of them had higher secondary, 40% of them were illiterate and 10% of them had secondary education.
• 90% of them were married and 10% of them were unmarried.
• 90% of them had joint family and 10% of them had nuclear family.
• All of them were Hindu.
• 80% of them had monthly family income more than Rs. 10000 and 20% of them had monthly family income Rs.10001-30000.
• 70% of them had less than 5 years of working experience and 30% of them had 5-10 years of working experience.
• 10% of them were non-vegetarians and 90% of them were vegetarians.
• All of them had family history of diabetes.
• 40% of their fathers having diabetes and 60% of their mothers had diabetes mellitus.

Section II

• Analysis of data related to Health Related quality of life of diabetic patients

• The diabetes patients when responding about the understanding of diabetes mellitus mainly mentioned the effect of DM and Reason of DM. While mentioning the effect of DM, they spoke about confusion, giddiness, restlessness and uncomforted. Whereas speaking about reasons of DM, they mentioned the reasons as blood sugar level rise issue and imbalance of insulin hormones.

• While responding on management of the daily dose of medication, they responded around two subthemes ‘Effect of medications’ and ‘Management of dose’. They mentioned the effect of the medications as Anger, Anxiety, Frustration, Headache, Irritation, Nausea, Stress and Vomiting. About management of daily dose they spoke around ‘Confusion about the dose’, ‘Difficult to manage’, ‘Difficult to remember dose’, ‘easy to manage’ and ‘Forget amount and dose of medication’

• While responding on Daily exercises they spoke around adverse effects and positive effects of daily exercise. They mentioned ‘Joint pain’, ‘Tenderness’, ‘Tiredness’, ‘Uncomfortable’ and ‘Weakness’ as the adverse effects of daily exercises if done excessively. They mentioned ‘Ability to work long time’, ‘Cure’, ‘Generate new energy’, ‘Healthy’ and ‘Perfect body shape’ as the benefits of daily exercises.

• On Management of dietary pattern their responses were around the subthemes ‘Feeling’, ‘Health related’ and ‘manage to follow’. Their feelings were Anger, Feeling very unlucky, Irritation, ‘not feeling good’. They had health related points ‘Cure’, ‘Keep healthy’ and ‘Proper homemade food’. To manage the dietary pattern, they ‘avoid parties’, few of them had problems like nausea and vomiting, it was difficult to follow, not feeling good and few of them think it is very hectic to follow the dietary pattern.

• They also spoke around management of Hypoglycemia at home with the subthemes ‘Diet related’, ‘Personal care’ and ‘Personal hygiene’. They mentioned ‘Proper healthy diet’, ‘Proper soft diet’ and few of them take some amount of sugar to manage Hypoglycemia. They mentioned daily dose of insulin injection, proper medication and proper rest for personal care. They also mentioned ‘Hand washing before and after food’, ‘Maintain personal hygiene’ and ‘Wash legs at bed time’ for personal hygiene.

• The responses on life style modifications required for managing diabetes were spread over three subthemes viz.,Encourage oneself, Exercise, Spirituality and Intake related. They encourage themselves to be a good human, better to themselves, they will cure and maintain good repo with others. They do morning walk, yoga and deep breathing exercises. They believe in god, pray to god and sing spiritual songs. They avoid bad habits like smoking, chewing tobacco. They take morning breakfast.

Conclusion

It deals with the introduction. Analysis and interpretation of the data collected for baseline data of diabetic patients and Analysis and interpretation of the data collected for interviewing of diabetic patients by semi-structured questionnaire.

Conflict of Interest: There is no conflict of interest in the present study.

Source of Funding: Self

Ethical Clearance: The present has cleared the Institutional Ethical Committee and informed & written consent was taken from the participation.
References


Oral Health Literacy among Students of an Engineering College in Puducherry

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Abstract

Background: Oral health literacy, plays an important role in the maintenance and promotion of oral health. However, there is limited data on Oral Health Literacy (OHL) among those not related to healthcare professionals.

Aim: To determine the OHL of students pursuing their graduation in technical stream (engineering) with secondary objective to determine its association with gender, perception of their oral health and oral health behaviour.

Methodology: A cross sectional questionnaire study was conducted among 236 students. A 17 item Oral Health Literacy – Adult Questionnaire (OHL-AQ) was distributed to determine their OHL scores. In addition, data on age, gender, brushing habits, visits to dentists, their self-rating of oral health and source of information was obtained. The data was analysed for mean differences using students ‘t’ tests with significance set at 0.05.

Results: More than 59 percent had inadequate oral health literacy. Overall mean score was 5.8 ± 2.7. More than 63 percent of study participants had not visited the dentist in the last 6 months and only 36 percent brushed their teeth twice a day. Majority rated their oral health as ‘good’. Those rating their oral health as ‘good’ had higher OHL-AQ scores (p<0.05). Gender, visits to dentist and brushing habits had no influence on OHL-AQ score (p>0.05). Internet was the commonly reported source of information.

Conclusion: OHL was found to be inadequate among the study participants. Oral health is an important concept that needs to be followed irrespective of educational background. Efforts needs to be directed towards those population with limited levels of Oral Health Literacy.

Keywords: Dentist, Health Literacy, Oral Health Literacy, Oral Health Behaviour, Tooth brushing

Introduction

Health literacy is defined as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate decisions”. The health benefits of improving health literacy are higher utilization of preventive services, lower rate of emergencies and hospitalization care, etc., resulting in lower health care...
expenditures, ability to know when and how to enter
the health care system, and how to make the best use of
health services.  

Oral Health Literacy (OHL) has been defined as
“The degree to which individuals have the capacity
to obtain, process, and understand basic oral health
information and service needed to make appropriate
health decisions and act on them.” OHL is interplay
between culture and society, the health system, education
system, and oral health outcomes indicating that it may
be a new determinant of oral health and should be
considered more intensively in oral health research. 3, 4
Most of the oral health care delivery systems are situated
in the urban areas, thereby leaving the rural population
disadvantaged. 5 Current evidence suggests that OHL
is associated with various factors like education level,
ethnic group, utilization of dental services, knowledge
regarding oral health and oral self-care behaviour 6-8

The simple concept of oral hygiene should be
understood equally by everyone irrespective of their
educational background. Lack of OHL can create
a significant barrier in preventing oral diseases and
promoting good oral health. For better understanding
and optimal utilization of oral health services by any
population group, it is important that we determine
their oral health literacy. The present study aimed to
determine the oral health literacy of students pursuing
their graduation in technical stream (engineering) with
a secondary objective to determine its association
with gender, perception of oral health and oral health
behaviour (brushing habits and visits made to dentist).

Methodology

Study setting and design

A Cross-sectional questionnaire study was
conducted in one conveniently selected engineering
college situated in Puducherry. Puducherry was a French
colonial settlement in India until 1954. It has a literacy
rate of about 86.5 percent 9 and is an educational centre
with medical, dental, engineering and other degree
colleges providing undergraduate and postgraduate
courses. The study was conducted in the month of June
2015. Permission to conduct the study was obtained
from the concerned authorities of Indira Gandhi Institute
of Dental Sciences (IGIDS), Puducherry. The study was
conducted in accordance with the Helsinki Declaration
of 1975, as revised in 2000. A letter of permission was
obtained from the Dean of IGIDS addressed to the Dean
of engineering college seeking permission to conduct
the study.

Participants

The permission was obtained from the Dean of
the engineering college and a specific day and time
was scheduled so as not to affect the daily academic
curriculum. A request was made not to reveal the
information about the study, day and time to the students.
On the pre-decided day and time, the investigator with
one faculty approached the students in lecture halls. The
nature of the study was explained to them. Participants
with a minimum age of 18 years, without any cognitive,
hearing or vision impairment, not having any difficulty
in understanding the questionnaire given by the principal
investigator and those providing informed consent were
included. Students not willing to be a part of the study
were given the autonomy to do so. They were also
assured of confidentiality and anonymity.

Study Sample and sampling

The sample size was calculated with a precision of
1.96 at 95% confidence level with an permissible alpha
error of 5% and prevalence of 19.1% (from previous
literature), the sample size for the present study was
found to be 236. Those students present on the day of
study (irrespective of their branches/streams and year of
study) and fulfilling the inclusion criteria were included
in the present study.

Measurement and Instrument

The instrument used in the present study was
developed and tested by Sistani et al in 2014. It is a valid
and reliable instrument with an internal consistency
of 0.72 and Intra-class correlation coefficient of 0.84. 10
The validity and reliability of this questionnaire has
been previously confirmed. 11 The questionnaire (OHL-
AQ) consists of 17 items in four sections: reading
comprehension, numeracy, listening and decision-
making. The reading comprehension section consisted
of six items with words omitted from one passage (three
uncompleted sentences) on oral health knowledge. The
numeracy section consists of four questions to assess
calculation skills related to mouthwash and antibiotics
prescription. The listening component has two questions
for assessment of communication skills. The decision-
making section contains five questions related to
common dental problems and items extracted from the medical history form. Correct answers were scored 1 and incorrect answers were scored 0. Sum of correct answers were then calculated to provide the total score for the questionnaire ranging from 0 to 17. It was categorized as inadequate literacy for scores 0 - 9, marginal literacy for scores 10 - 11 and adequate literacy for those scoring above 12.

Two additional item, a) “how do you rate your oral health at present?” and b) source of knowledge regarding oral health were separately elicited. Response for self-rating of oral health was recorded as ‘good’ or ‘poor’. The measure of ‘good’ was scored as 1 and ‘poor’ scored as 0 for analysis. Demographic variables like age, gender, brushing habits and visit to the dentist in the last 6 months were also elicited. The OHL-AQ was not tested for its reliability and validity in the present study setting.

The questionnaire was distributed to participants, which they had to read, listen comprehend and select the answers accordingly from the given options. Those questionnaires with more than one response for any item and incomplete questionnaires were excluded from analysis. The data was analysed for differences in OHL mean scores with respect to gender, their rating of oral health and oral health behaviours by student ‘t’ test using Statistical Package for Social Sciences version 16.0.0 (SPSS Inc., Chicago, IL, USA)

**Results**

A total of 200 questionnaires were subjected to analysis. The response rate was 84.7 (200/236) percent. The mean age of the study participants was 21.1 years with more males than females. The mean OHL-AQ score was 5.8 ± 2.7. Only one percent of the participants had adequate OHL, 39.5 percent had marginal, 59.5 percent had inadequate OHL. Thirty six percent brushed their teeth twice a day and 36.5 percent of the participants reported visiting a dentist in the last 6 months.

Majority of the participants rated their oral health as good. There was no statistically significant difference in OHL-AQ scores among gender, oral hygiene behaviour (visits to dentist and frequency of brushing teeth) [P>0.05], but significant differences were observed in mean scores of participants who rated their oral health as in a ‘good’ condition [P<0.05].

<table>
<thead>
<tr>
<th>Table 1: Distribution of participants according to variables (N=200)</th>
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</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Mean Age</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Males</td>
</tr>
<tr>
<td>Females</td>
</tr>
<tr>
<td>OHL-AQ scores</td>
</tr>
<tr>
<td>Adequate</td>
</tr>
<tr>
<td>Marginal</td>
</tr>
<tr>
<td>Inadequate</td>
</tr>
<tr>
<td>Mean Score (OHL-AQ)</td>
</tr>
<tr>
<td>Visited dentist (last 6 months)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Brushing Habit</td>
</tr>
<tr>
<td>Once a day</td>
</tr>
<tr>
<td>&gt;Once a day</td>
</tr>
<tr>
<td>Self-rating of Oral Health</td>
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<tr>
<td>Good</td>
</tr>
<tr>
<td>Poor</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Table 2: Source of knowledge for oral health (N=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources</td>
</tr>
<tr>
<td>Internet</td>
</tr>
<tr>
<td>Visit to dentist</td>
</tr>
<tr>
<td>Columns in newspaper</td>
</tr>
<tr>
<td>Articles in Magazines</td>
</tr>
<tr>
<td>Peers</td>
</tr>
</tbody>
</table>

Percentage (Frequency)
Table 3: Distribution of mean scores according to gender, oral health behaviours and self-rating of oral health

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean Score</th>
<th>Std. Dev</th>
<th>mean diff</th>
<th>df</th>
<th>t</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>males</td>
<td>4.99</td>
<td>2.827</td>
<td></td>
<td>198</td>
<td>1.5</td>
<td>0.114</td>
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<tr>
<td>females</td>
<td>5.64</td>
<td>2.923</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rating of Oral Health</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>good</td>
<td>5.49</td>
<td>2.84</td>
<td></td>
<td>198</td>
<td>2.8</td>
<td>0.005*</td>
</tr>
<tr>
<td>poor</td>
<td>3.75</td>
<td>2.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit to the dentist (last 6 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>did not visit</td>
<td>5.34</td>
<td>2.9</td>
<td>0.090</td>
<td>198</td>
<td>0.231</td>
<td>0.83</td>
</tr>
<tr>
<td>visited</td>
<td>5.25</td>
<td>2.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushing Habits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>once a day</td>
<td>5.28</td>
<td>2.7</td>
<td>0.010</td>
<td>198</td>
<td>0.024</td>
<td>0.98</td>
</tr>
<tr>
<td>&gt;once a day</td>
<td>5.29</td>
<td>3.1</td>
<td></td>
<td></td>
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</tbody>
</table>

*significance level at p<0.05; mean diff: Mean Difference

Discussion

Oral health is an integral part of general health. To our knowledge, there is limited literature to assess the oral health literacy using OHL-AQ, with the same study parameters. The mean OHL-AQ scores in the present study was 5.8 (3.1 – 7.8). Studies conducted using the same instrument among different target population have documented higher scores. 6, 12 This implies the assumption of poor oral health status among study participants since low OHL can be a predictor for poor self-reported/oral health status. 6, 8, 10 However, OHL-AQ scores revealed about 59 percent of study participants had inadequate OHL. This may limit their ability to process and understand basic oral health information. In addition, literature points out that limited OHL has proved to be a barrier in utilization of dental services and dental visits. 13, 14

Various instruments have been used in the past to assess OHL. 15–17 For the present study we, opted for Oral Health Literacy – Adult Questionnaire (OHL-AQ). In addition to reading comprehension and numeracy, OHL-AQ is reinforced with listening and decision making domain producing a more stable and comprehensive score which mimics the probable applicability by the study participants. Our study showed that OHL scores had no significant association with gender (P>0.05). Similar results were also observed among students in Iran and adults in India respectively. 12, 18 Though insignificant, in the present study it was observed that females scored higher than males, indicating that females are more receptive to instructions for better oral health.

Oral health behavior is fundamental to the maintenance of oral health; therefore, brushing teeth and visits to dentist was considered for comparison with mean OHL-AQ scores. There was no significant difference between mean OHL-AQ scores with visits to dentist and brushing habits (P>0.05). Such insignificant associations were also observed among American adults. 17, 19 Perhaps overall lower mean scores is a contributing factor highlighting inadequate dental knowledge of study participants. This indicates the need for incorporation of guest lectures, seminars on oral health topics as a part of their extracurricular activities.
in their educational curricula.

The findings in the present study also confirm that majority of the study participants had not been to a dentist in the last 6 months and brushed their teeth only once a day. Though utilization of oral services is subjective, brushing teeth and regular visit to dentist is a step towards preventive measures. The insignificance mentioned above is justified since, by not visiting a dentist the likelihood of study participants receiving proper oral hygiene instructions is reduced thereby prompting to search for other avenues. Perhaps it might have its origin in their childhood. One effective way to promote this behaviour is school based dental care, where children visit a dentist for check-ups at regular intervals which may continue in adulthood. Tooth brushing is a healthy behaviour, which indicates a person’s attitude to oral health. It is also proved that higher OHL scores relate to more frequent tooth brushing.

In the present study we observed significant differences between OHL-AQ scores and oral health status \( (P<0.05) \) among study participants which is in agreement with studies conducted in Iran and Australia respectively. However, the present assessment was subjective (self-reported by students); requiring further scientific evidence to confirm this finding and to validate the accuracy of self-reports by students. We also wanted to know the source of information these study participants referred for relevant oral health knowledge. Forty five percent of these often browsed the internet to obtain or confirm their doubts related to oral health. This was followed by information related to oral health in newspapers. One effective method to improve OHL is to increase the rendezvous of students, adults and general population with oral health messages printed on daily life utilities. Informative, short yet impactful messages on coffee mugs, fountain pens, key chains, water bottles, lunch boxes and pencil boxes are innovative methods which may help in the long run. Perhaps further research can be directed towards this unexplored domain to prove/disapprove the hypothesis.

**Conclusion**

From the present study it can be concluded that OHL was found to be inadequate among the study participants. OHL scores were not associated with gender, visits to dentist and brushing habits. There is a need to make constant efforts to improve OHL so that people do adopt practices that have been scientifically shown to be effective in maintaining oral health which otherwise could result in higher prevalence’s of oral diseases.

**Conflict of Interest:** None

**Source of Funding:** Self-funded

**Ethical Clearance:** Obtained, Institutional Committee of Indira Gandhi Institute of Dental Sciences, Puducherry.

**References**


Infertility its Socio-demographic Correlates and Causes in Rural and Urban areas of Allahabad District

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Abstract

Introduction: Childbearing is an extremely important event in every human’s life and is strongly associated with the ultimate goals of completeness and family integration. Infertility can threaten a woman’s identity, status and economic security and consequently, be a major source of anxiety leading to lowered self-esteem. Infertile couples have high negative feelings and poor social support.¹

The present study was done with the following objectives: 1. To study the socio demographic profile of eligible couple in study population. 2. Find out the various medical factors associated with infertility.

Material & Method: The present study was a cross sectional descriptive study was conducted on eligible couples of urban and rural areas of Allahabad district. Data was collected by a structured questionnaire designed for the purpose.

Result & Conclusion: A total of 422 couples were studied from urban and rural areas each. Majority of the couples in both rural and urban areas belonged to 26-35yrs of age. Association between infertility and education of females, and their occupation were statistically significant. In urban area most common cause of infertility was semen abnormality followed by PCOD, in rural area PID and STIs/RTIs, followed by tubal factors and semen factors.

Keywords: Infertility, Rural, Urban, and medical causes of infertility.

Introduction

Childbearing is an extremely important event in every human’s life and is strongly associated with the ultimate goals of completeness and family integration. The consequences of infertility are manifold and can include societal repercussions and personal suffering. Childless women experience stigma and isolation. Infertility can threaten a woman’s identity, status and economic security and consequently, be a major source of anxiety leading to lowered self-esteem. Infertile couples have high negative feelings and poor social support.¹

Consequences of infertility for couples in developing countries (like India), where children are highly valued for economic and socio cultural as well as personal reason are great. Infertility is a global health issue, affecting approximately 8-10% of couples worldwide.²

Etiology of infertility varies from region to region and from one population to another. The biological and social factors including stress due to economic status, religious attitudes, age at marriage, urbanization leading to modernization, higher literacy, contraceptive usage and nuclear families play a significant role in lowering fertility.³ For a large part, infertility is related to conditions that are preventable in principle such as STIs, infections and parasitic diseases, health care practices leading to iatrogenic pathology, exposure to toxic substances either in the diet or environment and complications suffered during post partum or post abortion period, particularly in case of an unsafely induced abortion.⁴
STIs are generally considered the leading preventable cause of infertility worldwide, especially in developing countries. Other causes of female infertility include tubal blockage, PID caused by infections like TB, advanced maternal age, uterine problems, endometriosis, hormonal problems, etc. Male infertility is most commonly due to deficiencies in the semen, and semen quality is used as a surrogate measure of male fecundity.

The Ninth Five-Year Plan (1997–2002) document of Government of India included infertility in the comprehensive reproductive and child health package. Services for infertility and RTI are available only at district and sub district hospitals and some community health centres.

The present study was done with the following objectives:

1. To study the socio demographic profile of eligible couple in study population.
2. Find out the various medical factors associated with infertility.

Material and Method

This cross sectional study was conducted among the eligible couples (wherein the wife was in the age group of 15-45 years) of Allahabad district during the period of one year. Statistically valid sample size was drawn, based on reported P= 4% (prevalence of infertility according to NFHS 3 Survey)

\[ L = \frac{P}{2} = 2 \]

\[ 4PQ/L*2 = 422 \] (adding non-response rate of 10%)

422 subjects were taken from rural and urban area each. Therefore the sample size was 844.

Sampling Technique: Multistage random Sampling was used to reach the required sample size. In the first stage, Allahabad district was divided into four quadrants and various blocks & wards were listed. Subsequently, one block and one ward was selected randomly from each quadrant followed by listing of all the villages of the selected blocks and wards of the selected colonies. Then 1 colony per ward & 1 village per block were randomly selected. Finally the households of colonies and villages were visited and eligible couples were interviewed. House to house visits were done in the selected villages and colonies and eligible couples were identified for collection of data. Study subjects were explained in detail about the purpose and objective of the study. Informed consent was obtained & they were ensured that all information would be kept confidential.

Among the couples those who were exposed to the risk of pregnancy were considered and couples with inability to conceive despite cohabitation and exposure to the risk of pregnancy (in the absence of contraception) for two years or more (as per WHO Epidemiological definition) were included in the study. Detailed information was collected on a predesigned and pretested questionnaire Data regarding medical conditions associated with infertility was also collected based on the investigation reports that were available with the couples at the time of survey. Data was collected and entered into data sheet of the Statistical Package for the Social Sciences (SPSS) version 21. Data was analysed and statistically evaluated by using chi square test.

Results

Socio demographic profile of study couples

Table 1 shows the distribution of study couples in urban and rural areas on the basis of their age. A total of 422 couples were studied from urban and rural areas each. It can be seen that majority of females in both the areas, 244 (57.82%) in urban area and 229 (54.27%) in rural areas belonged to the age group of 26-35 years. Similarly, majority of male partners in both the areas, 207 (49.05%) in urban area and 232 (54.98%) in rural areas belonged to the age group of 26-35 years.

It also shows that out of the 422 females in urban areas 75 (17.77 %) were illiterate. A total of 32 (7.58%) females were Graduates and only 15 (3.55%) were post graduates. A total of 49 (11.61%) males were illiterate in the urban areas. Only 30 (7.11%) were post graduates.

In rural areas, most of the females i.e. 184 (43.60%) were illiterate. A total of 32 (7.58%) females were Graduates and only 15 (3.55%) were post graduates. A total of 49 (11.61%) males were illiterate in the urban areas. Only 30 (7.11%) were post graduates.

In rural areas, most of the females i.e. 184 (43.60%) were illiterate. Very few i.e. 3 (0.71%) were Graduate. Among the males 89 (21.09%) were illiterate. There were only 11 (2.61%) graduates and 3 (0.71%) were post graduates.

Table 1 also shows the occupation of females and their male partners in both urban and rural areas. It can be seen that majority of females in both the areas, 347 (82.23 %) in urban areas and 359 (85.07%) in rural areas
were housewives. A total of 7 (1.66%) females were professions but none of them in rural areas. In males 172 (40.76%) were engaged in private job followed by 77 (18.25%) labourers, 46 (10.90%) shopkeepers. Out of the total 422 male partners in urban areas, 23 (5.45%) were unemployed. In rural areas majority of the male partners 151 (35.78%) were labourers, followed by 126 (29.85%) who were engaged in agriculture, 9 (2.13%) of them were Professionals, few were teacher.

Distribution of study couples according to their religion can be observed from table 2. It can be seen that in urban areas most of the couples, 343 (81.28%), belonged to the religion of Hinduism followed by those belonging to Islam i.e. 75 (17.77%) couples and only 4 (0.95%) couples belonged to Christianity. Similarly in rural areas the most common religion was Hinduism with 373 (88.39%) couples which was more as compared to that in urban areas. This shows significant association between the religion of study couple (p<0.05).

Table 3 depict the socioeconomic status of the couples in rural and urban areas. Maximum number of couples in both the areas, 154 (36.49%) in urban areas and 173 (40.99%) in rural areas belonged to Upper Lower Class. This association was statistically significant (p<0.05).

Table 4 depict the fertility status of the couples on the basis of their residence. Out of the total 422 couples in the urban areas 50 (11.84%) couples were infertile and a total of 22 (5.21%) couples were infertile in the rural area. Thus it can be seen that the prevalence of infertility in urban area is 11.84% and in rural area it is 5.21%. This implies that is there is significant association between fertility status of the couple and residence of study couple (p<0.05).

Medical factors associated with infertility
Table 5 depict the different medical causes of infertility in the study couples. It can be observed that in urban areas the most common cause of infertility was semen abnormality 13(28.26%) and in rural areas PID and other STIs/RTIs were found to be the most common cause 7(35.00%). Infertility remained unexplained in 17.39% and 10% of the infertile couples in urban and rural areas respectively.

Discussion: In the present study it was found that maximum proportion (10.15%) of infertility was found among the females who belonged to the age group of 26-35 years and minimum proportion of infertility (3.25%) was found among females in the age group of 15-25 years. Maximum proportion (9.57%) of infertility was found among the male partners who belonged to the age group of 26-35 years and minimum proportion of infertility (3.66%) was found among the male partners in the age group of 15-25 years. Similar findings by S. Shamila et al9 (2011) reported that maximum infertility of females visiting infertility clinics prevailed between 25-30 years of age, with 43.80%, 47.95% and 36.26% in Kanyakumari, Thirunelveli and Thiruvananthapuram, respectively. Izatulla Jumayev et al10 (2012) also found that maximum females with infertility ranged between 19 - 35 (mean age 25.8 years).

Regarding the education status of infertile couples in the present study, maximum (26.67%) proportion of infertility was found among those females who were educated upto post graduate level and the association between infertility and education status of females was found to be statistically significant. This could be because delaying marriage and childbirth may be more common among the females who go for higher education. Among the male partners also maximum (12.12%) proportion of infertility was found among those were educated upto post graduate level and no association was found between the education status of male partners and infertility. Similar results were reported by S. Shamila et al11 (2011). It was observed that educational status was the most important variable; women with secondary school education and above had markedly lower average fertility (P < 0.01) than the less educated. Ajeet Vasant Saoji (2014)12 in a case-control study in Nagpur reported that approximately 52.7% of primary infertility cases received educations of Graduation and above compared to 47.2 % of the control and an estimated OR of 2.2,(95% CI 1.02-4.82).

In the present study it was found that infertility was highest (28.57%) among the females who were doing professional jobs (Doctor, Engineer and lawyers) minimum proportion (6.80%) of infertility was seen among the housewives. The association between infertility and occupation was found to be statistically significant. Regarding the occupation of male partners, it was observed that maximum proportion (14.71%) of infertility was seen in couples where the male partners were doing business. No association was found between infertility and occupation of male partners. Similar
findings were reported by Mokhtar S et al\textsuperscript{13} (2006) who conducted a case control study and observed that about 57.6% of cases and 68% of controls were housewives, with significant association of being infertile.

In the present study, it was observed that more proportion (9.36%) of infertility was found in couples following Hinduism as compared to those following Islam (4.03%). Similar to our findings were the results reported by Paul C. Adamson et al\textsuperscript{14} (2011) who studied the prevalence and correlates of infertility among young females of Mysore and reported that over half of the study participants reported their religion as Hindu (60.1%).

In the present study maximum proportion of infertility was seen among couples belonging to Upper (16.67%) and Upper Middle class (16.95%), minimum proportion of infertility was seen among those belonging to Upper Lower class (6.73%), and the association between infertility and socioeconomic status of couples was found to be statistically significant. This may be because females belonging to affluent classes tend to delay their marriage and childbirth and are also mostly obese and all these factors cumulatively affect fertility. Similar to the findings of our study, Sameer Valsangkar et al\textsuperscript{15} (2011) also found that a higher socio-economic status was significant for outcome of infertility.

In the present study, the most common cause of infertility in urban areas was semen factors (28.26%) followed by PCOD (23.91%). Other common causes were PID and other STIs/RTIs 7(15.22%), tubal factors (13.04%), endometriosis (8.70%), and hypothyroidism (10.87%). In rural areas commonest cause of infertility was PID and other STIS/RTIS (35.00%) followed by semen factors and tubal factors (20.00% each). Similarly, Jehoshua Dor et al\textsuperscript{16} (1977) did an evaluation of etiologic factors in infertile couples of Israel and found that male infertility factors were involved in 28%, ovulatory disturbances in 31.5%, tubal factors in 16.3%, and undiscovered factors in 17.6%.

### Table 1: Distribution according to Age, Education and Occupation of study couples

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Age Group (in years)</th>
<th>Urban (n=422)</th>
<th>Rural (n=422)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females</td>
<td>Male partners</td>
<td>Females</td>
</tr>
<tr>
<td>1</td>
<td>15-25</td>
<td>60</td>
<td>14.21</td>
</tr>
<tr>
<td>2</td>
<td>26-35</td>
<td>244</td>
<td>57.82</td>
</tr>
<tr>
<td>3</td>
<td>36-45</td>
<td>118</td>
<td>27.96</td>
</tr>
<tr>
<td>4</td>
<td>46-55</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Education Status

| 1      | Illiterate | 75 | 17.77 | 49 | 11.61 | 184 | 43.60 | 89 | 21.09 |
| 2      | Primary | 65 | 15.40 | 48 | 11.37 | 146 | 34.60 | 105 | 24.88 |
| 3      | Secondary | 85 | 20.14 | 59 | 13.98 | 64 | 15.17 | 91 | 21.56 |
| 4      | High School | 70 | 16.59 | 88 | 20.85 | 17 | 4.03 | 82 | 19.43 |
| 5      | Intermediate | 80 | 18.96 | 100 | 23.70 | 8 | 1.90 | 41 | 9.71 |
| 6      | Graduation | 32 | 7.58 | 48 | 11.37 | 3 | 0.71 | 11 | 2.61 |
| 7      | PG | 15 | 3.55 | 30 | 7.11 | 0 | 0.00 | 3 | 0.71 |
Table 1: Distribution according to Age, Education and Occupation of study couples

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Study Couples</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban (n=422)</td>
<td>Rural (n=422)</td>
</tr>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------</td>
<td>---------</td>
</tr>
<tr>
<td>1 Unemployed/Housewife</td>
<td>347 82.23</td>
<td>359 85.07</td>
</tr>
<tr>
<td>2 Labourer</td>
<td>12 2.84</td>
<td>23 5.45</td>
</tr>
<tr>
<td>3 Agriculture</td>
<td>0 0.00</td>
<td>0 0.00</td>
</tr>
<tr>
<td>4 Shopkeeper</td>
<td>8 1.90</td>
<td>12 2.84</td>
</tr>
<tr>
<td>5 Private job</td>
<td>36 8.53</td>
<td>40 9.26</td>
</tr>
<tr>
<td>6 Clerk</td>
<td>0 0.00</td>
<td>0 0.00</td>
</tr>
<tr>
<td>7 Business</td>
<td>0 0.00</td>
<td>0 0.00</td>
</tr>
<tr>
<td>8 Teacher</td>
<td>12 2.84</td>
<td>14 3.31</td>
</tr>
<tr>
<td>9 Professional (Doctors, Engineers, Lawyers)</td>
<td>7 1.66</td>
<td>0 0.00</td>
</tr>
</tbody>
</table>

Table 2: Distribution of study couples according to their religion

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Religion</th>
<th>Study Couples</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urban (n=422)</td>
<td>Rural (n=422)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>1</td>
<td>Hinduism</td>
<td>343 81.28</td>
<td>373 88.39</td>
</tr>
<tr>
<td>2</td>
<td>Islam</td>
<td>75 17.77</td>
<td>49 11.61</td>
</tr>
<tr>
<td>3</td>
<td>Christianity</td>
<td>4 0.95</td>
<td>0 0.00</td>
</tr>
</tbody>
</table>

Table 3: Distribution of study couples according to the Socio economic status

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Socioeconomic Status*</th>
<th>Study Couples</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urban (n=422)</td>
<td>Rural (n=422)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>1</td>
<td>Upper Class (I)</td>
<td>40 9.48</td>
<td>8 1.89</td>
</tr>
<tr>
<td>2</td>
<td>Upper Middle Class (II)</td>
<td>44 10.42</td>
<td>14 3.31</td>
</tr>
<tr>
<td>3</td>
<td>Lower Middle Class (III)</td>
<td>134 31.75</td>
<td>123 29.15</td>
</tr>
<tr>
<td>4</td>
<td>Upper Lower Class (IV)</td>
<td>154 36.49</td>
<td>173 40.99</td>
</tr>
<tr>
<td>5</td>
<td>Lower Class (V)</td>
<td>50 11.85</td>
<td>104 24.64</td>
</tr>
</tbody>
</table>

*P.Kumar’s Modification of B.G. Prasad’s Socio Economic Classification Corrected to Current All India Consumer Price Index (AICPI- May 2014):
Table 4: Fertility status of the study couples according to their area of residence

<table>
<thead>
<tr>
<th>Fertility Status</th>
<th>Urban area (n=422)</th>
<th>Rural area (n=422)</th>
<th>Total</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Infertile</td>
<td>50</td>
<td>11.85</td>
<td>22</td>
<td>5.21</td>
</tr>
<tr>
<td>Fertile</td>
<td>372</td>
<td>88.15</td>
<td>400</td>
<td>94.78</td>
</tr>
</tbody>
</table>

Table 5: Medical causes of infertility among the study couples

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Causes</th>
<th>Urban area</th>
<th>Rural area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>1</td>
<td>Semen factor</td>
<td>13</td>
<td>28.26</td>
</tr>
<tr>
<td>2</td>
<td>PCOD</td>
<td>11</td>
<td>23.91</td>
</tr>
<tr>
<td>3</td>
<td>PID &amp;other STIs/RTIs</td>
<td>7</td>
<td>15.22</td>
</tr>
<tr>
<td>4</td>
<td>Genital T.B.</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>Tubal factors</td>
<td>6</td>
<td>13.04</td>
</tr>
<tr>
<td>6</td>
<td>Endometriosis</td>
<td>4</td>
<td>8.70</td>
</tr>
<tr>
<td>7</td>
<td>Hypothyroidism</td>
<td>5</td>
<td>10.87</td>
</tr>
<tr>
<td>8</td>
<td>Ca Cervix</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td>Unexplained</td>
<td>8</td>
<td>17.39</td>
</tr>
</tbody>
</table>

Conclusion

The present study was conducted on eligible couples of rural and urban areas of Allahabad district. Majority of females in both the urban (57.82%) and rural (54.27%) areas, belonged to the age group of 26-35 years, similar findings were there in their male partners. Most of them were Hindus. Majority of females in urban areas were educated up to Secondary level and only 17.77% females were illiterate. In urban 11.61% males were illiterate. In rural areas, majority of male partners (24.88%) attained education up to Primary level and 21.09% were illiterate. Regarding the occupation of females, it was found that in both urban and rural areas majority were housewives. Maximum couples in both the areas, 36.49% in urban areas and 40.99% in rural areas belonged to Upper Lower Class. In urban area the most common cause of infertility was semen abnormalities (28.26%) followed by PCOD (23.91%). The cause remained unexplained in 17.39% cases. Other causes were PIDs and other STIs/RTIs (15.22%), tubal factors (13.04%), hypothyroidism (10.87%) and endometriosis (8.70%) etc. The cause of infertility in rural area was mostly PID and STIs/RTIs (35.00%), followed by tubal factors and semen factors (20.00% each) and genital Tuberculosis (15.00%).

Recommendation: Awareness about the potential risks for infertility should be spread through health education in the community. In urban areas life style modification can also work. In rural areas infection prevention can reduce the burden of infertility. Non-Government Organizations should also assist in conducting training workshops for the health care providers.

Acknowledgement: The authors wish to thank Ms Neha Mishra for her help in making tables and statistical help.

Conflict of Interest: Authors have no conflict of interest. For the study ethical clearance was obtained from institutional review committee.
Source of Funding: None

References


8. National, regional and global trends in infertility: a systematic analysis of 277 health surveys


Evaluating the Efficacy of Myeloperoxidase and other Biochemical Parameters in the Diagnosis of Chronic Kidney Disease among Diabetic Patients: A Cross-sectional Study

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Abstract

Introduction: Chronic kidney disease (CKD) is a public health problem across the globe which is characterized by the accumulation of various substances like urea, creatinine, electrolytes, water, in the human body. CKD patients are more prone to increased risk of developing oxidative stress due to metabolic disorders, immunodeficiency and persistent infections and inflammation. Myeloperoxidase may participate as one of the mediators of oxidative modification of biomolecules/tissues and contribute to the development of co-morbidities and complications in patients with CKD.

Aims and objectives: The present study was undertaken to assess the role of Myeloperoxidase, HbA1c, Urea, Creatinine urine microalbumin and eGFR in chronic kidney disease in diabetic and non diabetic patients.

Materials and Method: A cross sectional study consisting of two groups with 50 participants each was carried out. Group-I included 50 Chronic kidney disease patients without Diabetes mellitus (CKD-ND) & Group-II included 50 patients of Chronic kidney disease with Diabetes mellitus (CKD-DM). Myeloperoxidase, HbA1c, Urea, Creatinine and urine microalbumin were estimated in the blood and urine samples by using Erba & ELISA kits on XL-640 clinical chemistry analyzer and ELISA reader.

Results: The values of Myeloperoxidase were statistically decreased in diabetic patients with chronic kidney disease (Group-II) when compared with Non diabetic patients with chronic kidney disease (Group-I). Myeloperoxidase levels were compared with Urea, Creatinine, Microalbumin and eGFR levels. eGFR levels showed a significant negative correlation with MPO levels.

Conclusion: The present study showed that decreased serum MPO can be used as an indicator for chronic kidney disease in diabetic patients which can prevent further complications. MPO levels decline steadily as CKD progresses, which might be due to the inhibitory effect of uraemic toxins on the enzyme.

Keywords: Myeloperoxidase, Chronic Kidney Disease, Diabetes mellitus, Estimated glomerular filtration rate (eGFR), urine Microalbumin.

Introduction

CKD is a slow and progressive disorder of kidney dysfunction which is reported worldwide affecting 750 million people globally [¹]. In India, diabetes and hypertension account for 40–60% cases of CKD [²]. Chronic kidney disease (CKD) is a global threat to
health in general and for developing countries like India, because of the dietary habits, socio economic status and life style.

CKD patients are at higher risk related to oxidative stress, metabolic disorders and other pathologies. Hence CKD is a major cause of morbidity and mortality due to lack of proper diagnosis and treatment. The mammalian heme peroxidase enzymes play a major role in human immune abnormalities. Heme peroxidases are the acceptors which utilize $H_2O_2$ to catalyze oxidative reactions. MPO is an oxidizing agent whose elevated levels have been associated with CAD, atherosclerotic lesions. Hence this study is first of its kind to correlate the association between MPO levels in CKD with and without diabetes.

MPO is produced by neutrophilic granulocytes which along with heme (as co-factors) is microbicidal/bactericidal by producing HOCl, $H_2O_2$ and Cl anions. MPO is a basic arginine rich glycosylated protein (isoelectric point $>10$) \cite{3} which is comprised of two subunits, encoded within a single mRNA molecule. Studies also revealed that apart from being bactericidal its major role also has been associated with non-microbial inflammatory process and neuro degenerative diseases. There are studies which correlate MPO as enzymatic source of bioactive lipids and other products which have emphasized that they adversely affect the cardio protective capacity of high density lipoproteins and as well induce endothelial dysfunction \cite{4,5}. This study is an attempt to understand the role of MPO as a predictor for early detection of CKD in diabetic patients. Hence a cross-sectional study was carried out among CKD patients with and without diabetes. The following are the objectives:

1). Correlation of MPO levels with eGFR
2). Correlation of MPO levels with Microalbumin

**Materials and Method**

A cross sectional study was conducted in the department of Biochemistry in collaboration with Medicine and Nephrology, at central laboratory of Prathima Institute of Medical Sciences during the period of June 2015 to September 2016. Two comparative groups consisting of 50 study participants each were enrolled in the study. The study was approved by the ethical committee of the institute (IEC/PIMS: 2015/01).

Age and sex matched healthy controls were enrolled from the allied hospital. Informed consent was obtained from all the participants in the study. Clinical history and demographic details of the patients were collected using structured questionnaire. In each group, subjects were selected by simple random sampling technique. The groups were divided as follows:

- **Group-I** 50 CKD without Diabetes (CKD-ND)
- **Group-II** 50 CKD with Diabetes (CKD-DM)

**Inclusion criteria:**

- Age $\geq$ 40 years, and $\leq$ 70 years
- Clinically Confirmed diabetic patients with duration of diabetes $>5$ years and $<10$ years
- Clinically confirmed patients of CKD

**Exclusion criteria:**

- Not willing to consent,
- Duration of diabetes $<5$ years and $>10$ years

Under aseptic conditions, 5ml random venous blood sample was collected from each participant by anti cubital vein puncture in a disposable syringe of which 2 ml was collected into a EDTA vaccutainer for the estimation of HbA1c and the remaining was transferred into a plain bulb. After centrifugation serum was separated and used for the estimation of biochemical parameters like Urea, Creatinine and Myeloperoxidase. A random urine sample of 5 ml was collected in a sterile container for the estimation of Microalbumin. Myeloperoxidase was estimated by ELISA method. Urea and Creatinine were estimated in serum sample and Microalbumin was estimated in the urine sample collected from the above subjects on XL-640 fully automated analyser. eGFR was calculated using CKD-EPI formula.

Serum Urea is estimated by Berthelot method.\cite{6}

GFR is calculated by using CKD-EPI creatinine equation 2009.

$$GFR = 141 \times \min(S_{cr}/\kappa, 1)^{\alpha} \times \max(S_{cr}/\kappa, 1)^{-1.209} \times 0.993^{\text{Age}} \times 1.018 \times 1.159 \times 0.857 \times \text{[if female]} \times 1.135 \times \text{[if black]} \times \text{[if female]} \times 1.018 \times 1.159 \times 0.857 \times \text{[if female]} \times 1.135 \times \text{[if black]}.\cite{7}$$

Glycosylated haemoglobin is a boronate affinity which was estimated by immuno chromatographic method using Nycocard reader.
Creatinine was estimated by Jaffe’s Method. Microalbumin is estimated by pyrogallol red method. Myeloperoxidase is estimated by standard protocol using ELISA technique.

**Statistical analysis:** The results were expressed as Mean±SD and student’s t-test was done to compare the mean parameters. Correlation analysis were done using Karl Pearson’s correlation coefficient. Statistical significance was considered at the level of 5% (p-value < 0.05). Statistical analysis was performed by SPSS version 20.

**Results**

The results of two groups were expressed as Mean±SD. Table 1 shows the comparison of Group-I (CKD-ND) with Group-II (CKD-DM). It summarizes the Mean±SD of Serum Myeloperoxidase, Serum Creatinine, Urea, HbA1c, Urine microalbumin and eGFR. The Myeloperoxidase levels of Group-II were (7.59±3.71) which is significantly lower as compared to in Group-I (10.41±4.75). The eGFR levels were significantly decreased in Group-I (15.40±12.21) compared to Group-II (19.14±13.51) respectively. Microalbumin levels were higher in Group-II (138.78±90.47) when compared to Group-I (71.94±64.26). The Creatinine levels of Group-I were (6.24±4.13) as compared to (4.78±2.77) in Group-II. The values of HbA1c in Group-II (7.69±1.17) were higher when compared to Group-I (5.34±0.49). The results also reveals that the values of serum Myeloperoxidase were significantly decreased in Group-II when compared to Group-I. ‘p’ value(<0.001) was found statistically significant for Myeloperoxidase and Creatinine in Group-II.

**Table 1: Comparison of CKD-ND and CKD-DM**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group-I (CKD-ND) n=50</th>
<th>Group-II (CKD-DM) n=50</th>
<th>‘p’- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPO ng/ml</td>
<td>10.41±4.75 (4.7-22.5)</td>
<td>7.59±3.71 (4.3-19.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>eGFR (ml/min/1.732 m²)</td>
<td>15.40±12.21 (03-49)</td>
<td>19.14±13.51 (03-47)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Microalbumin mg/L</td>
<td>71.94±64.26 (11.6-256.1)</td>
<td>138.78±90.47 (23-400)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Creatinine(mg/dl)</td>
<td>6.24±4.13 (1.5-21.4)</td>
<td>4.78±2.77 (1.5-13.3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Urea(mg/dl)</td>
<td>84.86±40.76 (32-212)</td>
<td>81.08±41.79 (21-169)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HbA1c%</td>
<td>5.34±0.49 (4.3-6.1)</td>
<td>7.69±1.17 (6.4-11.2)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Correlation studies revealed a negative correlation between Myeloperoxidase and eGFR in Group-I (CKD-ND) and a positive correlation in Group-II (CKD-DM). The correlation co-efficient value ‘r’ was -0.005 and ‘p’ value was 0.972 for Group-I (CKD-ND). The value of ‘r’ was 0.114 and ‘p’ value was 0.431 in Group-II (CKD-DM). This indicates that there was a significant positive correlation between Myeloperoxidase and eGFR in Group-II when compared with Group-I. The reason for non significant correlation may be due to non linearity and small sample size.
Table 2: Correlation between eGFR, Myeloperoxidase and Microalbumin

<table>
<thead>
<tr>
<th>Groups</th>
<th>Correlation Coefficient</th>
<th>r</th>
<th>'p' value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Diabetic</td>
<td>eGFR &amp; MPO</td>
<td>-0.005</td>
<td>0.972</td>
</tr>
<tr>
<td></td>
<td>eGFR &amp; Microalbumin</td>
<td>-0.348</td>
<td>0.013*</td>
</tr>
<tr>
<td></td>
<td>MPO &amp; Microalbumin</td>
<td>-0.136</td>
<td>0.345</td>
</tr>
<tr>
<td>Diabetic</td>
<td>eGFR &amp; MPO</td>
<td>0.114</td>
<td>0.431</td>
</tr>
<tr>
<td></td>
<td>eGFR &amp; Microalbumin</td>
<td>-0.401</td>
<td>0.003*</td>
</tr>
<tr>
<td></td>
<td>MPO &amp; Microalbumin</td>
<td>-0.274</td>
<td>0.054</td>
</tr>
</tbody>
</table>

Note:*significant with 5% level of significance

Discussion

Proteinuria is the common indication for end stage renal diseases (ESRD) which is more commonly seen in patients with CKD. It might contribute to the complications associated with the progression of the disease. It also influences the mortality in CKD patients. HOCl and MPO derived oxidants induces damage to the renal tissue there by contributing to the renal complications [11]. Lipid peroxidation is induced
by extracellular MPO which is capable of catalyzing lipoprotein peroxidation in vivo, thus resulting in atherosclerosis which is common in CKD patients. Due to its cationic character it can bind to the negatively charged structures of endothelial cells and albumin.[12].

In this study, we aimed at evaluating the levels of Myeloperoxidase, Microalbumin and calculation of eGFR using CKD-EPI equation in diabetic and non diabetic patients. There was a significant decrease in MPO levels, and an increase in microalbumin levels in Diabetics with CKD when compared with non diabetics with CKD. The decrease in MPO levels implies that MPO and its derived oxidants such as HOCl (hypochlorous acid) interferes with various cell functions which may contribute to damage of renal tissues resulting in the accumulation of uremic toxins which indicates decline in renal function.

Our study demonstrates that there is a progressive fall in mean serum MPO levels with advancing renal disease. MPO is an enzyme which has been shown to play an important role in the initiation and progression of atherosclerosis. Several mechanisms by which elevated levels of MPO can promote cardiovascular complications have been described [13]. Therefore this study was undertaken to determine the activity of MPO in patients with CKD. However, our results have shown that serum MPO levels are significantly lower in CKD patients with diabetes mellitus as compared to CKD patients without diabetes mellitus. The present study has also shown a significant negative correlation between Urea and MPO in CKD-DM; while no significant correlation was observed in the CKD-ND subjects. Hence, it could be speculated that the decline in MPO levels in CKD patients might be due to the inhibitory action of uraemic toxins, particularly CNO-, on this enzyme.

**Conclusion**

Estimation of serum MPO in CKD patients can be helpful in better prognosis. This study shows that serum MPO levels can be used an indicator for CKD patients with Diabetes mellitus in assessing the renal impairment and to prevent further complications. Microalbuminuria should be corrected at an early stage to delay the renal damage and development of cardiovascular complications in CKD patients.

**Source of Funding:** Self financed.

**Conflict of Interest:** None

**References**

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Effect of Telemonitoring Versus Conventional Physiotherapy Techniques in Improving Grip Strength among Postmenopausal Home Makers

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Abstract

Background: Hand grip strength is an important for performing hand movements in day to day activities. Reduction in same is caused by age, postmenopausal and repeated performance of chores. Studies suggest that reduced isometric is due to menopause. Telemonitoring use is becoming increasingly common all over the world. However, supplemental evidence to further the use of telemonitoring for providing enhanced service access to postmenopausal women with decreased hand grip strength is limited, causing a need to find out telemonitoring effect in performing exercises. Methodology: Experimental study of pre-post type was conducted among postmenopausal home makers with convenient sampling of 60 samples within age group of 45-60 in Chennai. Nordic questionnaire was given to find out musculoskeletal problems. Selected participants were given Patient Rated Wrist Hand Evaluation to rate pain and tested for hand grip strength in right dominant hand using Jamar Hand Held Dynamometer. Based on results, participants were taught hand grip strengthening exercises and asked to perform for 3 days per week for 6 weeks. They were divided into three groups; was monitored using video, second was taught and given a printout of exercise and third were just taught. Post test was done on completion of 6 weeks. Results: Group A which underwent telemonitoring for 6 weeks has shown a significant change in mean value between the pre test and post test of hand grip strength in the dominant right hand at P<0.005. Conclusion: In accordance with the statistical result, all those who have underwent telemonitoring exercises have shown significant improvement in the hand grip of the dominant right hand. Thus, there is a significant effect of telemonitoring exercise in improving grip strength among postmenopausal home makers.

Key Words: Hand grip, Post menopausal women, Hand exercises, Telemonitoring.

Introduction

Menopause, a stage in life of women when the menstruation ceases. It is the end of women’s reproductive years and is regarded as a normal part of ageing. [1] Menopause usually occurs in a women’s late 40s to early 50s. Menopausal women experience musculoskeletal changes such as muscle atrophy, muscle weakness and osteoporosis. [1] The reason for musculoskeletal pain (MSK) in postmenopausal women are multi factorial such as age, body mass index etc. [2]

The prevalence rates of MSK pain is found to range from 53.4% to 85.0%. [3] A large percentage of the patients develop chronic or recurrent MSK pain beyond menopause. Several studies show that, there is even a decrease in the hand grip strength of postmenopausal women as age progresses.

Hand grip strength is an indispensible part of performing everyday activities. Being bereft of strength and vigor may possibly be due to the combined effects of physical and psychological factors. Physical factors


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include reduction in contracting muscle fibers, reduction in firing rate of motor unit. Psychological factors include pain, fear of pain, and fear of injury. Hand grip plays a very important role in performing every household activity. The reduction in hand grip strength could be amounted to age factor, post menopausal cause and repeated performance of household chores. [5]

Kjerland (1953) reported that women attain maximum grip strength between the ages 25 and 26. [3] This finding suggests that menopause may be one of the primary reasons which cause a loss in isometric strength. This loss can be reduced by giving hand grip strengthening exercises and monitoring the accuracy of the movements performed. [9] The substantial barriers to monitor the accuracy of the movements performed must be avoided in order to provide effective results. Thus there is a need for creative strategies such as telemonitoring to enrich and assess the physiotherapy services for decreased hand grip strength in high need communities. [10] The usage of telemonitoring is raising commonly all over the world [10]. The available evidence to further the case for its use in improving access to physiotherapy services among postmenopausal women with decreased hand grip strength is limited. Thus, there is a need for finding out the effect of telemonitoring in performing the hand grip strengthening exercises.

Methodology

Study design was experimental, pre post test type. Total 60 samples who underwent menopause naturally were selected between the age group of 45-60 in and around Triplicane, Chennai, with pain in their wrist and hands for the past 6 months as analyzed in the Nordic Questionnaire were included. Subjects whose pre test of measuring the hand grip strength in the dominant right hand which measured <25.35 Kg and the Patient Rated Wrist/Hand Evaluation (PRWHE) scale rating between 31-70 were all included in this study. Subjects with PRWHE scale rating 0-30 and 71-100, Rheumatoid hand, Peripheral nerve injury, Type II Diabetes mellitus, Recent hand fractures, Recent hand surgery, Burns in hand, Osteoarthritis in hand, Subject with surgical menopause (hysterectomy), Subject who were on hormonal replacement therapy, History of any neurological and musculoskeletal disorders were excluded.

Sixty eligible post menopausal home makers were selected randomly according to the inclusion and exclusion criteria, and were given a Nordic questionnaire. Out of sixty, fifty six participants who were suffering from pain in their Wrist and Hands for the past six months were included in this study. Participants were explained clearly about the procedure and informed consent was obtained. A pretest was done which consisted of measuring the Hand grip strength of the dominant right hand with the Hand Held Dynamometer before intervention. During the measurement, subject was made to sit with back, pelvis, and knees as close to 90 degrees as possible, shoulder is adducted and neutrally rotated, elbow flexed at 90 degrees, forearm neutral, wrist held between 0-15 degrees of ulnar deviation. The arm is not supported and the dynamometer is presented vertically and in line with the forearm. The dynamometer was held in the right dominant hand and directions were given to squeeze the dynamometer with the maximum isometric effort. The readings were noted. The subjects were also asked to rate their pain and functional difficulty in their wrist/hands in the Patient Rated Wrist Hand Evaluation (PRWHE) scale. The subjects whose grip strength measured less than 25.35 Kg and the PRWHE scale rating between 31-70 were included in this study. Forty six eligible participants were explained clearly about the procedure and written informed consent was obtained.

Hand grip strengthening exercises was taught to all the participants which included normal movements such as wrist flexion, wrist extension, ulnar deviation, radial deviation, making and unmaking of fist, opposition of the thumb and exercises to be done with the putty (Fig.1) such as Scissor spread, Thumb press, Thumb extension, Thumb pinch strengthening, Thumb adduction, Three jaw chuck pinch, Finger hook, Full grip, Finger extension, Finger scissor, Finger spread.
Each exercise 5 repetitions on 1st week, 7 repetitions on 2nd and 3rd week, 9 repetitions on 4th week and 10 repetitions on 5th and 6th week for 3 alternative days for per week. Later, the forty six participants were divided into three groups randomly as GROUP A, GROUP B, GROUP C. Video calling facility was set up in the house of the participants of Group A and their accuracy of the exercises performed was monitored. Group B participants were given a print out of the exercises to be performed with illustrations and pictures in it. Group C participants were only taught the exercises without any follow up. Post intervention, measurement of the dominant right hand strength and scoring of the PRWHE scale was done.

Group A participants were given a Telemonitoring Satisfaction Survey Form (TSS) to see the impact on telemonitoring. It consisted of eight items rated on a 5-point scale (1= completely disagree, 5=completely agree). Questions on following themes like:

**Comfortable being evaluated & intervene**

**Video monitoring was as accurate as being face to face**

Areas of Functional Independency considered
Technology interference with the protocol

Clarity of the video and audio

Continuing rehab through video helped in improving grip strength

‘e-rehab services’ help you to save your monetary expenses

Would use televideo process again

DATA ANALYSIS

Dominant right hand grip strength measures were calculated, analyzed and tabulated. The data analysis was done by using SPSS version 20.

A. EFFECTIVENESS OF DIFFERENT METHODS OF EXERCISE PRESCRIPTION BETWEEN GROUPS

<table>
<thead>
<tr>
<th>TABLE 1: COMPARISON OF MEAN GROUP A VS GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN DIFFERENCE OF A</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>8.28</td>
</tr>
</tbody>
</table>

Table 1 shows the mean difference, t value and P values of Group A and Group B

<table>
<thead>
<tr>
<th>TABLE 2: COMPARISON GROUP A VS GROUP C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN DIFFERENCE OF A</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>8.28</td>
</tr>
</tbody>
</table>

Table 2 shows the mean difference, t value and P values of Group A and Group C

GRAPH 1 shows the results of Nordic questionnaire
**Graph 2**: Graph 2 shows comparison of mean values of pre and post test of dominant right hand grip strength of all three groups.

**Graph 3**: Graph 3 shows comparison of mean values of pre and post test of dominant right hand PRWHE scale rating of all three groups.

**Graph 4**: Graph 4 shows the results of Telemonitoring Satisfaction Survey form.

**Results**

Graph 1, 93.3% of the participants suffered from pain in their wrist and dominant right hand.

Graph 2 the variation in grip strength between the three groups is noticeable which is evident from the change percentage as in Group A (31.81%), Group B (18.19%), Group C (14.24%) with P<0.005. Thus, there was a significant improvement in the grip strength of all the participants.

Table 1 and Table 2 shows the comparison of the mean difference of Group A=8.28, Group B=4.23, Group C=3.17 with P<0.005, it is evident that Group A which underwent telemonitoring for 6 weeks had a convincing increase in the grip strength of all the 16 participants.

Graph 3, the mean score of participants in the pre test and post test of the PRWHE scale has reduced; pain (to), specific activities (to), usual activities (to), which shows that there is very little effect of conventional method in improving the grip strength.

According to Graph 4, 60% of the participants were satisfied with the telemonitoring process.

**Discussion**

The primary purpose of this study was to assess the impact of six weeks ‘Telemonitoring’ focusing on strengthening the hand grip while at home to the post menopausal home makers by performing hand grip strengthening exercises by performing normal wrist movements and exercises using a putty. The monitoring was done through video.

Hand grip strength is important for performing hand movements in day to day activities. Reduction in same is caused by age, postmenopausal and repeated performance of chores.

According to some studies postmenopausal causes decrease in hand grip strength and hand function. Also, musculoskeletal pain have showed a decline when the exercises done were monitored through video.

Statistical analysis of this study showed that the group which underwent the process of telemonitoring have significant changes in mean values from 17.75 to 26.03 between pre and post test of measuring the hand grip in the dominant right hand.

Statistical analysis of this study showed that the group which performed exercises seeing the print out given have significant changes in mean values from 19.933 to 24.37 between pre and post test of measuring the hand grip in the dominant right hand.

Statistical analysis of this study showed that the group which were only taught the exercises without any follow up have significant changes in mean values from 19.07 to 22.03 between pre and post test of measuring the hand grip in the dominant right hand and the PRWHE.
scale rating also showed a significant change in the functional ability which is evident from the mean values of pain scale from 35 to 15, specific activities from 40 to 20, functional activities from 45 to 18.

Statistical analysis of this study showed that 60% of the participants who underwent the process of telemonitoring stated that this method of exercise training was beneficial to them, 13% had a neutral opinion and 27% reported that they were not satisfied with this kind of training since they found it very new to get adapted.

Therefore this study revealed that the process of Telemonitoring was found to be beneficial for most of the postmenopausal women who had reduced hand grip strength and difficulty in performing functional activities.

**Conclusion**

As with the statistical results, the hand grip strengthening exercises for the postmenopausal home makers by the use of concept Telemonitoring can lead to improvement in functional abilities in daily routine. Thus, there is a significant effect of telemonitoring exercise in improving grip strength among postmenopausal home makers. The limitations of the study are Sample size was small, Study was pertained to a particular population, there were connectivity issues since the internet was not stable, exercises were performed only once in a day, only hand muscles were concentrated for the intervention, only dominant right hand was concentrated. Recommendations for the further study are larger sample size can be used, study duration can be increased, exercises frequency for per can be increased, non dominant hand measurement can also be considered, intervention can be given to whole upper limb, a comparison between men and women can be done, Telemonitoring could be done to other musculoskeletal disorders, Study could be done on wider population.

**Conflict of Interest:** There is no conflict of interests.

**Source of Funding:** This study is self-funded.

**Ethical Clearance:** This study is not applicable for ethical clearance.

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Study of Social Stigma among Tuberculosis Patients from Northern India

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Abstract

Background: Identification of reasons behind TB stigma will enable us to provide programmatic inputs for effective intervention strategies. Aim of this investigation was to study the social stigma among the tuberculosis patients. Method: One hundred and fifty tuberculosis patients seeking treatment at DOTS centers were interviewed using semi-structured, pre-tested questionnaire. Subjects diagnosed with tuberculosis, taking treatment at these DOTS centers and patients of age more than 18 years formed the inclusion criteria. Study subjects were randomly selected and interviewed when they visited the DOTS center. Results: Out of total, 65.3% subjects experienced stigma. 42% had fear of disclosing illness to his or her friends. Almost 31% did not disclose their illness to friends. In 20% of the cases, their friends avoided them after knowing about their illness. About 64% had fear of disclosing illness at place of work. Almost 34% of study subjects did not disclose their illness at workplace. Problems related to marriage prospects were expressed by 48.6% of unmarried female patients. Conclusion: Stigma among tuberculosis patients still remains a problem. We found scope to improve various aspects like motivate patient’s family to provide family support, involvement of community DOTS providers in order to reduce negative reactions of the family. Client centered tailored approach to reduce TB stigma is expected to pay dividends towards effective tuberculosis control.

Keywords: Tuberculosis, Social stigma, Workplace.

Introduction

Tuberculosis (TB) remains an important public health problem of our country. India accounts for nearly one fifth of the global TB burden. Every day in India more than 20,000 people develop the disease, and more than 1000 die from TB.¹ TB patient not only experiences physical sufferings but also psychological trauma and social consequences. TB is a classical example of a disease with both medical and social dimensions, characterized by its close relation to poor socio-economic conditions.² Recently social stigma has increasingly been recognized in tuberculosis patients.

Social stigma is ‘an undesirable or discrediting attribute that an individual possesses, thus reducing that individual’s status in the eyes of society’.³ Stigma to TB is a critical factor, which not only delays the initiation of treatment but is also a key factor in non adherence to TB treatment. TB is already a highly stigmatized disease.² It is known that stigma in TB is perpetrated and reinforced by health staff, family, neighbours, and other groups.⁵,⁶

Usually men deal with stigma at work place and community level whereas women have to deal it within the household and in the immediate neighborhood and

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society. Identification of the sources and consequences of stigma will enable us to provide programmatic inputs for effective intervention strategies. Therefore this study was done to assess the social stigma among the tuberculosis patients attending DOTS centers. Another objective was to find out the factors related to social stigma perceived by them.

Materials and Method

Department of sociology and community medicine conducted this cross-sectional study jointly during May-December 2017. Tuberculosis patients taking treatment at DOTS centers in the study area formed the study population. Information about DOTS centers in the study area was fetched from the office of civil surgeon. Based on that information, five DOTS centers were selected randomly. Purposive sampling technique was adopted. Thirty eligible patients were interviewed at each DOTS center. Thus sample size was 150. Patients diagnosed with tuberculosis, seeking treatment at these DOTS centers and patients of age more than 18 years formed the inclusion criteria.

DOTS centers were approached around 11 am. Study subjects were randomly selected and interviewed when they visited the DOTS center. Four to five interviews were conducted in a single day. One DOTS center was covered in one such visit. A single interviewer conducted all the interviews to keep sense of uniformity. It took an average of 20 minutes to complete one interview.

Pre-structured, pretested questionnaire was used for data collection. The questionnaire consisted of questions related to: Socio-demographic profile, Treatment history and Social stigma among TB patients attending DOTS centre. Written informed consent was obtained in the local language from every study subject before conducting each interview. They were explained about the nature and purpose of study and requested to participate. To obtain consent, he read the contents of the consent information sheet out loud to each respondent, who was given the opportunity to ask the questions. They were assured privacy and confidentiality of the information provided.

The collected data was entered in Microsoft Excel. Coding of the variables was done. The analysis was done by Statistical Package for the Social Sciences (SPSS) version 21. Interpretation of the collected data was done by using appropriate statistical methods.

Results

Most patients (56.7%) were in the age group of 18-40 years. Males outnumbered females. Majority (61.3%) of the subjects were married. Most of the study subjects were from nuclear family. (Table 1) Out of total, 98 (65.3%) subjects experienced stigma.

Table 1: Sociodemographic profile of the study subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>18-40 years</td>
<td>85 (56.7)</td>
</tr>
<tr>
<td></td>
<td>40-60 years</td>
<td>54 (36.0)</td>
</tr>
<tr>
<td></td>
<td>&gt;60 years</td>
<td>11 (7.3)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>96 (64.0)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>54 (36.0)</td>
</tr>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>105 (70.0)</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>45 (30.0)</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>92 (61.3)</td>
</tr>
<tr>
<td></td>
<td>Unmarried</td>
<td>58 (38.7)</td>
</tr>
<tr>
<td>Family Type</td>
<td>Nuclear</td>
<td>108 (72.0)</td>
</tr>
<tr>
<td></td>
<td>Joint</td>
<td>42 (28.0)</td>
</tr>
</tbody>
</table>

Most study subjects were beneficiary of the treatment category I of DOTS. Around 85% of the participants were suffering from pulmonary tuberculosis. Majority of cases were receiving intensive phase of treatment. (Table 2)

Table 2: Treatment profile of the study subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment category</td>
<td>Category I</td>
<td>112 (74.7)</td>
</tr>
<tr>
<td></td>
<td>Category II</td>
<td>38 (25.3)</td>
</tr>
<tr>
<td>Type of TB</td>
<td>Pulmonary TB</td>
<td>127 (84.7)</td>
</tr>
<tr>
<td></td>
<td>Extra Pulmonary TB</td>
<td>23 (15.3)</td>
</tr>
<tr>
<td>Phase of treatment</td>
<td>Intensive phase</td>
<td>91 (60.7)</td>
</tr>
<tr>
<td></td>
<td>Continuous phase</td>
<td>59 (39.3)</td>
</tr>
<tr>
<td>Type of patient</td>
<td>New</td>
<td>112 (74.7)</td>
</tr>
<tr>
<td></td>
<td>Relapse</td>
<td>15 (10.0)</td>
</tr>
<tr>
<td></td>
<td>Treatment after default</td>
<td>11 (7.3)</td>
</tr>
<tr>
<td></td>
<td>Transfer in</td>
<td>7 (4.7)</td>
</tr>
<tr>
<td></td>
<td>Failure</td>
<td>5 (3.3)</td>
</tr>
</tbody>
</table>
Regarding perceived social stigma with friends, 42% had fear of disclosing illness to his or her friends. Almost 31% did not disclose their illness to friends. Twenty percent of the subjects were of the view that their friends avoided them after knowing about their illness. About 64% had fear of disclosing illness at place of work. Almost 34% of study subjects did not disclose their illness at workplace. (Table 3)

Table 3: Perceived social stigma with friends and at workplace

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived stigma with friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of disclosing illness to friends (N=150)</td>
<td>Yes</td>
<td>63 (42.0)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>87 (58.0)</td>
</tr>
<tr>
<td>Disclosed their illness to friends (N=150)</td>
<td>Yes</td>
<td>104 (69.3)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>46 (30.7)</td>
</tr>
<tr>
<td>Reactions of friends (N=128)</td>
<td>Avoidance</td>
<td>26 (20.3)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>102 (79.7)</td>
</tr>
<tr>
<td>Perceived stigma at workplace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of disclosing illness at their workplace (N=83)</td>
<td>Yes</td>
<td>53 (63.9)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>30 (36.1)</td>
</tr>
<tr>
<td>Disclosed their illness at workplace (N=65)</td>
<td>Yes</td>
<td>43 (66.1)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>22 (33.9)</td>
</tr>
<tr>
<td>Reaction at work place (N=43)</td>
<td>No change in behavior</td>
<td>21 (48.8)</td>
</tr>
<tr>
<td></td>
<td>Isolation</td>
<td>9 (20.9)</td>
</tr>
<tr>
<td></td>
<td>Avoidance</td>
<td>9 (20.9)</td>
</tr>
<tr>
<td></td>
<td>Leave job</td>
<td>4 (9.3)</td>
</tr>
</tbody>
</table>

Thirty seven percent of females compared to 26% of males felt bad about behavior of others to them after knowing their illness. Gender difference (87% of females and 81% of males) about sympathetic and concerned reaction of the family was found to be statistically significant. 37% of females and 19.8% of males were shocked and upset by reaction of family members. Concern about marriage was revealed by many unmarried study subjects (48.6% of females and 51.4% of males). (Table 4)

Table 4: Perceived stigma by the patients and family reaction.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Gender</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male N (%)</td>
<td>Female N (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel liability to the family</td>
<td>26 (27.1)</td>
<td>21 (38.9)</td>
</tr>
<tr>
<td>Feel bad about others behavior</td>
<td>25 (26.0)</td>
<td>20 (37.0)</td>
</tr>
<tr>
<td>Feel guilty</td>
<td>21 (21.9)</td>
<td>18 (33.3)</td>
</tr>
<tr>
<td>Feel inferior/degraded</td>
<td>15 (15.6)</td>
<td>14 (25.9)</td>
</tr>
<tr>
<td>Feel alone</td>
<td>14 (14.9)</td>
<td>15 (27.8)</td>
</tr>
<tr>
<td>Delayed treatment seeking</td>
<td>10 (10.4)</td>
<td>9 (16.7)</td>
</tr>
<tr>
<td>Sympathetic and concerned</td>
<td>78 (81.2)</td>
<td>47 (87.0)</td>
</tr>
<tr>
<td>Shocked and upset</td>
<td>19 (19.8)</td>
<td>20 (37.0)</td>
</tr>
<tr>
<td>Isolation</td>
<td>9 (9.3)</td>
<td>14 (25.9)</td>
</tr>
<tr>
<td>Concern about marriage among unmarried (n=58)</td>
<td>Yes</td>
<td>18 (51.4)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>12 (52.2)</td>
</tr>
</tbody>
</table>

*Multiple responses permitted

Discussion

Stigma is perceived as an important social determinant of health. Tuberculosis is a social disease with medical manifestations in true sense. When diseases are stigmatized, individuals show reluctance in seeking medical care and non-adherence to treatment probably due to fear of the social and economic consequences following diagnosis. In this study, 65.3% subjects experienced one or other forms of the stigma. Our findings confirm the results of another study from
Thailand, which shows that stigma is present on patients perspective towards TB. Another study from Delhi is also in concordance with our observations. Understanding patient’s perception about tuberculosis will enable better design of a client- oriented comprehensive programme for tuberculosis. By identifying both the sources and consequences of stigma, social science research has elucidated the need for effective intervention strategies.

We observed that 42% had fear of disclosing illness to his or her friends. Almost 31% did not disclose their illness to friends. A similar finding was recorded by Rajeswari R et al in her study on perceptions of tuberculosis patients about their physical, mental and social well-being. She observed that 6.7% of patients gave wrong names and addresses to avoid being exposed as TB patients to their acquaintances. These results are cohort with others. It could be due to feeling of insecurity, less autonomy and power, feeling of loosing the job perceived by the patients.

It was observed in this study that 37% of females and 19.8% of males were shocked and upset by reaction of family members. It is a common myth among people that the food/utensil gets contaminated on being used by a person who eats from it, if he or she is having some disease like tuberculosis. TB patients are often subjected to such unnecessary sanctions at home. Fears about getting infected with TB, often lead to isolating experiences such as forcing a TB patient to use a separate utensil. Other forms of isolation included washing clothes separately, giving separate room, neglect by the families and not being permitted to attend the social functions with more male patients reporting this.

Patients with low TB knowledge were more likely to have severe forms of TB disease. Another study was conducted in Thailand to assess social stigma, knowledge and belief about TB/HIV co-infected patients. In that study, 65% reported high TB stigma, 23% had low TB knowledge and 49% were having low HIV knowledge. We find a definite scope to motivate patient’s family to provide family support and involvement of community DOTS providers in order to reduce negative reactions of the family.

Not surprisingly our study shows that problems related to marriage prospects were expressed by 48.6% of unmarried female patients. Another study reported that parents of the young women don’t want to reveal their daughter’s illness or don’t want to send them to DOTS due to difficulties that may arise in marrying them. It was also noted that unmarried females deliberately looked for health care center for her treatment far away from home because they had apprehension that disclosure of the diagnosis could cause them harm in searching a partner for her marriage. The impact of TB-related stigma on marriage was also noted in few other investigations. Many of these found that TB-related stigma affected the marriage prospects of both genders, with men having a slightly more difficult time finding a wife in areas with a low female/male ratio. Another author from Sialkot observed divorce as a direct consequence of TB to be more likely to affect females and TB-infected females were more likely than TB-infected males to face difficult marital prospects.

There are several strengths of this study. Firstly, study conducted by collaborative efforts of a sociologist and medical fraternity enabled us to study various aspects of tuberculosis in a better way. Secondly, we studied social stigma among tuberculosis patients, a very pertinent aspect of TB. Adherence to TB treatment is expected with reduction in stigma. There are few limitations as well. Relation between stigma and education and socioeconomic status was not carried out in this investigation. Reactions of family with educational status of the family were also not studied here. Such dimensions shall be carried out in further studies.

Conclusions

Findings of the present study indicate that stigma among tuberculosis patients still remains a problem. Keeping factors behind such stigma in mind, we found scope to improve various aspects like motivate patient’s family to provide family support, involvement of community DOTS providers in order to reduce negative reactions of the family. Such client centered tailored approach to reduce TB stigma is expected to pay dividends towards effective tuberculosis control.

Ethical Clearance- Taken from Intuitional Ethics Committee.

Conflict of Interest - Nil

References

1. Long NH, Johansson E, Diwan VK, Winkvist


Effect of Yoga on Anxiety in School Going Children of Age 12-14 Years

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¹Post Graduate Student, ²Assistant Professor, ³Assistant Professor, Nitte Institute of Physiotherapy, Nitte (Deemed to be University), Deralakatte, Mangaluru

Abstract

Background: Anxiety is one of the most common cause of delay in academic progression in school going children. There are many schools which are still unaware of such problems faced by children and its ill effects. This study focuses on effect of yoga on anxiety for such children.

Aim: The aim of the study was to compare the effect of yoga and General awareness on reduction of anxiety in school going children of age 12-14 years.

Methodology: 93 school going children were screened using Westside Test Anxiety Scale. 57 children were eligible and were included in the study. They received treatment for 40 minutes a day, 5 days a week for 30 days. Pre and Post treatment their anxiety as well academic results were collected and assessed.

Results: Paired sample t-test was used to compare effectiveness of intervention on anxiety score for which mean pre-score was 2.59±0.51 for intervention and 2.93±0.50 for General awareness group. And post were 2.03±0.78, 2.54±0.66 respectively.

Conclusion: Yoga as an intervention was more effective in treating academic anxiety compared to General awareness intervention for 12-14 years children.

Keywords: Yoga, anxiety, children, General awareness, Re-education, Westside Test Anxiety Scale

Introduction

Anxiety is an emotion which comprises feelings of tension, worried thoughts and physical changes like increased blood pressure¹. Academic anxiety is a type of state anxiety which relates to the unpleasant things from the environment such as academic institutions including teachers and certain subjects.²

The feeling of anxiety is mixture of our perception of events or situations and our body’s physiological reaction. In response, the body prepares to fight or flight, pumping more blood to the heart and muscles and tapering down of all non-essential functions. This builds up more anxiety which explicit in the form of psychogenic symptoms or anxiety disorders.³

The core risk phase for development of symptoms and syndromes of anxiety is considered as childhood, adolescence and teenage which may range from brief mild symptoms of anxiety to full-fledged anxiety disorder. The period around puberty is considered as tactful period for development of anxiety. The gender difference at the time of puberty is said to have relation to severity and the types of anxiety and other psychopathology.⁴

Untreated anxiety disorders may have ill effects which can have both short and long term detrimental effects in children of adolescent age.

The overall estimated prevalence for anxiety disorders globally is 8% that makes it as the most common psychiatric diagnosis in school going children.
(ranging from 4 to 25 %). The report of Indian study quotes incidence of childhood psychiatric disorders as 18/1000 per year.4.

Test anxiety is a transitory emotional state. Factors which influences the level of anxiety in children are problems related to recalling information, difficulty in memorizing things, poor study techniques and lack of confidence and time management skills.5

Test anxiety is directly proportional to the difficulty level of the tests and their importance in successful progress of the students.5

The demographic variables which may influence test anxiety levels include age, gender, ethnicity, area of residence and type of family.5

Yoga is the science to keep mind calm and steady and the emotions by overcoming anxiety conditions and attaining relaxation. Yoga therapy is practical discipline incorporating a wide variety of practices whose goal is the development of a state of mental and physical health, wellbeing, inner harmony and ultimately a union of human individual with the universal.7

The main highlight of yoga is that it can coordinate psycho physiological response, which is the contrast to the anxiety response.8

The science behind yoga works on the outermost layer of personality and physical body.9

The beauty of yoga is that it travels from physical levels and moves in to mental and emotional level.10

At intellectual level yoga can sharpen memory, improve concentration and decrease anxiety levels. At spiritual level yoga creates an alertness to search for happiness within oneself and to be at peace.11

There are studies done on the other variables which influences levels of anxiety and also in other age group. Awareness on how it can be treated very easily is less. There are many ways by which anxiety is targeted including yoga in other age group children. But, there is no retrieved literature which targets test anxiety by yogic methodology in 12-14 year old children. So, there is need to do a study on this aspect.

**Materials And Method**

The investigator visited many schools in Mangaluru and selected a school which was not giving yoga. Children were recruited from Vishwa Mangala English medium school, Konaje, Mangaluru. Prior to commencement of study institutional ethical clearance was obtained. Procedure was explained and consent and permission letter was taken for the same. The children between 12-14 years was assessed using Westside test anxiety scale questionnaire. It was assessor blinded. 93 students were assessed initially before their academic test and their form was evaluated. Children who were 12-14 years and were school going both boys and girls, children having anxiety between 2.0-5.0 in Westside test anxiety scale were included in the study. Children undergoing yoga therapy already and children undergoing psychological counseling were not taken for study. As per inclusion criteria only 57 students were opted for the study.

57 subjects were divided by convenient sampling method, 32 were in intervention group and 25 were in pamphlet group.

Students started receiving interventions immediately after their 1st academic test. The intervention group received yoga as a therapy for 30 days, weekly 5 days for 40 minutes.

They were not told the purpose of giving yoga. They were given yoga in school auditorium were no benches and desks where present and it was well ventilated room with good amount of light entering the room. Consent was taken from their parents. And only those students were included who were interested to undertake this program.

They were assessed after their academic test with same outcome measure and their pre and post academic test marks were collected from the school for further analysis.

Other group which was of general awareness group, they received re-education pamphlet on how to reduce anxiety and they were asked to read it and apply it on them. After their test and after 30 days of span even they were assessed using Westside test anxiety scale. Even their academic marks were collected for analysis.

**MATERIALS REQUIRED**- Classroom or any hall without benches and desks, Yoga mat, printed counselling pamphlet, outcome measure forms, and pens.
YOGA INTERVENTION GROUP-

Sitting in Vajrasana – Namskara mudra- Chant om (9 rounds) (2mins) ṭ, Bhunamana STANDING- Hands in and out breathing (2mins), Ankle stretch breathing (2mins) ṭ, Hands stretch breathing (2mins), Trikonasana breathing (2mins).

SUPINE SERIES- Shavasana, Straight leg raising (alternate leg) breathing (2mins) ṭ

Setubandasana breathing (2mins).

PRONE SERIES-Bhujajasana breathing (2mins), Shalavasana breathing (2mins).

SITTING-Rabbit breathing (2mins) *, Dog breathing (eyes closed) (2mins), Tiger breathing (2mins) ṭ, Shashankasana breathing (2mins).

Relaxation (3mins) shavasana. Sitting in vajarasana – end the session by chanting shanthi mantra

GENERAL AWARENESS GROUP-

General education in the form of printed pamphlets which includes remedial measures.

Statistical Analysis

The collected information was summarized using the descriptive statistics such as frequency, percentage, mean and S.D.

To compare the outcome measures between the 2 groups independent sample t-test was used. To compare the pre and post measurements paired t-test was used. To compare difference and proportion chi-square test was used.

The p value less than 0.05 was considered as significant.

Table 1- Comparison of pre-test anxiety scores according to groups

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D</th>
<th>t value</th>
<th>p value</th>
</tr>
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<tbody>
<tr>
<td>Intervention</td>
<td>2.59</td>
<td>0.51</td>
<td>4.35</td>
<td>0.011</td>
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<tr>
<td>General awareness</td>
<td>2.93</td>
<td>0.50</td>
<td></td>
<td></td>
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Independent sample t test was used to compare pre-test scores according to the groups for which mean was 2.59 ± 0.51 for intervention group and 2.93 ± 0.50 for general awareness group. The obtained p value was <0.05 and hence there was difference in anxiety score between the groups.

Table 2 –Comparison of pre academic performance results according to group

<table>
<thead>
<tr>
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<th>Mean</th>
<th>S.D</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
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<tr>
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<td>-0.903</td>
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<tr>
<td>General awareness</td>
<td>13.52</td>
<td>4.52</td>
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</tr>
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</table>

Independent sample t test was used to compare pre-academic performance results according to the groups for which mean was 13.59 ± 4.71 for intervention group and 13.52 ± 4.52 for general awareness group. The obtained p value was <0.05 and hence there was difference in pre academic performance results between the groups.

Table 3- Effectiveness of intervention on anxiety scores

<table>
<thead>
<tr>
<th></th>
<th>Pre-score</th>
<th>Post-score</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D</td>
<td>mean</td>
<td>S.D</td>
</tr>
<tr>
<td>Intervention</td>
<td>2.59</td>
<td>0.51</td>
<td>2.03</td>
<td>0.78</td>
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<tr>
<td>General awareness</td>
<td>2.93</td>
<td>0.50</td>
<td>2.54</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Paired sample t-test was used to compare effectiveness of yogic intervention on anxiety score for which mean pre-score was 2.59±0.51 for intervention and 2.93±0.50 for general awareness group. The obtained scores after intervention was 2.030.78 for intervention group and 2.54± 0.66 for general awareness group. The obtained p value was <0.05 for both interventional and general awareness group. The interventional group p value is less than general awareness group. Hence, intervention group is more effective.
Paired sample t-test was used to compare effectiveness of yogic intervention on anxiety score for which mean pre-score was 13.59±4.71 for intervention and 13.52±4.52 for general awareness group. The obtained scores after intervention was 14.09±3.10 for intervention group and 14.56± 4.44 for general awareness group. The obtained p value was <0.05. Hence there was effect.

**Discussion**

Age around puberty i.e., 12 – 14 years is considered as most vulnerable age for the development of anxiety.4

In earlier studies it was targeted on children between 15- 18 years; high school children, as it is the peak time in schooling and turning point for major career goals26. Noggle et al shows that age at which most mental disorders begins in adults, occurs during childhood and adolescent age. In that around 7.5% of adolescents meets DSM IV-TR criteria for one or more mental health condition is increasing the anxiety affects at earlier ages of life.28 Also reduced physical activity and more classroom teachings increases the risk of anxiety. Therefore this study targeted on anxiety levels of those children. One of the study conducted by Chaman Lal Banga on academic anxiety levels of secondary school children in 2015 showed 16% of children getting affected with anxiety of similar age.2

The reason why yoga must have helped in reducing anxiety at schools as concluded by one of the systematic review states that the practice of yoga emphasize body awareness and involves focusing ones attention.27 Since our study focused on breathing exercise which had very interesting animal related name, it made children to enjoy on what they were doing and pulled their attention on their body.

Since it was breathing exercise it produced effects such as relaxation, self-control, concentration, self-efficacy and body awareness. Yoga practice reduces psychological arousal.26

One of the study, effect of shambavi mudra protocol on breathing regulation on perceived stress and well-being in healthy population where 21 minute intervention for 6 weeks had a significant reduction in perceived stress and anxiety 26 which was similar to our study which had 40 minute of breathing exercise for 4 weeks and showed positive results.

There is an executive function that is still not mature in children and adolescents. Yoga techniques which is related to breathing helps add attentional control. As frontal lobe matures children’s capacity to exercise attentional control increases.28

For pamphlet group it was more of sedentary classroom based education more than physical. It was self-administered. It was completely ones choice to accept it or not. However both the groups had significant but intervention group had more compared to that of pamphlet group.

In addition to that this study also collected student’s test results which was conducted on monthly basis post intervention and compared it with the results of pre intervention.

There are very limited evidence of RCTs observing the effects of yoga on psychology and cognitive functions in school setting. And this could be one of the study proving benefits of yoga on anxiety in school setting with positive results for lesser age group.

In future this will be part of teaching students about wellness and health and that of primary academic instruction. For the children who are suffering from anxiety related problems this could create difference in
the matter of success and failure both in their personal and professional life.

However the study has some limitations like Small sample size with only one school taken for the study due to time and permission constraint because it was out of their academic curriculum. Level of anxiety may differ from different schools and different board of education.

**Conclusion**

The results of the present comparative study concludes that yoga as an intervention was more effective in treating academic anxiety compared to re-education pamphlet intervention for 12-14 years children.

This study also shows that yoga as an intervention can also help in improving academic performances in children of this age group which is added benefit of this.

**Conflict of Interest**- A statement on conflict of interest- Authors declare no conflict of interest.

**Source of Funding**- self.

**Ethical Clearance** – institutional ethical clearance obtained.

**References**


25. Driscoll R. Westside Test Anxiety Scale Validation [Internet]. American Test Anxiety Association; 2004.


Expectation of Life by Employment Status in India

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Abstract

Introduction: Life expectancy is a powerful summary measure of life tables. The mortality pattern of a population is influenced by considering the changing trend in the value of life expectancy. These in turn assess the progress of the nation by highlighting the issues of equity, poverty, and gender. One of the important socioeconomic aspects of mankind is the length of working life i.e. in employment status. The employment status of an individual determines economic potentiality, which in turn ensures economic security as well as increases participation rates in society and the economy.

Method and materials: In this context this study will measure gender wise life expectancy by employment status among urban and rural populace of India. The data is secondary, taken from Sample Registration system (SRS) and National Sample Survey (NSS).

Findings and Conclusion: This study reveals that life expectancy by employment status varies among its male and female population. A larger value of life expectancy by employment status is observed for rural populace of India as compared to its urban.

Keywords: Life expectancy, Employment status, Rural and Urban population of India, Male-female population

Introduction

Life expectancy is a powerful summary measure of life tables. The mortality pattern of a population is influenced by considering the changing trend in the value of life expectancy. A decent standard of living is one of the essential elements in gaining life expectancy. Hence life expectancy is considered as an index of social well being. These in turn assess the progress of the nation by highlighting the issues of equity, poverty, and gender. Further, one of the important socioeconomic aspects of mankind is the length of working life particularly in employment status. The employment status of an individual determines economic viability, which in turn ensures economic security as well as increases participation rates in society and the economy.

It endorses better health and education among employed persons and its dependent members. Hence, it enhances a kind of sense of dignity to the employed people. The expectation of life by employment status of an individual can be obtained by combining mortality rates and labour force participation ratios. (Kintner, 2004)¹. This indicator called life expectancy by employment status gives the average number of years a man or a woman lives in the employment status. It is based on age-specific mortality rates and age specific proportions of employed workers which is computed by life table method. It marks the persons years of life in employment status. One of the earliest works on occupational differences in life expectancy by grouping occupations into five classes was done by Benjamin² in 1969 in England by using 1951 data. He found that mortality was higher in the lowest class as compared to higher classes. A study by Kitagawa and Hauser³ using 1960 data in the United States in 1973 observed that both higher education and higher income were independently associated with longer life expectancy. The benefit was more visible among population having both high income and high

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educational advantage than just having one or the other. Later on in 1993 many researchers opined that this socio-economic difference was widening over time. A study by Valkonen in 1991 also revealed occupational differences in life expectancy in Finland. This study, therefore, in an attempt to measure the gender wise life expectancy by employment status among urban-rural populace of India by analyzing secondary data aspires to associate itself with this global emerging trend.

**Objective**

The objective is to compute life expectancy by employment status for the male and female of urban and rural residents of India for the years 1992-93, 1998-99, 2003-04 and 2008-09.

**Method and Materials**

The data required for calculating life expectancy by employment status are the proportion of employed persons and age specific mortality rates. In this section we discuss the proportion of employed persons and age specific mortality rates in detail as shown below:

**Detail description on age specific proportion of employed persons**

In this study the proportion of employed persons is the age specific usual status worker population ratio (ASWPR) during 1993-94, 1999-2000, 2004-05 and 2009-10 for urban-rural and male-female population of India, obtained from National Sample Survey Organisation/Office (NSSO). In this study the selected ages of expectation of life by employment status are 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60. The life expectancy by employment status at different ages represents the average number of years a man or woman lives if he enters the labour force in that age. Although ages 5 and 10 may seem to be inappropriate entry for the purpose of our study, it should however be noted that in India we have the evil precedence of child labour even from more tender ages. Further, the inclusion of these two age groups in NSSO clearly indicates the prevalence of workers (although in a smaller proportion) of these age group. It is also a fact that the selection of younger ages of 5 and 10 would help in mapping the expectation of life by employment status among the small proportion of persons employed in these ages.

**Aspects on age specific mortality rates**

Another data required for this study is the age specific mortality rates, obtained from Sample Registration System (SRS). The Sample Registration System is a large scale demographic sample survey based on the mechanism of a dual record system with the objective of providing reliable estimates of fertility and mortality indicators at state and national levels for rural and urban areas respectively. In this study life table of SRS 1990-1994, 1996-2000, 2001-05 and 2006-10 with midyear 1993, 1998, 2003 and 2008 respectively as input table has been used. These life tables constructed by the Sample Registration System are used as input for deriving the life expectancy by employment status for the years 1992-93, 1998-99, 2003-04 and 2008-09. The life tables of SRS are considered one year preceding the age specific worker population ratio of NSSO since in NSSO the activity status of a person are measured one year preceding the date of survey. Das and Patel (2004) also refer NFHS1 (National family Health Survey1, 1992-93-93) and NFHS2 (National family Health Survey2, 1998-99-99) to the period 1991-92 and 1997-98 respectively in their study of constructing life tables from two rounds of NFHS,1991-99. Since the NFHS-1 and NFHS-2 death rates are based on the average annual number of deaths occurring to usual residents of the household during the two-year period preceding the survey, approximately referring to the period 1991-92 and 1997-98 respectively. This justifies the study of using \( L_x \) of SRS life tables of 1990-1994, 1996-2000, 2001-05 and 2006-10 as a multiplier with age specific worker population ratio of NSSO of 1993-94, 1999-2000, 2004-05 and 2009-10.

**Steps to compute expectation of life by employment status**

The \( L_x \) of ordinary life table is multiplied with age specific worker population ratio (ASWPR) to obtain the persons year lived by employment status. This is the only new element in life table of employment status and the formula is

\[
E_{nL_x} \text{ by employment status} = L_x * \text{ASWPR}.
\]

Where \( L_x \) is the total number of person-years living in age group \( x \)

ASWPR is the number of persons usually employed in a particular age group per 1000 persons in that age.
And $E_n L_x$ is person-years lived by employment status.

Like in an ordinary life table, life expectancy by employment status ($E_x E$) is estimated by dividing the cumulative person years by employment status ($E_T x$) by the $(l_x)$ column i.e.

$$e_x \text{ by employment status (} E_x E) = \frac{T_x \text{ by employment status (} E_T x)}{l_x}$$

where $T_x$ by employment status ($E_T x$) $= \sum E_n L_x$

### Table 1: Sex wise Expectation of life by employment status at selected ages for urban and rural India during 1992-93, 1998-99, 2003-04 and 2008-09

<table>
<thead>
<tr>
<th>Ages Years</th>
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<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
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<th>45</th>
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<td>1992-93 (MU)</td>
<td>37.03</td>
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<tr>
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</table>
Findings and Conclusions

In this section we first compute expectation of life by employment status at selected ages for the males and females of urban and rural population of India for the years 1992-93, 1998-99, 2003-04 and 2008-09 in table 1. This will help in visualising the portrait of sex wise average length of life by employment status among the urban and rural residents of India along the periods. The life expectancy by employment status in 1992-93 varied from 37.22 (at age 10) to 2.08 (at age 60+) among urban males. In 1992-93, the life expectancy by employment status among the urban females differed from 11.49 to 0.54 in the same ages. Among its rural male masses this value swings from 40.43 at age 10 to 3.25 at age 60+ in 1992-93. The corresponding females figure are 23.19 at age 10 to 1.14 at age 60+ in the same year. In 1998-99 urban males life expectancy by employment status ranged from 6.28 years at age 10 to 1.89 at age 60+. The females of the same year life expectancy by employment status vary from 9.97 to 0.28 years at the same ages as in male population. It is seen that in 1998-99 the rural male life expectancy by employment status swing from 39.37 to 2.97 in the same ages. The figures are 21.75 and 1.03 among female members of rural India. The expectation of life by employment status among the urban males (females) of India in 2003-04 varies from 36.90 (11.19) years at age 10 to 1.73 (0.48) years at age 60+. The corresponding figures in 2008-09 are 36.13 (9.13) and 1.62 (0.34). This figure among rural males (females) of India ranges from 39.75 (23.44) at age 10 to 3.01 (1.21) at age 60+ in 2003-04. In 2008-09, the maximum and minimum expectation of life by employment status among the rural males (females) are 38.81 (18.28) and 3.03 (1.08) years respectively in the same aforesaid ages. It is observed that expectancy years by employment status is higher at age 10 for all the years of rural-urban and male-female population. This table also relates that life expectancy by employment status among urban males was highest in 1992-93 with 37.22 years, followed by 36.90 years in 2003-04, 36.13 years in 2008-09. The lowest of 36.28 years is observed in 1998-99 at age 10. The same sequence is observed for other ages among the urban males of India. However among urban females of India, the longer value of life expectancy by employment status is seen for the 1992-93 with 11.49 years, followed by 11.19 years in 2003-04, 9.97 years in 1998-99 and a small figure of 9.13 years in 2008-09 at age 10. The other selected ages of urban females also follow the similar pattern. This table also relay that life expectancy by employment status among rural males is highest in 1992-93 with 40.43 years, followed by 39.75 years in 2003-04, 39.37 in 1998-99 and 38.81 years in 2008-09. Among its female members this trend is 23.44 years in 2003-04, 23.19 years in 1992-93, 21.75 in 1998-99 and 18.28 years in 2008-09 at age 10. The same pattern is followed by other ages by rural male and female population. In general we observed that life expectancy by employment status in rural India is greater than urban India. The male members lived more years by employment status than its female counterparts both in rural and urban areas. The age 10 is enjoying maximum life expectancy by employment status as compared to other ages among the rural-urban and male-female population of India. The argument for selecting the age 10 is already discussed in the aforesaid section. Swee-Hock13 (1965) also selected 10-14 instead of 15-19 age groups in constructing male abridged working life tables for Malaya for three major ethnicities: Malays, Chinese and Indians for the year 1957. Further Matin (1986)14 constructed life tables for working men and women of Bangladesh from aged 10 years and above by using data from 1981 Bangladesh Population Census.

There is no Conflict of Interest in this paper.

This paper is Funded by the authors themselves.

Since the data is secondary and used with proper arguments the authors do not feel the need of ethical clearance.

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What Determines Gender Preference at Birth? 
A Review Based on Available Literature

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Abstract

Introduction: Every person in this world have equal rights to live irrespective of their gender. Instead of getting equal rights in society as women they are not even getting a right to born. Defining “female foeticide as aborting a female foetus after sex determination test”¹. There are certain factors like preference for son, economic burden to rear a girl child.² Objectives: 1. To identify and describe the reasons for gender preference among antenatal women. 2. To determine awareness and attitude and perception on gender preference and female foeticide. Method: A comprehensive review of published literature and journal articles from Pub Med and EBSCO databases was done by following specific search strategy for each database. Initial 3610 titles were retrieved and after screening 10 articles were selected for full test screening. Finally 10 articles were selected based on the inclusion criteria. Results: Three research studies highlighted that preference for the son is high in our society with various reasons like security in old age, carries the name and fame of the family and financial security and carry out the last days rituals of the parents and daughters are not preferred due to fear of dowry. Two research studies reveal that most of the subjects have favorable attitude against to sex determination and female foeticide. Most of the subjects were aware about Prenatal diagnostic technique act (PNDT). Conclusion: The strong desire for male child will make the families to undergo for female foeticide. Ultimate aim of education is change the behavior. Keywords: Gender preference, female foeticide, Sex-determination, PNDT Act, Antenatal women

Introduction

Every person in this world have equal rights to live irrespective of their gender. The modern society creates a situation for a women in such way that they are in risk group to face multi dimensional problems such as trafficking, acid attacks, rape etc. Female foeticide is one of the serious problem in our society, which is completely against to the human rights. Instead of getting equal rights in society, women are not even getting a right to be born¹. Female foeticide means aborting a female foetus after sex determination test¹. There are certain factors like preference for son, economic burden to rear a girl child, feeling like daughter as parayadhan (others property), fear of dowry, certain cultural influences and misusing of the advanced technologies like Ultrasound, which make the people to commit for female foeticide irrespective of their socio-economic status ². Need for eliminating concept of gender preference:

The sex ratio variation in India is drastic as per the literature and statistics found on electronic data base from 2007-2017. According to censes 2011 sex ratio in India, for every 1000 males there are 918 females. This decline sex ratio leads to various problems in our society like improper family set-up, violence against women.³ The government of India introduced PNDT (Prenatal diagnostics techniques) act with the intention
to prevent the female foeticide. According to this act sex-determination was considered as illegal and the offenders should be punished.

The strong desire for male child will make the families to undergo for female foeticide. Ultimate aim of education is to change the behavior of people. With the help of awareness campaigns and counseling sessions we need to change the behavior of society.

From the above background information it is very clear that the strive of preference for son in the form of female foeticide have lot of impact in our society. Hence a review of literature for identifying the reasons for gender preference among antenatal women carried out.

Methodology

Search Strategy methods:

A computerized search has done to collect the articles which are available in different databases from the year of 2007 to 2017. The search strategy was limited to only English language and considered only the studies which are conducted on human species.

Initial search strategy made by using the terminologies and its synonyms which are processed in databases such as Pub Med-Medline and EBSCO, the key words along with the synonyms were added in the MESH after that search builder was developed based on key words and later on the main search was done. The terminologies which have been used to collect the article are as follows:

Keywords: Awareness, Knowledge, Attitude, Perception, Gender preferences, Female foeticide, Sex determination test and prenatal diagnostic act.

Types of studies

Cross-sectional study, Survey, Phenomological studies.

Types of participants

Antenatal women and married couple.

Settings

Hospitals, Clinics Urban and Rural areas, Educational Institutions.

The systematic search was conducted by framing the terms individually and in combination with all and synonyms, also according to the data base. In addition to this, a manual Google scholar search was under taken using the key words and search synonyms from already found articles. An addition of 3 articles were found. Initial search retrieved 3610 articles over which 96 articles were selected manually. 96 Duplicate records were removed and 22 articles are included according to the eligibility criteria. Among these 5 studies were excluded due to lack of full texts. 7 articles are not related to gender preferences. Hence 10 articles were screened which includes quantitative and qualitative studies.

1. AUTHOR: Vadera, Joshi, Undakat, Yadav & Sudha, 2007. SOURCE AND TITLE: A Study on knowledge and attitude Regarding Gender preference and female foeticide among pregnant women. COUNTRY: India. VARIABLES: Knowledge and attitude on gender preferences and female foeticide. INSTRUMENTS: Structured questionnaire by interview method. SAMPLE AND SAMPLING TECHNIQUE: 195, Systematic sampling. DESIGN: Cross-sectional study. DURATION: 2 Months. FINDINGS: 1.Preference for male child because son carries name of the family and supports them in old age. 2. Subjects were aware about consequences of female foeticide like violence against women and disturbance in the family set up. 3. Few subjects reported that they would opt for female foeticide if the gender of foetus is female. CONCLUSION: Desire for having son in the family is the major reason for declined sex ratio and there is a need for awareness regarding consequences of female foeticide


Level Investigation of Sex Determination in a semi urban Area of Northern India. COUNTRY: India. VARIABLES: Sex determination and associated factors. INSTRUMENTS: Structured interview schedule. SAMPLE AND SAMPLING TECHNIQUE: 983, purposive sampling technique. DESIGN: Cross-sectional study. DURATION: 3 Months. FINDINGS: The study revealed that: 1.Few subjects underwent for sex determination as well as female foeticide. 2. Female foeticide was more in general category caste when compared to other backward caste. 3. The rate of opting for sex determination was low in illiterate and majority of couples who opted for sex determination were literates. CONCLUSION: The study concluded that there is a need for implementing equal property for a girl child. Action should be taken to eliminate gender inequalities in the society.

4. AUTHOR : Bhattacharjya, Shampa Das & Mog , 2014. SOURCE AND TITLE: Gender Preference And Factors Affecting Gender Preference Of Mothers Attending Antenatal Clinic Of Agartala Government Medical College. COUNTRY: India. VARIABLES: Gender preference and factors affecting gender preference, INSTRUMENTS: Semi-structured interview. SAMPLE AND SAMPLING TECHNIQUE: 390, purposive sampling technique. DESIGN: Cross-sectional study. DURATION: 2 Months. FINDINGS: Most of the subjects had preference for a male child especially in rural areas and among illiterates because of security in old age, symbol of status and continuation of future generations. Only few subjects preferred daughters because they help in household work and daughters are considered as goddess LAXMI CONCLUSION: Study concluded that appropriate strategies to improve the security at old age and to remove the dowry system will improve preference for daughters so that the stability in sex ratio can be achieved.

5. AUTHOR : Jagdeep, Rani & Hardeep, 2014. SOURCE AND TITLE: A study to assess the attitude and family support of couples toward the birth of a girl child in selected rural and urban areas of the Punjab. COUNTRY: India. VARIABLES: Attitude and family support on birth of girl child. INSTRUMENTS: Self structured interview. SAMPLE AND SAMPLING TECHNIQUE: 200, purposive sampling technique. DESIGN: Quantitative design (cross-sectional design). DURATION: 3 Months. FINDINGS: 1. Majority of the subjects have favorable attitude towards birth of a girl child. 2. Most of the subjects revealed that family members are supporting for a girl child. 3. Compared to rural area, people of urban area are having positive attitude and family support for a girl child. CONCLUSION: The study concluded that the mean favorable attitude and family support was more in urban couple than rural couple.

6. AUTHOR : Nithin etal., 2014. SOURCE AND TITLE: Awareness and attitudes regarding prenatal sex Determination, pre-conception and pre-natal diagnostic techniques act (PCPNDTA) among pregnant women in southern India. COUNTRY: India. VARIABLES: Semi-structured questionnaire by interview method. INSTRUMENTS: Semi-structured questionnaire by interview method. SAMPLE AND SAMPLING TECHNIQUE: 132, Convenient sampling technique. DESIGN: Cross-sectional study. FINDINGS: Majority of the subjects were aware about sex determination test and subjects knew that ultra-sonography is the method for sex determination. Subjects were aware about PNDT act. Most of the subjects responded that sex determination is illegal and the offenders should be punished. Few subjects were ready for sex determination if they had a chance and few of them were ready for termination of pregnancy if the gender of the foetus was female CONCLUSION: The study concluded that most of the subjects are ready for sex determination which indicates there is a need for providing awareness on legal punishments.

7. AUTHOR : Pavithra, Dhanpal & Lokanath,2015. SOURCE AND TITLE: A study of gender preference, knowledge and attitude regarding prenatal diagnostic techniques act among pregnant women in an urban slum of Bengaluru. COUNTRY: India. VARIABLES: Knowledge and attitude regarding gender preference and prenatal diagnostic act INSTRUMENTS: Structured questionnaire (few open ended questions). SAMPLE AND SAMPLING TECHNIQUE: 100, purposive sampling technique. DESIGN: Quantitative (cross-sectional design). DURATION: 3 Months. FINDINGS: Very few subjects have good knowledge about PNDT act but most of them responded that sex determination was punishable offence. Majority of the subjects have positive attitude towards female foeticide. Most of the subjects responded that they are preferring for son, and few subjects are ready for sex determination and even for female foeticide. CONCLUSION: Study concluded that female foeticide is against the human rights and has huge impact on the society. Everyone in the society
8. AUTHOR : Sarkar & Dasgupta 2015. **SOURCE AND TITLE:** Gender preference and perception of PNDT: A community based study among ever married women in a rural area of West Bengal **COUNTRY:** India. **VARIABLES:** Gender preference and perception of PNDT **INSTRUMENTS:** Semi-structured questionnaire, interview method. **SAMPLE AND SAMPLING TECHNIQUE:** 96, simple random sampling technique. **DESIGN:** Cross-sectional study. **DURATION:** 2 Months. **FINDINGS:** The study revealed that only few subjects had no gender preferences and most of the subjects replied that at least one son is compulsory in a family. The reasons for preference of male child are security in the old age and carries name of the family. **CONCLUSION:** The study concluded that there is a need for awareness related to female foeticide and attitude change towards male child.

9. **AUTHOR:** Christian, Sonaliya & Garsondiya, 2014 **SOURCE AND TITLE:** Female foeticide in the view of fertile females-A study among suburban pregnant women of Gujarat, India **COUNTRY:** India. **VARIABLES** Female foeticide in the view of fertile females. **INSTRUMENTS:** Structured questionnaire, Interview method. **SAMPLE AND SAMPLING TECHNIQUE:** 200, purposive sampling technique. **DESIGN:** Cross-sectional study. **DURATION:** 6 Months. **FINDINGS:** Majority of the subjects didn’t have birth preferences. But few subjects had preference for son. Many subjects considered son or daughter as God’s gift. Few Subjects considered sex determination as a sin. Most of the subjects were aware that the sex determination is punishable in our country. **CONCLUSION:** The study concluded that most of the subjects have favorable attitude being against to sex determination and female foeticide.

10. **AUTHOR:** Purwar, 2015. **SOURCE AND TITLE:** Gender violence due to female foeticide: Across-sectional study from banda,Uttar Pradesh **COUNTRY:** India. **VARIABLES** Gender violence, female foeticide **INSTRUMENTS:** Structured questionnaire, Interview method. **SAMPLE AND SAMPLING TECHNIQUE:** 100, Random sampling technique. **DESIGN:** Cross-sectional study. **DURATION:** 20 days. **FINDINGS:** Most of the subjects replied that boys carries name of the family, they are compulsory for the funeral activities of last days. Few subjects responded that female foeticide was due to burden of dowry.

**Conclusion**

The Government and NGO’s should take variety of strategies like providing awareness on consequences of this unethical practice and strict legal punishments for the offenders.

**Summary of the findings:**

The available literature refined to get 9 quantitative and 1 qualitative approach.

Three research studies highlighted that preference for the son high in our society with various reasons like security in old age, carries the name and fame of the family and financial security and carry out the last days rituals of the parents and daughters are not preferred due to fear of dowry.

Two research studies reveal that most of the subjects have favorable attitude being against to sex determination and female foeticide.

Four research studies found that people were aware about sex-determination tests and method for sex-determination. The subjects were aware that female foeticide and sex determination is illegal practice and it leads to legal punishment for the offenders (PNDT Act)

One research study revealed that practice of sex determination is most common in literate families compare with illiterate families.

**Importance in education:**

Female foeticide is one of the issue which is against to the human rights. These unethical practices are happening due to lack of awareness in our society. The nursing education system should focus on the providing awareness campaigns to the community and make the nursing graduates as responsible health team member for prevention of this malpractice.

**Limitations:**

- Data search was limited
- Search strategy was refined to gender preferences, female foeticide only
Conclusion

Preference for the son in our society can be changed with the help of behavior change communication and awareness regarding consequences of the female foeticide.

Ethical Clearance- Taken from college research committee, Teerthanker Mahaveer college of nursing, Teerthanker Mahaveer University.

Source of Funding- Self

Conflict of Interest -Nil

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2. Knowledge, Attitude and Practice of Pregnant Women on Gender Preference, Prenatal Sex
15. Purwar C. Gender violence due to female foeticide: A cross-sectional study from banga, Uttar Pradesh. Online International of Medical and Social Sciences.2015, 3(1), 86-92.
Prevalence of Malnutrition and Non communicable disease among South Indian Women: an Urban-Rural Comparison

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Abstract

The aim of this study is to examine the urban rural differentials in the effects of socio economic predictors on underweight and underweight/obesity of ever-married women in South Indian States. The effect of malnutrition and other risk factors on non-communicable diseases is also examined. Nutritional status, socio economic and demographic background of women was obtained from the nationally representative DHS data (NFHS 2015-2016). Multinomial and binary logistic regression was performed in determining the risk factors of malnutrition and examining the effect of malnutrition and associated risk factors on non-communicable diseases. The result revealed that in rural and urban settings, women of age less than 20 years were 2.78(OR=3.78, 95% CI=2.10-6.80) and 0.72(OR=1.72, 95% CI=1.15-2.57) times more likely to be underweight. Women from urban areas were significantly less likely to suffer from anemia (OR=.96, 95% CI=.94-.99) and hypertension (OR .94, 95% CI= .90-.97) than those from urban areas. Women who were categorized as overweight were less likely to suffer from anemia and more likely to suffer from diabetes respectively.

Keywords: Malnutrition, Non Communicable disease, NFHS-4.

Introduction

Adequate nutrition is an essential condition for attaining good health, quality life and stimulating national productivity. The World Health Organization estimated global prevalence of obesity as 400 million in 2005 and the predicted figure for 2015 was 700 million[3]. Illiterate women from rural parts of India having marriage at low ages and low standard of living was more likely to have prevalence of nutritional deficiency.

One of the common problem among women taking improper nutrition is anemia which is a decrease in the total amount of hemoglobin in the blood and may include feeling tired, weakness, breath shortness or a poor ability of daily work routine on the other hand, some non-communicable diseases here (diabetes and hypertension) were more likely to be prevalent among women having overweight or obese and are a result of daily life style among the study participants. Coexistence of diabetes and hypertension frequently, leading to additive increase in the risk of life threatening cardiovascular events.

Diabetes has become the seventh leading attributable risk factor for burden of disease in south Asian countries[2]. The economic and disease burden associated with non-communicable disease puts enormous pressure on unsound health systems in low income countries. Therefore understanding the extent and diagnosis of non-communicable diseases may reveal helps to reduce premature death, disability and household economic shock. A research based on multi countries revealed that people belong to low income countries and with lower economic profile were less likely to receive a timely...
diagnosis and treatment for their non-communicable diseases [1].

The prevalence of malnutrition and non-communicable disease is increasing over the years among Indian women but the rates as well as the effect of covariates may differ across urban-rural settings. The specific objective of this study is to examine whether there are any urban-rural differentials in the effect of risk factors on prevalence of malnutrition (underweight and obesity) among women residing in south states of India. According to the National Family Health Survey report published in December 2017, the frequency of women suffering from hypertension and diabetes are relatively higher in south states as compared to other states areas and also shows a high distribution of anemic women across these states. Therefore, the Models will be fitted to the DHS data (NFHS 2015-16) by filtering in the five south states (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana) and weighting techniques was employed to ensure the correct representativeness for providing a comprehensive picture of nutrition and non-communicable disease for women residing in these states.

**Materials and method**

**Data description**

This study used data from DHS (Demographic and Health Surveys), from NFHS (National Family Health Surveys) data set of year 2015-16. The 2015-16 National Family Health Survey (NFHS-4) is a nationally representative survey with a sample of 628,892 residential households in all the sample households, women of age 15-49 who are usual members of the selected households were interviewed in the survey.

**Dependent and independent variables**

For the measurement of nutritional status, Body mass index is considered as dependent variable and the women under the study areas were categorized as underweight (up to 18.50 kg m–2) as first category, normal (between 18.50 and 24.9 kg m–2) as second category and combining overweight (between 25.0 and 29.9 kg m–2) and obese (30.0 kg m–2 or more) for third category.

The blood glucose measurement for the women was used for considering women as normal and diabetic. The prevalence of anemia is determined based on hemoglobin levels and the subjects were categorized as anemic if the hemoglobin level is below 12 g dl – 1 for non-pregnant and below 11 g dl – 1 for pregnant women otherwise not anemic. Women were considered as hypertensive if their systolic pressure was more than or equal to 140, diastolic pressure was more than or equal to 90 and if they are currently taking a medicine for maintaining their blood pressure.

The independent variables used for this study is based on the existing literature and data availability. Background characteristics of the respondents were re grouped into categories as age ( up to 20, 21-30, 31-40, 41-49 years), age at first cohabitation ( up to 15, 15-17, 18 or above), total children ever born ( 0, 1-2, 3-4, 5 or more), education (illiterate, primary, secondary, higher secondary) and household wealth status( low, middle, high).

**Statistical Analysis**

The NFHS adopted appropriate survey methodology to obtain a representative sample but the final sample does not guarantee a complete representativeness in terms of proportional allocation at strata and cluster levels. To ensure the representativeness of the sample at various levels, sampling weights was calculated separately for each sampling stage and cluster based on sampling probabilities. The design of the survey (stratification and clustering) and sample weights were incorporated into the analyses using svy routines of weighting sample techniques. All the dependent and independent variables considered in the study were categorical. Frequency and graphs were used to show the distribution of prevalence of non-communicable disease among respondents. Multinomial logistic regression technique was employed to estimate the covariates and binary logistic regression models were fitted to estimate the effect of risk factors on non-communicable disease and the effects of the predictor variables on dependent variables

(Nutritional level, anemia, diabetes and hypertension of ever-married women) were estimated by odds ratio (OR) of each category relative to the reference category and separate analyses were performed for respondents from rural and urban areas. All the analyses were performed by SPSS 22 version.
Results

As revealed in figure 1, only 7.6% of urban women were underweight, whereas the percentage of overweight or obese (44%) was higher in urban. However the percentages of women having normal nutritional status were more in rural areas as compared to urban areas.

Table 1: Odds ratios of nutritional status of rural and urban ever-married women by background characteristics

<table>
<thead>
<tr>
<th>Age of respondent at the time of interview (RC 41-49 years)</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight EXP(B) 95% CI</td>
<td>Over weight EXP(B) 95% CI</td>
<td>Under weight EXP(B) 95% CI</td>
</tr>
<tr>
<td>Up to 20 years</td>
<td>3.78*** (2.10-6.80)</td>
<td>.52*** (.41-.88)</td>
</tr>
<tr>
<td>31-40 years</td>
<td>2.13*** (1.35-3.35)</td>
<td>.65*** (.52-.78)</td>
</tr>
<tr>
<td>31-40 years</td>
<td>.76 (.53-1.09)</td>
<td>.89 (.75-1.00)</td>
</tr>
<tr>
<td>Age of respondent at first cohabitation (RC 18+ years)</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Under weight EXP(B) 95% CI</td>
<td>Over weight EXP(B) 95% CI</td>
<td>Under weight EXP(B) 95% CI</td>
</tr>
<tr>
<td>Up to 15 years</td>
<td>.92 (.70-1.23)</td>
<td>.95 (.99-1.34)</td>
</tr>
<tr>
<td>15-17 years</td>
<td>1.22 (.96-1.55)</td>
<td>.90 (.87-1.14)</td>
</tr>
<tr>
<td>Respondent’s level of education (RC higher secondary)</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Under weight EXP(B) 95% CI</td>
<td>Over weight EXP(B) 95% CI</td>
<td>Under weight EXP(B) 95% CI</td>
</tr>
<tr>
<td>Illiterate</td>
<td>.94 (.63-1.40)</td>
<td>1.28** (1.03-1.60)</td>
</tr>
<tr>
<td>Primary</td>
<td>1.10 (.74-1.62)</td>
<td>1.21 (.97-1.50)</td>
</tr>
<tr>
<td>Secondary</td>
<td>.87 (.66-1.14)</td>
<td>1.17** (1.02-1.34)</td>
</tr>
<tr>
<td>Total children ever born (RC 5+)</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Under weight EXP(B) 95% CI</td>
<td>Over weight EXP(B) 95% CI</td>
<td>Under weight EXP(B) 95% CI</td>
</tr>
<tr>
<td>No births</td>
<td>.86 (.41-1.78)</td>
<td>.76 (.51-1.12)</td>
</tr>
<tr>
<td>0-2 births</td>
<td>.68 (.34-1.36)</td>
<td>.71* (.49-1.01)</td>
</tr>
<tr>
<td>3-4 births</td>
<td>.99 (.49-1.98)</td>
<td>.82 (.57-1.17)</td>
</tr>
<tr>
<td>Cohabitation durations (RC 24+)</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Under weight EXP(B) 95% CI</td>
<td>Over weight EXP(B) 95% CI</td>
<td>Under weight EXP(B) 95% CI</td>
</tr>
<tr>
<td>Up to 5 years</td>
<td>.88 (.49-1.58)</td>
<td>.46*** (.34-.61)</td>
</tr>
<tr>
<td>6-13 years</td>
<td>.75 (.45-1.25)</td>
<td>.71** (.57-89)</td>
</tr>
<tr>
<td>14-23 years</td>
<td>.91 (.62-1.34)</td>
<td>1.02 (.86-1.20)</td>
</tr>
<tr>
<td>Household Wealth Index (RC high)</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Under weight EXP(B) 95% CI</td>
<td>Over weight EXP(B) 95% CI</td>
<td>Under weight EXP(B) 95% CI</td>
</tr>
</tbody>
</table>
Cont... Table 1: Odds ratios of nutritional status of rural and urban ever-married women by background characteristics

<table>
<thead>
<tr>
<th>Access to newspaper/ magazine (RC sometimes/more)</th>
<th>Low</th>
<th>Middle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.83*** (1.37-2.45)</td>
<td>1.65*** (1.34-2.03)</td>
<td></td>
</tr>
<tr>
<td>.25*** (.19-.32)</td>
<td>.59*** (.51-.68)</td>
<td></td>
</tr>
<tr>
<td>2.05*** (1.75-2.41)</td>
<td>1.49*** (1.29-1.73)</td>
<td></td>
</tr>
<tr>
<td>.34*** (.30-.39)</td>
<td>.63*** (.57-.70)</td>
<td></td>
</tr>
</tbody>
</table>

| Access to Radio (RC sometimes/more)              |
| 1.43*** (1.16-1.75)                             |
| .78*** (.70-.87)                                |
| 1.06 (.92-1.23)                                 |
| 1.09 (.98-1.23)                                 |

| Access to TV (RC sometimes/more)                |
| 1.63*** (1.20-2.21)                            |
| .85 (.67-1.07)                                  |
| 1.02 (.84-1.24)                                |
| 1.09 (.81-1.13)                                |
| 1.09 (.80-1.03)                                |

RC stands for reference category. Figures in parentheses indicate 95% confidence interval of odds ratio; ***P<0.01, **P<0.05, *P<0.10.

Figure 2: Percentages of women with Anemia by nutritional status.

Figure 3: Percentages of women with Diabetes by nutritional status.

Figure 4: Percentages of women with Hypertension by nutritional status.
The adjusted ORs of being underweight and overweight with 95% Confidence Interval for various categories of predictor variables (with respect to the normal as reference category) are presented in Table 1 and separate models are fitted for urban and rural areas. Women of lesser age were more likely to be underweight compared to women of higher ages 41-49 as reference category both in urban and rural settings. Prevalence of being underweight was more prominent in rural than in urban areas. However, Age of respondent at the time of cohabitation in the prevalence of obesity or overweight of women were not statistically significant. In rural areas, illiterate women, women with primary level of education and with secondary level of education were .59 (OR = 1.59; CI = 1.16-2.17), .16 (OR = 1.16; CI = .85-1.59) and 0.20 (OR = 1.20, CI = .93-1.55) times more likely to be underweight than those with above secondary education.

Household economic status showed significant effects in both urban and rural settings, women who were low and middle economic status were more likely to be underweight and accordingly less likely to be overweight or obese than those who were rich, those from urban households categorized as poor and middle wealth were 0.83 (OR = 1.83; CI = 1.37-2.45) and 0.65 (OR = 1.65; CI = 1.34-2.03) times, respectively, more likely to be underweight although the figures for rural setting are 1.05 (OR = 2.05; CI = 1.75-2.41) and 0.49 (OR = 1.49; CI = 1.29–1.73), respectively. The percentage of women with various non-communicable diseases by nutritional status has been shown in Figure 2, 3 and 4 and revealed that anemia was more prevalent among underweight women whereas other non-communicable disease such as hypertension and diabetes are more prevalent among overweight women.

Table 2: Odds ratios of nutritional status of rural and urban ever-married women by background characteristics

<table>
<thead>
<tr>
<th></th>
<th>Anemia</th>
<th>Hypertension</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EXP (β)</td>
<td>95% CI</td>
<td>EXP (β)</td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(RC Rural)</td>
<td>.96**</td>
<td>(.94-.99)</td>
<td>.94**</td>
</tr>
<tr>
<td>Wealth status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(RC poor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>.91***</td>
<td>(.87-.94)</td>
<td>.93**</td>
</tr>
<tr>
<td>Rich</td>
<td>.73***</td>
<td>(.70-.76)</td>
<td>.90**</td>
</tr>
<tr>
<td>Nutritional level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(RC Underweight)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>.76***</td>
<td>(.73-.79)</td>
<td>1.68***</td>
</tr>
<tr>
<td>Overweight</td>
<td>.67***</td>
<td>(.64-.69)</td>
<td>4.02***</td>
</tr>
</tbody>
</table>

RC stands for reference category. Figures in parentheses indicate 95% confidence interval of odds ratio; ***P⩽0.01, **0.01oP⩽0.05, *0.05oP⩽0.10.

The adjusted odds ratios with 95% confidence intervals of non-communicable diseases among ever married women with three set of predictor variables (Place of residence, Household wealth status and Nutritional level) with respect to reference category are presented on table 2. Household wealth also showed a significant association with non-communicable disease, such that women from middle and rich wealth household categories were less likely to suffer from anemia with respect to those from poor households but the association is reversed for diabetes as women from middle wealth status were 0.04 (OR = 1.04; CI = 0.93–1.17) and rich wealth status were 0.41 (OR = 1.41; CI = 1.27–1.56) times more likely to suffer from diabetes as compared to those from poor wealth status. Finally, nutrition also showed a highly significant association with all non-communicable diseases, such that women in normal (OR = 0.76; CI = 0.73–0.79) or overweight (OR = 0.67; CI=0.64 –0.69) were less likely to suffer from anemia with those who were underweight. It can be stated the risk of having diabetes and hypertension increases as the weight increases. The same pattern holds for hypertension, where women in normal or overweight categories were 0.68 (OR = 1.68; CI = 1.56–1.81) and up to 3.02 (OR = 4.02; CI = 3.73–4.34) times more likely to
suffer from hypertension with respect to those who were underweight.

**Discussion**

For the overall population, higher percentages of underweight women are from rural settings whereas higher percentage of overweight women is from urban settings. Educational status of their husband showed more significant effect on nutritional status of women than their own educational status. Women from middle and rich wealth status were less likely to be underweight and more likely to be overweight in both area of residence. This may be due to reason as the poor woman does not afford sufficient and proper food to maintain their nutritional level, lack of knowledge may also result in adverse nutritional outcome. In terms of non-communicable diseases, underweight women were more likely to suffer from anemia and less likely to suffer from diabetes and hypertension and this may be due to the fact that both anemia and overweight share a common risk factor in terms of food intake and improper nutrition. The main implication of this paper is that authorities should develop special programs for educating young women living in rural areas and urban slums regarding alternative low-cost balanced food options which may help reduce underweight and anemia. Women of higher age and higher economic status are more vulnerable to be overweight which proves to be high risk for diabetes and hypertension so these study participants must be targeted to discourage the consumption of junk food and to encourage physical activity.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** The data used in this study obtained from MEASURE DHS Archive. The data were conducted under the stewardship of the Ministry of Health and Family Welfare (MoHFW), Government of India. MoHFW designated the International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for this survey. The authors are grateful to Measure DHS for providing permission to use the 2015-16 National family health survey (NFHS-4) data.

**References**


Analysis of Functional Efficiency of Quadriceps in Patients Recovered from Symptoms of Osteoarthritis of Knee Joint

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¹Intern, ²Professor, Faculty of Physiotherapy, ³Assistant Professor, Faculty of Physiology, KIMSDU, ⁴Dean, Faculty of Physiotherapy, Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India.

Abstract

Objective: To compare the extensor muscle strength (quadriceps) between normal subjects and subjects who have recovered from osteoarthritis of knee (grade 1 and 2).

Method: A total of 46 subjects were screened as per inclusion and exclusion criteria and they were briefed about the study and outcome measures. Informed consent was taken from the subjects. Subjects were selected by the convenient sampling method. The subjects were then divided to the respective groups. Group A included all the subjects who were recovered from Osteoarthritis of knee (grade 1 and 2) and group B included all the normal individuals of same age group and same geographical area. The efficiency of the quadriceps muscle was checked with the mean amplitude values of EMG, and the disability index pre and post test was checked with the help of WOMAC scale. Subjects for group A was selected with the help of radiological findings of knee, history and symptoms.

Conclusion: The study concludes that the progression of osteoarthritis of the knee can be controlled by maintaining muscle power and concentrating on the other joints in addition to taking caution towards stress factors on activity. The mean amplitude of quadriceps muscle recorded with surface EMG in osteoarthritis subjects post recovery of symptoms (after physiotherapy treatment) was similar to the normal subjects of same age group.

Keywords: Osteoarthritis, knee, physiotherapy treatment, quadriceps, electromyography, functional efficiency, WOMAC.

Introduction

More studies suggest that treatment directed towards increasing the muscle function in those with symptomatic osteoarthritis can produce favorable results. For patients with osteoarthritis, where any surgical procedure is not advisable or where there is no concern. It is a challenge, to show progress irrespective of multiple predisposing factors leading to progressive osteoarthritis joint damage, so at all possible stages the research is mandatory to work with patients with limited ability.

Magnitude of economy, social cost of the disabling condition, restricts the patients to follow safe exercises procedures on their own.

The precise causes and factors influencing osteoarthritis is not yet understood or evident. The extensor muscle in particular have great demand in withstand stresses created by damaged joint structures in addition to others tissues. Failure to generate required muscular force, create a fall or severe painful condition'

Goals of therapeutic exercises in osteoarthritis is mostly related to activation and strengthening the muscles surrounding knee joint to achieve, any particular goals.

The goals are maintained with range of motion with sufficient functional activities; maintaining sufficient muscle strength to the patient level of function; improve
joint stability and decreases biomechanical stress upon joint; to improve endurance of all the functional activities, to achieve efficient gait pattern and decrease pain which is long term and short term goals. Isometrics, isotonic and isokinetic exercises are used more or less equally, depends upon joint stability. Post exercises should also be considered in treatment for osteoarthritis. So individuals program, for each patient is to be scheduled to have maximum benefit with pain relief. So physiological study on quadriceps has been done using surface EMG. Physiotherapy prescription for joint protection needs to be done with proper analysis for muscle function inspite of avoiding alteration/recommending non weight bearing, partial weight bearing/aquatic/promoting till tolerance level/progressing with individual physical performance should not be adopted with approximation.  

The purpose of this study is to check the state or quality of the quadriceps muscle of being efficient in the patients who have recovered from osteoarthritis of knee as compared to the individuals who had no history of osteoarthritis of knee.

**Method**

- **Study design**: observational study
- **Study type**: post test (1 time)
- **Sampling method**: Convenient sampling
- **Study Duration**: 3 months
- **Sample size**: 46
- **Place of study**: Karad.

Sampling methods: After baseline assessment, the patients were divided into 2 groups, Group A and Group B.

**Group A**: 23 subjects recovered from symptoms of OA grade 1 and grade 2 and just after physiotherapy treatment.

**Group B**: 23 normal individuals with similar age group from same geographical area and health/physical status.

**Materials**:

- Data Collection sheet
- Consent form
- Pen
- Pencil
- EMG machine
- Surface electrodes

**Outcome measures**:

The Western Ontario and McMaster Universities Osteoarthritis Index. (WOMAC):

Electromyography (EMG):

**Procedure**:

This was an observational study to check the quadriceps muscle efficiency in patients who have recovered from symptoms of osteoarthritis of knee grade 1 and 2, considering symptoms control on discharge of OPD treatments.

Subjects were explained about the procedure of the study. All the patients who had recovered from symptoms of osteoarthritis of knee grade 1 and 2 were included in group A and all normal individuals who had no history of osteoarthritis were included in group B.

**Group A**: 23 patients who had recovered from symptoms of osteoarthritis of knee joint grade 1 and 2 and subjects who got discharged from OPD were in group A. They were assessed for efficiency of quadriceps muscle with the help of surface electrode EMG (completely non invasive procedure), and further assessed with WOMAC knee disability index.

**Group B**: 23 normal individuals with no history of osteoarthritis, symptoms, and belong to same age group appropriately who had been randomly selected. They were assessed with the same procedure as group A. Further the EMG outcomes of both the groups were compared.

**Outcome measures**:

WOMAC score of group A subjects was assessed compared using the pre and post test WOMAC score values. It was not considered for group B subjects as they are normal.

EMG recording: The efficiency of the quadriceps muscle was checked by electromyography (EMG), the recording of the EMG was done by using surface
Results and statistics

Unpaired t test was used for statistical analysis of pre and post test within Group A subjects with osteoarthritis of knee.

Mann whitney’s test was used for comparing both groups and statistical analysis. Group A (subjects with osteoarthritis) and Group B (normal individuals).

Electromyography:

The mean amplitude was taken into consideration to check the efficiency of quadriceps muscle.

46 subjects participated in the study belonging to similar age group and geographical areas restricted to one place.

23 patients who had recovered from symptoms of osteoarthritis of knee joint grade 1 and 2 / discharged from OPD of physiotherapy during 1st and 2nd day were in group A.

And 23 subjects who are normal and had no history of osteoarthritis of knee were in group B.

Then the mean amplitude values of EMG of both the groups were compared.

<table>
<thead>
<tr>
<th>Group</th>
<th>MEAN ± SD</th>
<th>“P” value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A</td>
<td>150.10 ± 4.069</td>
<td>0.0102</td>
<td>SIGNIFICANT.</td>
</tr>
<tr>
<td>GROUP B</td>
<td>153.43 ± 3.745</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistical analysis between mean of EMG values (mean amplitude) of quadriceps muscles in group A (subjects recovered from symptoms of osteoarthritis) was 150.10 ± 4.069 whereas, the analysis between mean of EMG values (mean amplitude) of quadriceps muscles in group B (normal subjects) was 153.43±3.745. Intra group analysis of EMG mean amplitude has shown statistically significant. This was done by using Mann Whitney’s test. (“P” value = 0.0102)

02) WOMAC SCORING:

The WOMAC score was taken pre and post test in group A.

Group A included patients who were recovered from symptoms of osteoarthritis and subjects who got discharged from OPD.

<table>
<thead>
<tr>
<th>Group</th>
<th>MEAN ± SD</th>
<th>“P” value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE TEST</td>
<td>31.76 ± 6.854</td>
<td>0.0030</td>
<td>VERY SIGNIFICANT.</td>
</tr>
<tr>
<td>POST TEST</td>
<td>26.108 ± 3.996</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistical analysis between pre and post test for group A (subjects who were recovered from symptoms of osteoarthritis) were taken. Pre test mean of WOMAC score was 31.76 ± 6.854 and the post test mean of WOMAC score was 26.108 ± 3.996. Inter group analysis of WOMAC score had shown very significant. This was done by unpaired t test. (“P” Value 0.0030).
Discussion

The study subjects with osteoarthritis of knee have presented with the following characteristics which was shared by the therapist undergone treatment for study subjects.

Muscle fatigue was predominant in osteoarthritis limb. Subjects had shown more trick movements during walking and other activities in the stress of affected limb was taken over by hip and trunk muscles and foot, so it has shown pain, tiredness and weakness. Muscle degeneration and atrophy was found in subjects with major knee deformities so patients with knee deformities with valgus and varus deformities were not considered for study.

The study has given implications regarding early identification of osteoporosis this is evident from the subjects with reference to the exercises performance and progression which have delayed the process of strengthening. In case of inflammatory changes which have influence the muscle strength was taken cared during treatment process.

ELECTROMYOGRAPHY

The noninvasive method using surface EMG sensors were used in the study by placing them on the skin above the muscle of interest as per the physiological response in OA knee patients.

Considering easy applicability eradicating risk of infection and group motor unit pattern can be studied by application over the maximum girth of Quadriceps muscle the preferred site of quadriceps was located at the maximum girth thus the study was undertaken in the similar pattern to quantify the mean amplitude changes with the observation upon discharge patients recovered from symptoms.

The study has ruled out some practical issues regarding skin fold thickness and its relationship to EMG observation.

The surface EMG can be used as an indicator for muscle fatigue during isometric sub maximal contractions, muscle fatigue I accompanied by decrease in motor unit firing rate and conduction velocity as a major for maintenance and safe progression for activities the mean amplitude was observe.

In the above study the EMG results shows that the mean amplitude of group A almost reached to the mean amplitude of group B. The mean amplitude results show that the efficiency of quadriceps muscle in the patients who have recovered from the symptoms almost reaches to the level of normal individuals after symptoms control.

WOMAC

Group A patients have been assessed with WOMAC self reporting multi dimensional questioner to assess pain, stiffness and physical functional disability. 2 times at the start of session and at the end while discharge for easy approach the questions have been translated in their mother tongue and outcome recorded. The study has shown significant results in all 3 categories pain, stiffness, function) as the subjects were homogeneous and without ay deformities of the knee. (P value less than 0.01). 70 percent of the subjects were females and both genders emotional states were similar and it has direct influence upon pain and function.

Intra group analysis for mean amplitude of EMG revealed statically significant. Group A and Group B values of mean amplitude of EMG was took. This was done by using Mann Whitney’s test. For group A mean ±SD was 150.10 ± 4.069 and for group B mean ± SD was 153.43± 3.745 (“P” value = 0.0102)

Inter group analysis for WOMAC score for group A(pre and post test) was done by unpaired t test. Statistically it is revealed as very significant. Pre test mean ± SD was 31.76 ± 6.854 and post test mean ± SD was 26.108±3.996. (“P” value = 0.0030)

The study has shown clinically significant changes in WOMAC scale scoring and Mean amplitude of EMG.

This mean amplitude of EMG findings suggest that the functional efficiency of quadriceps muscle in patients recovered from osteoarthritis (after physiotherapy treatment) reaches to the normal individuals functional efficiency of quadriceps muscle.

Conclusion

The study concludes that the progression of osteoarthritis of the knee can be controlled by maintaining muscle power and concentrating on the other joints in addition to taking caution towards stress factors on activity. The mean amplitude of quadriceps muscle recorded with surface EMG in osteoarthritis
subjects post recovery of symptoms (after physiotherapy treatment) was similar to the normal subjects of same age group.

**Conflict on Interest:** There were no conflicts on interest in this study.

**Funding:** This study was fund by Krishna Institute of Medical Sciences Deemed to be University, Karad.

**Ethical Clearance:** The study was approved by the institutional ethics committee of KIMSDU. The trail was registered with Clinical Registry of India with no: CTRI/2018/01/011545.

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Effectiveness of Multimodal Sensory Stimulation in Improving Motor Outcomes of Preterm Infants

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¹Postgraduate, ²Associate Professor, ³Professor & Principal, Faculty of Physiotherapy, Sri Ramachandra Medical College & Research Institute, Porur, Chennai, Tamil Nadu

Abstract

Background: Preterm birth is defined as babies born alive at less than 37 weeks of gestation. Due to the lack of the in-vitro environment and their exposure to harmful environment of the NICU has led to the preterm infants having a long term disability. The awareness of environmental factors on development gave rise to the formation of early intervention program. Multimodal interventional strategies which primarily use touch, vision, sound, and movement stimulation has shown to have an immediate physiological effect. However, the long term effect of multimodal stimulation with proper dosage in improving the motor outcomes is not well established.

Aim: The current study aimed to analyse the effectiveness of multimodal sensory stimulation in improving the motor outcomes of the preterm infant at one month of corrected age

Methodology: A quasi-experimental study (pre and post test design) was conducted in Sri Ramachandra Medical centre and Hospital. Preterm infants with GA of 28-36 weeks, who were medically stable and referred for early stimulation, were recruited in the study by convenient sampling. Baseline parameters were assessed using Hammersmith neurological scale, after which the mothers were counselled about age appropriate milestone development. They were then taught to perform touch, kinaesthetic, vision, auditory, vestibular and proprioceptive therapy under the guidance of the therapist. On discharge, a pamphlet was given to the mothers and were educated to continue the therapy. At one month of corrected age, the preterm infants were reassessed using HNE.

Results: The result shows that mean pre-therapy and post-therapy values of the preterm group had a significant improvement.

Conclusion: Multimodal stimulation is effective in improving the motor outcomes of the preterm infants, at one month of corrected age.

Keywords: multimodal sensory stimulation, preterm infants, hammersmith neurological assessment scale, KMC

Introduction or Background

WHO defined preterm birth as babies born alive at less than 37 completed weeks of gestation. According to the millennium developmental goals indicator the region with the highest incidence rate of preterm birth (13.4% of all preterm birth) is southern and south-east Asia and India ranks first in yearly prevalence of preterm birth among the South Asian countries¹.

Advances in the care of preterm babies has lead to decrease in their mortality rate and increased their survival rate. Preterm babies once survived truly possess a global problem in low-income countries such as south Asia¹.
During normal embryological development, developing brain is highly plastic. The fetal development in the intra uterine environment provides an optimal surrounding for the formation and maturation of the synapses².

Myelination of the CNS starts from 14 weeks of gestation and reaches a peak from 25-37 weeks. Myelination of the thalamic structure, cortical structure and optic radiation occurs at 25 weeks, 35 weeks and 35 weeks respectively³.

Gyrification process spans from 10-28 weeks of gestation and occurs in a hierarchical manner, with the primary sulci appearing first followed by the secondary and tertiary gyri. Due to gyriification and formation of sulcus, the fetal brain develops from the lissencephalic structure to that of an adult brain with sulcus and gyri. Thereby the surface area of the cortical grey matter increases, and more neurons gets packed in the cortex, this increases the ability of the cortex to process information⁴,⁵.

This process of normal development is disturbed in the case of preterm infant, who are born before 40 weeks of gestation, and are further worsened by the early exposure of the preterm to the harmful environment of NICU. As a result, the preterm infants are subjected to long term morbidities⁶.

21% of preterm infants born before 32 weeks of gestation have severe white matter injury. Furthermore, the reduction in size of the corpus callosum of the preterm infant positively correlates with the development of cerebral palsy in their later age⁷,⁸,⁹.

Due to perinatal illness of prematurity like lung infections and bronchopulmonary dysplasia 17-23% of very preterm and 12% of late preterm infants suffer from neurodevelopmental impairments in terms of impaired upper and lower limb functions, lack of independent ambulation and vision and hearing loss at preschool age¹⁰,¹¹.

These studies suggest that the infants born as very and late preterm are having extended developmental, behavioural problems which needs special care and educational services to address these morbidities.

The initial experiences which the infants gain, will pave way for the appropriate development of the synapse².

However, the preterm infants are kept in the NICU in their initial days of life. This increases their survival and also exposes them to the loud and harmful environment of the NICU, this develop compensatory physiological responses, is not ideal for the neurodevelopmental need and may become permanent to cause delirious long term effect¹².

The awareness of environmental factors on development gave rise to the formation of early intervention program, which are aimed at providing an optimal environment by removing environmental barriers to promote the developmental needs of the maturing brain¹³.

The term ‘early intervention’ designates educational strategies and neuroprotection strategies aimed at enhancing brain development by enhancing cerebral plasticity and neuro-protection at improving the environmental and neurological experiences of the preterm infant during the critical period of development, thereby improving the plasticity of the developing brain to promote normal development and prevent disabilities¹⁴,¹⁵.

Early intervention which is started early before 40 weeks of postmenstrual age, prior to any structural changes to the brain is most effective in improving the cognitive and behavioral outcome in preterm infants².

The neurological system receives input from all the sensory pathways such as touch, vision, sound, and movement to explore the possibilities of neural connection and forms new synapses, which can be further trained to produce proper developmental outcomes¹⁶.

Successful implementation of this multimodal sensory stimulation as an early intervention strategy requires full participation from parents¹⁷.

Studies which uses multimodal sensory stimulation as intervention strategies are large in number, all have shown to improve cognitive function but motor outcome were not well established, also, effective component for a successful intervention to improve motor outcome with appropriate dosage of intervention were not established¹⁸.

Early detection of any delay in motor development is always beneficial, but all the studies conducted so far
in assessing the effect of early sensory stimulation in improving cognitive outcomes are assessed at 40 weeks of postmenopausal age, 3rd, 6th, 9th, and 12th month of corrected age. A study which assess the developmental improvement, as early as one month of corrected age is not established.

Hence, analysing the level of development in motor outcomes achieved as a result of a dosed multimodal stimulus with different combination in improving the motor outcomes at one month of corrected age forms the basis of this study.

**Material and Method**

This quasi-experimental study (pre-test and post-test design) involved subjects who were preterm infants of GA 28-37 weeks to analyze the effect of multimodal sensory stimulation in improving their motor outcomes at one month of corrected age.

Subjects were recruited from Neonatal ICU of Sri Ramachandra Medical Center and Hospital. 26 preterm infants with the gestational age of 28-36 weeks, who were medically stable and referred for early stimulation, were included in the study using convenient sampling. Infants who were extremely preterm (<27 or 28 weeks), infants with congenital deformities, infants who underwent major surgeries, infants who were medically unstable and with mechanical ventilator support were excluded.

Duration of the study was from the day the multimodal stimulation therapy was initiated till one month of corrected age.

**Procedure:**

Informed consent was obtained from mother. Included preterm infants were assessed for the baseline parameters of tone, reflexes, movement and behaviour using the hammersmith neurological assessment scale.

After the initial assessment, the mothers of the preterm infants were counselled about age appropriate milestone development and were taught techniques of multimodal early stimulation (provided by the mother under the guidance of the physiotherapist).

The early multimodal stimulation exercise program was started from the CALMING INTERACTION IN ISOLETTE:

<table>
<thead>
<tr>
<th>Visual stimulation</th>
<th>Using Black and white objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tactile and kinaesthetic stimulation</td>
<td>Firm touch therapy, Positioning infant in prone lying, Movement therapy</td>
</tr>
<tr>
<td>Auditory stimulation</td>
<td>Mothers voice</td>
</tr>
</tbody>
</table>

**CALMING CYCLE:**

Once the infant was allowed be removed from the isolette, calming cycle is initiated.

<table>
<thead>
<tr>
<th>Vestibular and visual stimulation</th>
<th>Holding the baby in en face position and gently rocking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kangaroo Mother Care</td>
<td>30-60 minutes</td>
</tr>
<tr>
<td>Proprioceptive stimulation</td>
<td>Positioning of infants in supine, side lying and prone lying and to change each position for every 4 hours</td>
</tr>
</tbody>
</table>

During discharge, the mothers were provided with a pamphlet about the therapy and were asked to continue therapy at home.

**Post-therapy assessment:**

At one month of corrected age, infants in the preterm group were assessed using HNE.
Findings

Table 1: DEMOGRAPHIC DATA

<table>
<thead>
<tr>
<th>GENDER n (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>14 (53)</td>
</tr>
<tr>
<td>FEMALE</td>
<td>12 (46)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of preterm n (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very preterm</td>
<td>9 (34)</td>
</tr>
<tr>
<td>Late preterm</td>
<td>17 (65)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (mean days, SD)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very preterm</td>
<td>14.49 (15.49)</td>
</tr>
<tr>
<td>Late preterm</td>
<td>10.3 (8.83)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Birth Weight (mean grams, SD)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very preterm</td>
<td>1105 (263.59)</td>
</tr>
<tr>
<td>Late preterm</td>
<td>1722.77 (502.56)</td>
</tr>
</tbody>
</table>

The pre-therapy and post-therapy score of the preterm group was statistically analyzed using the Wilcoxon signed rank test, to establish the effectiveness of multimodal stimulation in improving the motor development of the preterm infants.

All statistical analysis was performed using the software SPSS version 17.0.

There is a significant improvement in the motor outcome of the preterm infant from baseline to one month of corrected age (p < 0.001).

Table 2: Analysis of total developmental score of pre-therapy and post-therapy of the preterm group

<table>
<thead>
<tr>
<th>Preterm Group Total Score</th>
<th>Mean Rank</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-THERAPY</td>
<td>14.13</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>POST-THERAPY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n = 26, p ≤0.05, Wilcoxon signed rank test

This significance can be contributed to the fact that this treatment model was started early from birth till one of corrected age, a period of time which is considered as critical period, were the systems undergo extensive transition from uterine environment to the external environment. Furthermore, from GA of 34-40 weeks synaptogenesis and myelination is at its peak, during which 40,000 synapses are formed every second and myelination of precentral, postcentral, optic radiation and acoustic radiation occurs during this stage. So multimodal sensory stimulation which has all the components of touch and kinesthetic, auditory stimulation and proprioception in proper dosage at this period of GA could have contributed to the improvement of motor outcomes.

The role of parents in providing comfort and care to the neonate who is getting adjusted to the extra-uterine environment helps in rapid improvement of physiological and psychological development. This study uses active participation of the parent in performing the therapy. Furthermore once the neonate is allowed to remove from the isolette KMC is initiated, the effectiveness of KMC is already been well established. These factors could have contributed to the significant development which was observed in this study.

These findings suggest that the protocol used in this study which follows tactile, vision, kinaesthetic, proprioception, and vestibular stimulation provided by the parent under the guidance of the parents and initiated as soon from the isolette and continued till one month of corrected age is an effective protocol in improving the total motor outcomes of the preterm infants at one month.

Further analysis maybe required to find the effect of this multimodal stimulation program in motor development in later stages.

Conclusion

The conclusion of the study is that the multimodal sensory stimulation of the preterm infants seem to be effective in improving the motor outcomes of these infants at one month of corrected age. The data from this study will contribute to the literature by providing a protocol of multimodal stimulation which is dosed and easy to apply. Also comparison of the preterm and full term development at one month of age will help the therapist in determining the optimal development which is to be attained by the preterm infant at that age point.
Conflict of Interest – Nil

Source of Funding – Self Funded

Ethical Clearance – Taken

References


Violence against Doctor is a Threat in India: A Study in a Tertiary Care Institution

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Abstract

Background: Violence at work place is defined as an act of aggression, physical assault, or threatening behavior that occurs in a work setting and causes physical or emotional harm to an employee.1 In India, because of increasing burden of population and shortage of doctors, there is only one government allopathic doctor to look after 10,189 people and only one government hospital for every 90,340 population. Indian Medical Association (IMA) published a report which shows that nearly 75% of doctors in their careers have faced physical or threat violence at some point. Also, one in four MBBS, MD, DM, MCh. doctors have faced allegations of medical negligence in courts and consumer forums. 88% MBBS and specialist doctors have faced anger or violence of patients or relatives in their professional career at least once.

Methodology: The study was cross-sectional in design and carried out in a tertiary care institution in Haryana. The study recruited 300 residents working in the accident and emergency unit, intensive care unit, operation theatres and trauma centre of the institute.

Results: The prevalence of violence against doctors in the present study was come out to be 75.6% and maximum violence was faced by male resident i.e 71.5%. The relationship between gender and place of violence among residents which was found statistically significant.

Conclusion and Recommendations: Workplace violence in any form and in any setting is unacceptable. The study recommended that there should be enhanced security system at government hospitals for the delivery of safe, effective and truly universal health care in the long term.

Keywords: Violence, Gender, Residents, Doctor, Hospital

Background

Violence at work place is defined as an act of aggression, physical assault, or threatening behavior that occurs in a work setting and causes physical or emotional harm to an employee.1 In India, because of increasing burden of population and shortage of doctors, there is only one government allopathic doctor to look after 10,189 people and only one government hospital for every 90,340 population. India being a developing country where 30% population living in below poverty line, accounts for over half of the estimated 100 million people which is pushed into poverty worldwide every year due to high out-of-pocket expenses on healthcare, that’s why more and more people are seeking healthcare services in the government hospital. Lack of infrastructure, facilities and staffs in government hospitals frequently come across as causes of violence against health care providers.2

Indian Medical Association (IMA) published a report which shows that nearly 75% of doctors in their careers have faced physical or threat violence at some point. Also, one in four MBBS, MD, DM, MCh. doctors have faced allegations of medical negligence in courts and consumer forums. 88% MBBS and specialist doctors have faced anger or violence of patients or relatives in their professional career at least once. Similarly, Deyl S had also reported in his study that over 75% of doctors have faced violence at their workplaces.3
According to WHO, 8% to 38% of health care functionaries said that they faced physical or other violence in their careers and common violence are kicks, scratches, bites and spitting which are perpetrated by patients or their relative. Violence against health care workers is unacceptable. It’s not only impacts on the psychological and physical well-being of health-care workers, but it also affects the motivation of their job and this violence compromises the quality of patient care and puts health-care provision at risk.\textsuperscript{4} A report published in America where it was reported that in nineties, more 100 healthcare providers in the hospital died as a result of violence.\textsuperscript{5} British Medical Association revealed that one-third respondents had been a victim of verbal or physical attack in the year 2008.\textsuperscript{6} Chinese doctors are also frequently the victims of violence.\textsuperscript{7} There are several factors which trigger these violences. These are poor infrastructure at government hospitals, poor communication between doctors and patients, lack of faith in doctors and judicial process, rising cost of healthcare and so forth. National newspapers are regularly reporting that doctors are being daily verbally abused, assaulted, manhandled and even killed by the patient’s relatives. Dissatisfaction of patient is one of the major causes that perpetrators agitated friends and their relatives. The most common settings for such violences are in accident and emergency units, pediatrics care unit, intensive care unit, and post-surgical wards.\textsuperscript{8} In Haryana, no such type of study has ever been conducted on incidence of violence against doctors, therefore the present study was planned with the objective to find out incidence and determinants of violence against the doctors in a tertiary care institution of Haryana.

Material and Method: The study was cross sectional study in design and carried out from November 2017 to January 2018 at one of the premier institutes of Haryana, Pt. B. D. Sharma PGIMS, Rohtak which is a tertiary care institution having 1700 beds. This is a teaching institute having 200 MBBS seats, 145 MD & Diploma students, 06 MCh, 02 DM seats per year and 250 faculty members. This tertiary care institution is providing health care services to an average of 4000-5000 patients daily and 300-400 accident and emergency cases. The previous study reported that most of violences reported from accident and emergency unit, intensive care unit, operation theatres and trauma centre that’s why this study recruited all residents working in this areas.\textsuperscript{8}

The investigator contacted personally with the subjects and informed written consent was sought. Those subjects who gave willingness were included in the study. The objective and nature of the study was explained before starting the study. The assurance about the confidentiality of the information was given to the residents. Interview was started with general discussion to build up a rapport with respondents and to gain their confidence. A pre-tested semi-structured interview schedule was administered to know incidence of violence against study subjects and the responses were recorded by the investigator himself. The questionnaire included name, age, sex, place of working, types of violence and factors responsible for this violence etc. The data was analyzed by applying percentages and proportions for different parameters.

Observations

Table-1 Characteristics of study subjects (n=300)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Characteristics</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>196 (65)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>104 (35)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 30 years</td>
<td></td>
<td>229 (76)</td>
</tr>
<tr>
<td>&gt; 30 years</td>
<td></td>
<td>71 (24)</td>
</tr>
<tr>
<td>Place of working</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accident and emergency unit</td>
<td></td>
<td>140 (47)</td>
</tr>
<tr>
<td>Pediatrics unit</td>
<td></td>
<td>24 (8)</td>
</tr>
<tr>
<td>Intensive care unit</td>
<td></td>
<td>12 (4)</td>
</tr>
<tr>
<td>Trauma centre</td>
<td></td>
<td>88 (29)</td>
</tr>
<tr>
<td>Obstetric and gynecology unit</td>
<td></td>
<td>36 (12)</td>
</tr>
<tr>
<td>Year of experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 3 years</td>
<td></td>
<td>249 (83)</td>
</tr>
<tr>
<td>&gt;3 years</td>
<td></td>
<td>51 (17)</td>
</tr>
</tbody>
</table>

The study recruited 300 junior residents of a tertiary care institution and found that 196/300 (65%) were male residents and rest (35%) were female residents. Majority of residents were aged below 30 years with mean of study participants being 21.3 years. The study was carried out among residents working in Accident and Emergency unit (47%) followed by Trauma centre.
The prevalence of violence against doctors in the present study was found to be 75.6% (197/300). Out of total violence faced by doctors, maximum violence was faced by male resident i.e. 71.5%. Majority (71.7%) of doctors faced verbal violence, 36 (17.2%) doctors faced physical violence and 20 residents (10.1%) faced threats from patients relative or friends. Majority of doctors didn’t know the doctor protection law and only 8.5% doctors who faced the violence didn’t lodge the First Information Report (FIR) in police station.

All residents suggested that strict legal steps should be taken by government. 83.5% of resident said that doctors should not be overburdened with their work and 78% doctors suggested that valid consent should be taken before treatment. Majority (95%) of doctors said that there should be installation of CCTV cameras in institution, 81% doctors suggested that entry of patient’s relative or friend in the hospital should be restricted. (Table-2)

Table-2 Distribution of residents according to violence and their suggestion for prevention (n=197)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Parameters</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sex wise violence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>141 (71.5)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>56 (28.5)</td>
</tr>
<tr>
<td>2.</td>
<td>Types of violence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verbal</td>
<td>141 (71.5)</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
<td>36 (18.4)</td>
</tr>
<tr>
<td></td>
<td>Threat</td>
<td>20 (10.1)</td>
</tr>
<tr>
<td>3.</td>
<td>Awareness about doctor protection act</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>26 (13)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>171 (87)</td>
</tr>
<tr>
<td>4.</td>
<td>FIR lodged</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>17 (8.5)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>180 (91.5)</td>
</tr>
</tbody>
</table>

Table-3 Gender wise association of violence among doctors (n=197)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Parameters</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Type of violence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verbal</td>
<td>87 (61.7)</td>
<td>54 (38.3)</td>
<td>141 (71.7)</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
<td>36 (100)</td>
<td>00 (00)</td>
<td>36 (18.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threat</td>
<td>18 (90)</td>
<td>02 (10)</td>
<td>20 (10.1)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Place of incidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accident and emergency unit</td>
<td>49 (86)</td>
<td>38 (14)</td>
<td>87 (44.2)</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>92 (65.7)</td>
<td>18 (34.5)</td>
<td>110 (55.8)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Year of experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 3 years</td>
<td>131 (66.4)</td>
<td>53 (33.6)</td>
<td>184 (93.4)</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>&gt; 3 years</td>
<td>10 (77)</td>
<td>05 (23)</td>
<td>13 (6.6)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 shows the gender-wise association of violence among doctors and found that the association between gender and type of violence was statistically significant (p<0.001). The study also studied the relationship between gender and place of violence among residents which was found statistically significant (p<0.01). Association between gender and year of experience of working was also come out to be statistically significant (p<0.05).

**Discussion**

In India, prevalence of violence against doctors has increased. World Health Organization (WHO) also shows concern about the violence against the doctors working in South East Asia region. Due to lack of proper security system, the violence in government hospital is also increasing. It is need of hour for government of India to look into possible solutions for this problem.

The present study was carried out in a tertiary care institution of Haryana and recruited 300 residents. Out of 300 subjects, 65% were male residents and rests were female residents. 47% residents from Accident and Emergency unit followed by 29% residents from Trauma centre and 12% residents from Obstetrics and gynecology unit, Pediatrics and Intensive care unit. The study also recorded the year of experience and found that 83% residents had less than 3 years experience.

The prevalence of violence against doctors in the present study was come out to be 75.6% (197/300). Ori J et al conducted a similar study in Manipur where they reported the same prevalence of workplace violence against post graduate students as in the present study i.e 78.3%. Kapoor M C also reported similar observation that more than 75% of doctors face violence during their practice. Also the Indian Medical Association (IMA) carried out a study, in which they reported that over 75% of doctors have faced some kind of violence in the form of verbal, threats, and/or physical abuse from their patients at their work place. Anand T also reported that verbal abuse (75.4%) was the most common form of violence amongst doctors working in a tertiary care institution. Kumar M et al also consistent with the present study. i.e 87.32% of the incidents were of verbal violence among residents. Some international studies also agreed with our study that verbal abuse was common form of violence among doctors.

Our study took the suggestions from residents to prevent these violences and found that all doctors suggested that strict legal steps should be taken by government. 83.5% of resident felt that doctors should not be overburden with work and 78% doctors suggested that valid consent should be taken before treatment. Majority (95%) of doctors said that there should be installation of CCTV cameras in institution, 81% doctors suggested that entry of patient’s relative or friend in the hospital should be restricted i.e with the patients only one attendant should be allowed in accident and emergency unit or in OPD. 190 doctors said that there should be proper security system and 79% of doctors suggested that there should one counselor in each unit for proper counseling of patients. Nagpal N in his study suggested that legal steps needed to be taken by the government, valid and informed consent should be taken before starting the treatment, there should be proper documentation of the patient’s course in hospital.

In the present study, the association between gender and type of violence was found out to be statistically significant (p<0.001). Also, association between gender and year of experience of working also come out to be statistically significant (p<0.05). This could be because of the fact that the doctors having less experience are unable to handle certain situations and patients tend to look down on them. Some of studies have also gave same opinion.

In the current study, majority of doctors didn’t know the doctor protection law and only 8.5% doctors who faced the violence didn’t lodge the First Information Report (FIR) in police station. This highlights the need to encourage reporting of violence among afflicted workers not only in police station but also to the higher authorities of institution and to develop institutional mechanisms for speedy measures to avoid such events.

In the present study, maximum violence occurred in accident and emergency unit and the relationship between gender and place of violence among residents was found statistically significant (p<0.01). Anand T reported similar observations. Few international studies quoted that usually the environment in the accident and emergency department was recognized
as a violent.\textsuperscript{20} Usually in the emergency and accident department, the patients come with critically ill and they are accompanied by relatives who are anxious and stressed. If they feel that the patient was not attended well, they are more prone to aggression and violence. To handle these situation, the treating doctors should talk politely, should explain in simple-to-understand manner, the nature of the illness/injury, all laboratory investigations required, the possible line or course of management and prognosis.

**Conclusion and Recommendations:**

Workplace violence in any form and in any setting is unacceptable. Violences against doctors are increasing day by day in the government hospitals so there is need of hour to bring about changes in legislations of the Indian Penal Code and Criminal Procedure Code, so that these changes can prevent future incidents of violence against doctors. However, to implement this, there is need of coordinated effort by all section of society. The study also recommended that there should be enhanced security system at government hospitals for the delivery of safe, effective and truly universal health care in the long term.

**Source of Funding** - Self

**Conflict of Interest** - Nil

**References**


Awareness of Knowledge of HIV/AIDS among Women in India and Exposure to Media

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²Research Scholar, Department of Community Medicine, Banaras Hindu University, Varanasi

Abstract

HIV and AIDS are a serious challenge for the developing as well as the developed world. The problem of HIV transmission among women still constitutes high figures in world. In 2016, it was estimated that 36.7 million people were infected with HIV/AIDS in the world among which 17.8 million were women. In India the total number of people living with HIV was 21.17 lakhs in 2015 among which children (<15) account for 6.54% while females contributed around one fifth (40.5%) of total HIV infection. Women in India constitutes a very big part around one fifth of total population living with HIV (40.5%). The importance of mass media for health promotion and disease prevention is well known. Among the total women 92.1% of women have heard the word HIV/AIDS and only 7.9% of women had not. The objective of the study is to assess awareness and knowledge of HIV/AIDS and to examine the associations of exposure to mass media with awareness and comprehensive knowledge of HIV/AIDS, targeting ever-married women in India who are considered as a potentially high risk group. Our study shows that the women listening to radio have a significant association with the comprehensive knowledge of HIV.

Keyword: - HIV/AIDS, Awareness, Knowledge, Indian women, National Family Health Survey-4

Introduction

HIV and AIDS are a serious challenge for the developing as well as the developed world. The problem of HIV transmission among women still constitutes high figures in world. ¹ In 2016, it was estimated that 36.7 million people were infected with HIV/AIDS in the world among which 17.8 million were women ¹. In India the total number of people living with HIV was 21.17 lakhs in 2015 among which children (<15) account for 6.54% while females contributed around one fifth (40.5%) of total HIV infection².

Undivided Andhra Pradesh and Telangana have the highest number of people living with HIV (3.95 lakhs) followed by Maharashtra (3.01 lakh), Karnataka (1.99 lakh), Gujarat (1.66 lakh), Bihar (1.51 lakh) and Uttar Pradesh (1.50 lakhs). These seven states accounts for two third (64.4%) of total people living with HIV. Rajasthan (1.03 lakhs) Tamil Nadu (1.43 lakhs) and West Bengal (1.29 lakhs) states with estimated people living with HIV number of 1 lakhs or more. There are various stigma and discrimination related with HIV that plays as barrier in effective fighting with HIV/AIDS epidemic. Due to these stigma and discrimination people with HIV are shunned by the family and the community. Stigmatization make people hesitate for getting tested, therefore most of the people are unaware of their status and they are making other infected. Education and knowledge of HIV/AIDS plays a very important role in for the prevention of HIV. There are several reasons for the stigma towards people living with HIV among the general population specially youth living in rural areas don’t have adequate and sufficient knowledge of about modes of transmission of HIV due to cultural or religious beliefs or lack of education³.
Women in India constitute a very big part around one-fifth of the total population living with HIV (40.5%). The importance of mass media for health promotion and disease prevention is well known. Routine exposure and strategic use of mass media play a vital role in promoting awareness, increasing knowledge and changing health behaviors.\textsuperscript{15-17} Mass media channels, radio, television, and newspapers, for example, have been suggested to be vital sources of information about HIV/AIDS for ordinary people\textsuperscript{4-6}.

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So there is an immense need of assessing the awareness of HIV among women in India and examine the association of exposure to mass media. Therefore, this study aimed to assess awareness and knowledge of HIV/AIDS and to examine the associations of exposure to mass media with awareness and comprehensive knowledge of HIV/AIDS, targeting ever-married women in India who are considered as a potentially high-risk group.

**Material and Method**

This study was based on the secondary data obtained from National Health and Family Welfare (NFHS-4) conducted in 2015-2016. This survey collected demographic, socioeconomic, and behavioral data, as well as blood samples for HIV testing from nationally representative samples of adult women and men. The NFHS-4 was conducted by IIPS (International Institute of Population Studies).

**Dependent Variable**

The study consists of two types of dependent variable. These variables were assessed by a series of question which were designed to evaluate awareness and knowledge. Awareness of HIV/AIDS was based on the question, “Have you ever heard of HIV/AIDS?” Knowledge of HIV/AIDS was measured with a series of eleven questions asking whether each of the given statements were true. These questions were given only to those who had heard of HIV/AIDS. The statements were: 1) the risk of HIV transmission can be reduced by having sex with only one uninfected partner, who has no other partners; 2) a person can reduce the risk of getting HIV by using a condom every time they have sex; 3) a healthy-looking person can have HIV; 4) a person can get HIV from mosquito bites; 5) a person can get HIV by sharing food with someone who is infected; 6) a person can get HIV by an unsterilized needle/syringe; 7) a person can get HIV by unsafe blood transfusion; 8) HIV can be transmitted from mother to child during pregnancy; 9) HIV can be transmitted from mother to child during delivery; and 10) HIV can be transmitted from mother to child during breastfeeding. Because the first five questions were used for Millennium Developing Goals Indicator 6.3 (percentage of women aged 15–24 years with comprehensive knowledge of HIV/AIDS), “comprehensive knowledge of HIV/AIDS” in this study was also defined as correctly answering all five of these questions.

**Independent Variable**

The NFHS questionnaire included questions on the frequency of media usage, such as television, radio, and newspapers/magazines, using three categories; “not at all”, “less than once a week” and “at least once a week”.

**Statistical Analysis**

Descriptive statistics of the socio demographic characteristic of the respondent by awareness of HIV/AIDS are summarized. Logistic regression analyses were performed to estimate odds ratios (ORs) of awareness or comprehensive knowledge and 95% confidence intervals (CIs) adjusted by respondent’s age, education, current marital status, and household’s wealth index. A P-value of less than 0.05 was considered statistically significant.

**Result and Discussion**

Most of the female were married (69.5%). About 18.3% of women had no education at all. The highest numbers of female were from Uttar Pradesh (10.1%). Women with higher education has highest awareness as compared to other. Television was found to be the most famous medium among all 66.8% of women watched television almost every day and 6.8% at less than week (Table 2). Women with least exposure to media was radio 5.4% of women listen to radio almost every day. Among 10 statement related question about knowledge of HIV/AIDS the proportion for correct answer was highest for People can get HIV/AIDS from blood products or
blood transfusions (81.9%) and lowest for Can get HIV by sharing food with person who has AIDS (61.2%) as shown in Table 3. Awareness of HIV/AIDS was significantly associated with exposure to each of three forms of media (radio, newspaper, and television), as well as with exposure to any type of media when they were combined together (Table 4).

Adjusted OR of awareness of HIV/AIDS was significant for the media exposure as compared to not at all except at least once a week in radio and less than once a week in Television compared to not at all. Table 5 shows the odd ratio of comprehensive knowledge of HIV/AIDS. The associations between comprehensive knowledge and exposure to newspaper, television or radio for the entire category were significant. Those who were exposed radio for less than once a week, at least than once a week, almost every week showed a significantly high OR of comprehensive knowledge as compared to not at all.

Table 1: Knowledge of HIV/AIDS and Media Exposure

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of reading newspaper/magazine (n=91907)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>47096</td>
<td>51.2</td>
</tr>
<tr>
<td>Less than once a week</td>
<td>16494</td>
<td>17.9</td>
</tr>
<tr>
<td>At least once a week</td>
<td>13894</td>
<td>15.1</td>
</tr>
<tr>
<td>Almost every day</td>
<td>14423</td>
<td>15.7</td>
</tr>
<tr>
<td>Frequency of listening Radio (n=91907)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>74338</td>
<td>80.9</td>
</tr>
<tr>
<td>Less than once a week</td>
<td>6262</td>
<td>6.8</td>
</tr>
<tr>
<td>At least once a week</td>
<td>6362</td>
<td>6.9</td>
</tr>
<tr>
<td>Almost every day</td>
<td>4945</td>
<td>5.4</td>
</tr>
<tr>
<td>Frequency of Watching television (n=91907)</td>
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<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>13637</td>
<td>14.8</td>
</tr>
<tr>
<td>Less than once a week</td>
<td>6284</td>
<td>6.8</td>
</tr>
<tr>
<td>At least once a week</td>
<td>10585</td>
<td>11.5</td>
</tr>
<tr>
<td>Almost every day</td>
<td>61401</td>
<td>66.8</td>
</tr>
</tbody>
</table>

Table 2:-Number and proportions of correct answers about HIV/AIDS related knowledge

<table>
<thead>
<tr>
<th>Statement related to the knowledge of HIV/AIDS</th>
<th>Correct answer</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>The risk of getting HIV cane be reduced by having 1 sex partner only, who has no other partners (T)</td>
<td>69409</td>
<td>75.5</td>
<td></td>
</tr>
<tr>
<td>The risk of getting HIV cane be reduced by always using condoms during sex (T)</td>
<td>66815</td>
<td>72.7</td>
<td></td>
</tr>
<tr>
<td>A healthy looking person can have HIV (T)</td>
<td>67887</td>
<td>73.9</td>
<td></td>
</tr>
<tr>
<td>Can get HIV from mosquito bites (F)</td>
<td>59609</td>
<td>64.9</td>
<td></td>
</tr>
<tr>
<td>Can get HIV by sharing food with person who has AIDS (F)</td>
<td>56279</td>
<td>61.2</td>
<td></td>
</tr>
<tr>
<td>People can get HIV/AIDS by injecting drugs (T)</td>
<td>72646</td>
<td>79.0</td>
<td></td>
</tr>
<tr>
<td>People can get HIV/AIDS from blood products or blood transfusions (T)</td>
<td>75268</td>
<td>81.9</td>
<td></td>
</tr>
<tr>
<td>HIV transmitted during pregnancy (T)</td>
<td>73917</td>
<td>80.4</td>
<td></td>
</tr>
<tr>
<td>HIV transmitted during delivery (T)</td>
<td>68558</td>
<td>74.6</td>
<td></td>
</tr>
<tr>
<td>HIV transmitted by breastfeeding (T)</td>
<td>65988</td>
<td>71.8</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Odds ratios (ORs) and 95% confidence intervals (CIs) for awareness of HIV/AIDS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Crude OR</th>
<th>95% CI</th>
<th>P-value</th>
<th>Adjusted OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspaper/Magazine(n=91907)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>Reference</td>
<td></td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than once a week</td>
<td>2.146</td>
<td>1.999 - 2.304</td>
<td>.000</td>
<td>1.287*</td>
<td>1.189 - 1.394</td>
<td>.000*</td>
</tr>
<tr>
<td>At least once a week</td>
<td>3.334</td>
<td>3.043 - 3.652</td>
<td>.000</td>
<td>1.691*</td>
<td>1.530 - 1.868</td>
<td>.000*</td>
</tr>
<tr>
<td>Almost every day</td>
<td>6.595</td>
<td>5.845 - 7.442</td>
<td>.000</td>
<td>2.450*</td>
<td>2.144 - 2.799</td>
<td>.000*</td>
</tr>
<tr>
<td>Radio(n=91907)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>Reference</td>
<td></td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than once a week</td>
<td>1.268</td>
<td>1.145 - 1.405</td>
<td>.000</td>
<td>1.142*</td>
<td>1.027 - 1.270</td>
<td>.015*</td>
</tr>
<tr>
<td>At least once a week</td>
<td>1.287</td>
<td>1.162 - 1.425</td>
<td>.000</td>
<td>1.028*</td>
<td>.925 - 1.142</td>
<td>.612</td>
</tr>
<tr>
<td>Almost every day</td>
<td>1.869</td>
<td>1.633 - 2.139</td>
<td>.000</td>
<td>1.361*</td>
<td>1.186 - 1.563</td>
<td>.000*</td>
</tr>
<tr>
<td>Television(n=91907)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>Reference</td>
<td></td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than once a week</td>
<td>1.236</td>
<td>1.132 - 1.349</td>
<td>.000</td>
<td>.995*</td>
<td>.909 - 1.089</td>
<td>.912</td>
</tr>
<tr>
<td>At least once a week</td>
<td>1.723</td>
<td>1.591 - 1.867</td>
<td>.000</td>
<td>1.192*</td>
<td>1.095 - 1.297</td>
<td>.000*</td>
</tr>
<tr>
<td>Almost every day</td>
<td>3.096</td>
<td>2.921 - 3.281</td>
<td>.000</td>
<td>1.571*</td>
<td>1.464 - 1.685</td>
<td>.000*</td>
</tr>
</tbody>
</table>

Table 4: Odds ratios (ORs) and 95% confidence intervals (CIs) for comprehensive knowledge of HIV/AIDS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Crude OR</th>
<th>95% CI</th>
<th>P-value</th>
<th>Adjusted OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspaper/Magazine(n=91907)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>.727</td>
<td>.681 - .776</td>
<td>.000</td>
<td>.851</td>
<td>.791 - .916</td>
<td>.000</td>
</tr>
<tr>
<td>Less than once a week</td>
<td>.710</td>
<td>.661 - .762</td>
<td>.000</td>
<td>.870</td>
<td>.803 - .943</td>
<td>.001</td>
</tr>
<tr>
<td>At least once a week</td>
<td>.600</td>
<td>.558 - .647</td>
<td>.000</td>
<td>.796</td>
<td>.728 - .871</td>
<td>.000</td>
</tr>
<tr>
<td>Almost every day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio(n=91907)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>1.355</td>
<td>1.244 - 1.475</td>
<td>.000</td>
<td>1.465</td>
<td>1.342 - 1.598</td>
<td>.000</td>
</tr>
<tr>
<td>Less than once a week</td>
<td>1.450</td>
<td>1.335 - 1.575</td>
<td>.000</td>
<td>1.581</td>
<td>1.454 - 1.720</td>
<td>.000</td>
</tr>
<tr>
<td>At least once a week</td>
<td>1.523</td>
<td>1.390 - 1.668</td>
<td>.000</td>
<td>1.707</td>
<td>1.556 - 1.874</td>
<td>.000</td>
</tr>
<tr>
<td>Almost every day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
By using national representative data, the least awareness was found among all the state was in Chandigarh and Daman and Diu. In our study it was found the married women has a higher awareness of HIV. It was also find that knowledge of all ten questions was quite high among all the women. In our study significant association was found among comprehensive knowledge and all media exposure. Among the total women 92.1% of women have heard the word HIV/AIDS and only 7.9% of women had not. This shows that awareness of HIV among women is quite high in India. Our study shows that the women listening to radio have a significant association with the comprehensive knowledge of HIV. So to reduce the risk and transmission of HIV more knowledge should be given through radio to the women in India. Our study also shows the awareness of HIV was low among the Women with no education so it is very important for the government to take concern on education for minimizing the risk of transmission of HIV.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: The data used in this study obtained from MEASURE DHS Archive. The data were conducted by International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for this survey. The authors are grateful to Measure DHS for providing permission to use the 2015-16 National family health survey (NFHS-4) data.

References

1. WHO, UNAIDS. Core epidemiology slides, 2017
7. Sudha RT, Vijay DT, Lakshmi V. Awareness, attitudes, and beliefs of the general public towards HIV/AIDS in Hyderabad, a capital city from South India.
A Study to Assess the Effectiveness of Cognitive Stimulation Therapy with Reference to Cognitive Level among Patient with Dementia in Selected Rehabilitation Center of Pune District

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Abstract

Introduction: Cognitive impairment and dementia are increasing globally and are predicted to rise more in developing regions. It is very important to know that every individuals are born with a different cognitive but many of patient with dementia develop cognitive impairment as disease progress, but to improve the cognitive level to its maximum capacity depends on their involvement in different cognitive stimulation activities. Cognitive stimulation is an involvement of group in different activities and discussions aiming at improving the functioning. Objectives: To evaluate the pre- interventional cognitive level of the Patient With Dementia, To evaluate the effectiveness of cognitive stimulation therapy in Patient With Dementia in selected rehabilitation center, To find the association between the cognitive level of the Patient With Dementia and the selected demographic variables. Materials And Method: Quasi experimental, non randomized control design was conducted on 50 patient with dementia who met the inclusion criteria, by using non-Probabilility purposive sampling. In pretest cognitive level was assessed with the help of standardized Montreal Cognitive Assessment scale followed by Cognitive stimulation therapy which included the 14 sessions of various activities in a period of 4 week was given. On 7th day after intervention post-test was conducted using the same tool by the investigators. Result: Paired t-test used and was found to be 3.82 with 49 degrees of freedom at this 0.05 level which is more than the table value and also the corresponding p-value was small (less than 0.05), hence the null hypothesis is rejected. Cognitive stimulation therapy was found to be effective in patient with dementia. Family history and the duration of illness were found to have significant association with cognitive level of patient with dementia. Conclusion: This study suggests that the cognitive stimulation therapy is helpful in improving the cognitive level of the patient with dementia.

Keywords: Cognitive Level; Dementia; Cognitive Stimulation Therapy; Effectiveness

Introduction

Dementia is an acquired disabling syndrome characterized by progressive deterioration in multiple cognitive domains its severe enough to interfere with daily functioning. Alzheimer’s disease (AD) is the most common cause of dementia, but increasing evidence from population-based neuropathological and neuroimaging studies shows that mixed brain pathologies especially in very old people.1 In the year 2016 on “Recent global trends in the prevalence and incidence of dementia, and survival with dementia. The aim of the study was to project that there is increasing in number of older people at risk. The result revealed that there was increasing prevalence in East Asia.2

Prevalence and incidence of dementia rising with advancing age, and 70% of all dementia cases occur in people who are above at least 75 years old.3 The worldwide increase in the number of older adults, more in those who are at least 80 years old. Because dementia is a one of the prevalent cause of disability and hospitalization of older people, the increased prevalence of this syndrome places more tedious pressures on health-care systems and society. The World Alzheimer Report estimates that, in 2010, there was 35.6 million whereas it is estimated to increase upto 65.7 million by 2030 and 115.4 million by 2050 in worldwide if the
effective measures are not taken.

Cognitive stimulation therapy is important for stimulating the mind, the group sessions offer an opportunity to share experiences and talk with other people with dementia in a relaxed and supportive and cooperative environment. They join in the different activities and conversations this helps them to build self-esteem and confident. Research has shown that CST offers value for money (we call this cost-effective). It has significant benefits to the thinking and memory skills of the people who take part in it. It is very important to bear in our minds that all individuals are born with a phenomenal cognitive but many of dementia patient develop cognitive impairment as disease progress, but to use the cognitive level to its maximum potential depends on their involvement in different cognitive stimulation activities.

Need of the study: A study conducted by Martin Prince et al. in the year 2016 on "Recent global trends in the prevalence and incidence of dementia, and survival with dementia. The aim of the study was to project that there is increasing in number of older people at risk. The result revealed that there was increasing prevalence in East Asia along with worsening cardiovascular disease."

Cognitive Stimulation (CS) has been adapted from rehabilitation programs with individuals with head trauma, stroke, and other neurological disorders, and applied to older adults with dementia. Its aim is on individuals with mild to moderate dementia to improve memory, attention, and general cognitive function. This includes a variety of cognitive training strategies, including specific memory training, general problem solving, multisensory stimulation, word games and puzzles, social activities, and/or use of notebooks or calendars. Hypothesis: H₀ - There is no significance difference in the cognitive level of patient with dementia after the cognitive stimulation therapy.

Operational definition: Effectiveness-It refers to the capacity to produce desired effect of cognitive stimulation therapy in enhancing the cognition of patient with dementia at the rehabilitation center. Cognitive level- "The Cognitive level of the patient with dementia before and after the cognitive stimulation therapy. Cognitive stimulation therapy-Therapy used to stimulate cognitive level among people with mild to moderate dementia through a series of 14 themed activities in 4 weeks, designed to help them to continue to learn and stay engaged. Patient With Dementia - Those patients who are suffering from the dementia and are in mild to moderate state. Rehabilitation center- "The availability of the dementia patient in selected Rehabilitation center, Pune."

Materials and Method

A quantitative, quasi experimental, Non Randomized Control Design was used. In this study dependent variable was the cognitive level of Patient With Dementia and Independent variable was Cognitive Stimulation Therapy. The sample chosen for the present study was 50 patient with dementia by using non-probability, purposive sampling technique which filled in the inclusion criteria and were selected from Rehabilitation center, Pune. The tool used for this study was demographic data (age group, religion, occupational status before illness, socio-economic status, family history of dementia, duration of illness, type of dementia and gender) and the Montreal cognitive assessment tool (visuospatial, naming, attention, language, abstraction, delayed recall and orientation).

Inclusion criteria:

Dementia with a diagnosis of mild to moderate dementia (Montreal Cognitive Assessment score of 10 or more).

Dementia person can have a 'meaningful' conversation.

Dementia person's vision is good enough to see pictures.

Dementia person is likely to remain in a session for 45 minutes

The study includes both male and female dementia patient.

The dementia patient who able to understand, speaks (Hindi, Marathi & English) and cooperate.

Exclusion criteria:

Those within the past 6 weeks who have had a recent acute medical illness such as stroke or heart attack.

Patient who was not present at the time of data collection.
Data Collection: A formal letter seeking approval to conduct the main study was taken. The data collection was carried out from 10/3/18 to 7/4/18 through purposive sampling technique was adopted to grab a sample size of 50. A systematic plan was prepared for the study and efforts were made to stick to the planned schedule. The group were divided into experimental (25) and control(25) followed by pretest. The experimental Group received a cognitive stimulation therapy whereas control group received as usual treatment. Posttest conducted after 7 days i.e on 14/4/18.

Table no.1: Intervention carried out in experimental and control group.  N=50

<table>
<thead>
<tr>
<th>Session</th>
<th>Experimental Group(n=25)</th>
<th>Control Group(n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,3</td>
<td>Physical Games, Sound, Childhood</td>
<td>Music,Art,Exercise</td>
</tr>
<tr>
<td>4,5,6,7</td>
<td>Food, Current Affairs, Faces/Scenes, Word Association</td>
<td>Music,Art,Exercise</td>
</tr>
<tr>
<td>8,9,10</td>
<td>Being Creative, Categorizing Object, Orientation</td>
<td>Music,Art,Exercise</td>
</tr>
<tr>
<td>11,12,13,14</td>
<td>Using Money, Number Games, Word Games, Team Quiz</td>
<td>Music,Art,Exercise</td>
</tr>
</tbody>
</table>

Findings

The data and findings have been organized and presented under the following sections:

Section I Analysis of data related to demographic data in terms of frequency and percentage.

Table no.2: Distribution of demographics variables of the experimental and control group. (N=50)

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group(In Years)</td>
<td>Frequency %</td>
<td>Frequency %</td>
</tr>
<tr>
<td>35-55 Years</td>
<td>8 32%</td>
<td>7 28%</td>
</tr>
<tr>
<td>56-75 Years</td>
<td>11 44%</td>
<td>12 48%</td>
</tr>
<tr>
<td>&gt;75 Years</td>
<td>6 24%</td>
<td>6 24%</td>
</tr>
</tbody>
</table>

Socio Economic Status

<table>
<thead>
<tr>
<th>Middle Socio Economic Status</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle -Upper Socio Economic Status</td>
<td>5 20%</td>
<td>9 36%</td>
</tr>
<tr>
<td>Upper Socio- Economic Status</td>
<td>1 4%</td>
<td>1 4%</td>
</tr>
</tbody>
</table>

Family History Of Dementia

| Yes                                   | 6 24%              | 10 40%        |
| No                                    | 19 76%             | 15 60%        |

Duration Of Illness

| <1 Year                               | 8 32%              | 13 52%        |
| <5 Year                               | 6 24%              | 4 16%         |
| >5 Year                               | 11 44%             | 9 36%         |

Type Of Dementia

| Alzheimer’s Disease                   | 17 68%             | 4 16%         |
| Vascular Dementia                     | 2 8%               | 8 32%         |
| Other                                 | 6 24%              | 13 52%        |
Section II Analysis of data related to the pre interventional cognitive level in Patient With Dementia

Fig. no.1 Pretest cognitive level of the patient with dementia

Fig.1 depicts, in experimental group 52% of the samples suffering from mild cognitive impairment, 16% of them suffering from mild dementia and 32% of them suffering from Moderate dementia. In control group 72% of the samples suffering from mild cognitive impairment, 12% of them suffering from mild dementia and 16% of them suffering from Moderate dementia.

Section III Analysis of data related to the effectiveness of cognitive stimulation therapy in Patient With Dementia

Table no.3: The Paired t test for the effectiveness of cognitive stimulation therapy in the posttest experimental group and control group of patient with dementia

<table>
<thead>
<tr>
<th>Posttest Group</th>
<th>Mean</th>
<th>SD</th>
<th>T</th>
<th>Df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>19.08</td>
<td>5.67</td>
<td>3.82</td>
<td>49</td>
<td>0.000</td>
</tr>
<tr>
<td>Control</td>
<td>13.8</td>
<td>4.42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table no.3 shows that T-value for this test was found to be 3.82 with 49 degrees of freedom at this .05 level which is more than the table value and also the corresponding p-value was small (less than 0.05), null hypothesis is rejected. Cognitive Stimulation Therapy was found to be effective in patient with dementia.

Section IV: Analysis Of Data Related To The Association Between Cognitive Level Of The Patient With Dementia And Selected demographic variables.

Table no.4: Fisher’s exact test for the association between cognitive level and selected demographic variables of dementia patient

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Mild Cognitive impairment</th>
<th>Mild Dementia</th>
<th>Moderate dementia</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-55 years</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>0.894</td>
</tr>
<tr>
<td>56-75 years</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>(not significant)</td>
</tr>
<tr>
<td>Above 75 years</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
Researchers applied Fisher’s exact test for association of cognitive level of dementia patient with their demographic variables. Since p-value corresponding to family history of dementia and duration of illness is small (less than 0.05), family history and the duration of illness was found to have significant association with cognitive level of patient with dementia.

**Conclusion**

Cognitive Stimulation Therapy given to the experimental group found to be effective and play pivotal role in improving the cognitive level in dementia patient, while comparing with the control group. The health care professionals should know that there is a hope in dementia care and that there is something that can be done to improve their condition, As the improvement in cognition is directly proportional to the improvement in quality of life, self-care daily activities and depression. This study suggest that the cognitive stimulation therapy can be extended and prolonged for a longer period of time independently of the dementia, as it will result in slow down the dementia process.

**Conflict of Interest:** Nil

**Source of Funding:** Self funded

**Ethical Consideration:** Permission has been taken from the Institute Ethical Committee of Symbiosis International (Deemed University). Hospital administration permission has been taken prior to the pilot and main study. Informed consent has been taken from the each subjects. Confidentiality of the subject has been maintained. Permission has been taken for the use of standard tool from the www.mocatest.org.

**References**


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Assessment of Drug Adherence and Prescription Pattern of Hypertensive Patient’s in a Rural Community of Ludhiana

Rohit David¹, Daneshwar Singh², Shavinder Singh³

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Abstract

Background: Hypertension is inadequately controlled in most patients due to poor treatment adherence. Not much is known about the anti hypertensive drug prescription pattern in rural areas. Objectives: The present study was conducted to assess the drug adherence and prescribing patterns of antihypertensive in hypertensive patients and adherence of prescribing pattern with existing guidelines. Materials and Method: The cross sectional study was conducted in the rural field practice area of Community Medicine department of Christian Medical College, over a period of one year. A house to house survey of 214 diagnosed hypertensive patients was conducted using a predesigned pretested structured questionnaire. After completing the interview, two blood pressure readings were recorded in sitting position in the right arm using an electronic BP monitoring device. Treatment adherence was assessed using Morisky Green Levine Scale. The data was entered and analyzed using Microsoft Excel 2010 and Epi Info 7.14. Results: Only 4.7% of respondents achieved blood pressure control with treatment. Respondents on monotherapy had higher treatment adherence than those on combination therapy. Keywords: Adherence, Hypertension, Prescription Pattern

Introduction

Hypertension is a chronic condition of concern due to its role in the causation of coronary heart disease, stroke and other vascular complications. It is the commonest cardiovascular disorder, posing a major public health challenge to population in socio-economic and epidemiological transition. It is one of the major risk factors for cardiovascular mortality, which accounts for 20-50 percent of all deaths. Although blood pressure is easily measured, it had taken several decades to realize that arterial hypertension is a frequent, worldwide health disorder. High blood pressure is one of the most common – and manageable – risks for disabling and life-threatening strokes and other cardiovascular events. While relatively easy to detect and manage, high blood pressure is largely an invisible and neglected condition in low-resource settings, creating substantial disability and premature mortality. It is estimated that more than one billion adults are hypertensive worldwide and this figure is projected to increase to 1.56 billion by the year 2025, which is an increase of 60 % from 2000. A whopping 9.4 million deaths occur worldwide every year because of hypertension, with it being responsible for about 50 % of mortality due to heart disease and stroke. Epidemiological studies demonstrated that prevalence of hypertension is increasing rapidly in India, varying from 4 to 15 % in urban and 2-8 % in rural population. Lowering of systolic blood pressure by 10-12 mm Hg and diastolic blood pressure by 5-6 mm Hg confers relative risk reductions of 35-40% for stroke and 12-16% for coronary heart disease within 5 years of initiating treatment. The choice of an antihypertensive drug is based on efficacy, side-effects, effects on other systems and cost. Accordingly, there is a need to contemplate the exemplar of usage of antihypertensive drugs, to see if the current usage is rational and in concordance with current guidelines for treatment of hypertension. Studying the prescribing patterns is that part of a medical audit which seeks monitoring, evaluating and if necessary, suggesting necessary modifications to the prescribers to achieve rational and cost effective medical care.
Changes over time in terms of recommended guidelines and innovation in drug formulations have resulted in modification to the prescription patterns of antihypertensive drugs. This kind of study highlights the gaps and help in improving the patient health care further. Thus, this study was conducted to assess the drug adherence and prescribing patterns of antihypertensive in hypertensive patients and adherence of prescribing pattern with existing guidelines.

**Materials and Method**

This was a community based Cross Sectional Study conducted in the field practice area of Community Medicine Department, CMC, Ludhiana, Punjab. This was a questionnaire based assessment.

**Study Population:** The study population consisted of all hypertensive patients residing in the in the field practice area of Community Medicine Department, CMC, Ludhiana, Punjab.

**Study Period:** Study was undertaken from the month of August 2015 to October 2015 for a period of three months.

**Inclusion Criteria:** All patients of either sex with primary essential hypertensive patients diagnosed as per Joint National Committee-VII (JNC-VII) guidelines and those receiving or prescribed with antihypertensive drugs in the above time period were included.

**Exclusion Criteria:** Patients below the age of 18 years, female who were pregnant, those who were absent on the day of visit and all those not unwilling to participate in the study are excluded from the study.

**Sample Size and Sampling Technique:** Sample size was calculated with an estimated prevalence of 30%, precision of 6%, and confidence interval of 95%. Prescriptions of 214 patients aged more than 18 years (Mean: 52.6 ±14.6) with a male to female ratio of 1:1.2 were selected by simple random sampling technique using table of random numbers. Approval was taken from the Institutional Ethics Committee prior to the commencement of the study (Ref. No. BFUHS/2K13/P-Th/9868).

**Study tool:** A semi-structured self-administrative pre tested questionnaire was developed with the aid of a WHO tool – “How to investigate drug use in health facilities” and Morisky Green Levine medication adherence scale for data collection to fully meet the demands of this research. Reliability is ensured by justification of approaches within the context of study that it is a time-bound applied research. The questionnaire used was pretested and checked for face validity. No major changes were made after the pretest.

**Measures:** Systolic and diastolic blood pressure (SBP & DBP) was measured twice at an interval of 3 min in the sitting position after a 15 min rest, and the mean was taken. Stage of hypertension at diagnosis was according to the JNC 7 classification. Patients with systolic blood pressure of 140–159 mmHg or diastolic 90–99 mmHg were classified as stage 1 while patients with systolic blood pressure of ≥ 160 mmHg or diastolic ≥ 100 mmHg were classified as having stage 2 hypertension. The primary outcomes used was the achievement rates of target blood pressure (i.e BP < 140/90 mmHg or < 130/80 mm Hg for diabetics). Persistence with therapy according to the International Society for Pharmacoeconomics & Outcomes research was defined as the continuing use in time of the prescribed therapy. This was recorded as documented from patient’s history in the prescription. The scheduled clinic visits were assessed. Blood pressure control was defined as the maintenance of blood pressures values less than 140/90 mm Hg during at least two successive appointments. Adherence to drug regimen was assessed using patient’s prescriptions. Drug adherence was assessed according to Morisky Green Levine medication adherence scale.

**Data Collection and Procedure:** Data were collected by household survey of diagnosed hypertensive patients enrolled in departmental disease registry. After obtaining their informed consent the participants were interviewed using the basic parameters stipulated in our questionnaire. We enquired about the available prescription at that time of visit, history of visiting a health facility in the catchment area and relevant data was collected.

**Statistical analyses:** Data obtained were collated and analyzed statistically by Microsoft Excel 2010 and Epi Info 7.14 for various parameters relating to prescription pattern. Each completed questionnaire was coded on pre-arranged coding to minimize errors.
### Results

**Table 1 Age Gender distribution & Classification of Hypertensive Respondents**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 to &lt;40 years</td>
<td>5(17.9)</td>
<td>23(82.1)</td>
<td>28(100)</td>
</tr>
<tr>
<td>40 to &lt;50 years</td>
<td>6(24.0)</td>
<td>19(76.0)</td>
<td>25(100)</td>
</tr>
<tr>
<td>50 to &lt;60 years</td>
<td>20(30.3)</td>
<td>46(69.7)</td>
<td>66(100)</td>
</tr>
<tr>
<td>60 years and above</td>
<td>39(41.1)</td>
<td>56(58.9)</td>
<td>95(100)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70(32.7)</td>
<td>144(67.3)</td>
<td>214(100)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hypertension Class</th>
<th>Number(percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>10(4.7)</td>
</tr>
<tr>
<td>Pre hypertensive</td>
<td>45(21.0)</td>
</tr>
<tr>
<td>Stage 1</td>
<td>91(42.5)</td>
</tr>
<tr>
<td>Stage 2</td>
<td>68(31.8)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>214(100)</td>
</tr>
</tbody>
</table>

**Table 2 Group of Anti Hypertension drugs used by respondents and their frequency**

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Number (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angiotensin Converting Enzyme Inhibitor</td>
<td>19(6.7)</td>
</tr>
<tr>
<td>Angiotensin Receptor Blockers</td>
<td>33(11.7)</td>
</tr>
<tr>
<td>Beta Blockers</td>
<td>62(22.0)</td>
</tr>
<tr>
<td>Calcium Channel Blockers</td>
<td>116(41.1)</td>
</tr>
<tr>
<td>Diuretics</td>
<td>16(5.3)</td>
</tr>
<tr>
<td>No Medications</td>
<td>37(13.4)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>283(100)</td>
</tr>
</tbody>
</table>

**Table 3: number of pills taken per day and the current blood pressure control status**

<table>
<thead>
<tr>
<th>Complexity of medications</th>
<th>Number (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pills</td>
<td>37(17.3)</td>
</tr>
<tr>
<td>1</td>
<td>110(51.4)</td>
</tr>
<tr>
<td>2</td>
<td>60(28.1)</td>
</tr>
<tr>
<td>3</td>
<td>7(3.3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>214(100)</td>
</tr>
</tbody>
</table>
Discussion

The study included respondents above 18 years of age (mean 52.6 +/- 14.6) residing in the field practice area of Christian Medical College Ludhiana Punjab. The study included 214 respondents with a gender distribution of 67.3% Females and 32.7% Males. In Bangalore 45.3% and 54.6% male were studied by Rachana et al.(18). So according to the present study, majority of respondents were above 60 years. Similar to a study conducted by Abegaz et al(20) where majority of respondents(25.5%) were between 51 to 60 years.

The study also showed that only 4.7% of respondents had achieved normal blood pressure, even with treatment. And majority of respondents were in stage 1 hypertension. As seen here that only medications do not control hypertension, other factors like periodic follow up and proper lifestyle modifications are a must. Most of the study conducted on hypertension treatment also showed that majority of respondents were in stage 1 hypertension(19). Most commonly used anti hypertension drug group (41.1%) were found to be Calcium Channel Blockers (CCB). CCB are not only effective in controlling Blood Pressure, but are also comparatively cheaper than most other anti hypertension medications, thus promoting better adherence. Where Rakesh et al(19) found that CCB were the most common used monotherapy for hypertension treatment. Also in a study conducted on drug utilization, it was concluded that CCB comes under the most commonly prescribed drug group by S.Datta(21). The statement are contradictory to the guidelines for Hypertension control presented in JNC 7 criteria, where diuretics were advised for stage 1 hypertension(22) before trying other groups, which is not followed by many treating physician till date.

In our study it was seen that majority of respondents were on monotherapy (51.4%). And most of the respondents in stage 1 hypertension were prescribed monotherapy, which is in accordance to JNC 7 treatment guidelines for stage 1 hypertension. Rachana et al (18) also concluded in her study that majority of respondents were in Stage 1 hypertension and monotherapy(48.9%) treatment. The study conducted by Xu et al(23) in China, it was found that majority of physician prescribed monotherapy for blood pressure control instead of polytherapy.

It was seen in the study that 53.5% respondents had low treatment adherence. More emphasis should be laid by treating physician to educate for life style modification along with treatment, as only by promoting high adherence along with risk factor modifications will lead to better blood pressure control. In the study of Rakesh et al(19), it was seen that adherence rates were
higher with monotherapy with polytherapy, and higher adherence rates were seen in stage 1 hypertension then in stage 2 hypertension. Similar findings were confirmed by our study, which showed that higher treatment adherence was seen in monotherapy than with combination therapy, and this association was found to be statistically significant.

**Summary**

The present study of Assessment of Drug adherence and Prescription Pattern of hypertensive patients, is based on a house to house survey of diagnosed hypertensive patients in the field practice area of Christian Medical College, Ludhiana. Most of the respondents of the study were above 60 years (44.4%) and females (67.3%). It was seen in the study that only 4.7% of respondents had achieved normal blood pressure and most of them were still in stage 1 hypertension. The majority of respondents were prescribed anti hypertensive drug class was CCB (41.1%). Most of the respondents were on monotherapy.

In the study it was seen that 53.3% had low treatment adherence according to morisky green adherence scale. It was also seen that respondents on monotherapy showed higher treatment adherence than with combination therapy, and this association was found to be statistically significant.

**Conclusion**

The results suggest that the rural population of Ludhiana has a large number of uncontrolled hypertensive patients, most of whom have low treatment adherence. The study concluded that the recommended prescription pattern, as according to JNC 7 were not practiced in the rural community by the prescribing physicians, one of the factors leading to low treatment adherence and uncontrolled hypertension. Hence steps must be taken to educate the prescribing physicians along with the patients on recommended treatment guidelines for hypertension. And also emphasis should be put on regular follow up, health education and life style modification to effectively treat this non communicable disease leading to further improvement its treatment adherence.

**Limitation of Study:** The study was conducted in the morning hours, thus most of the working males could not be contacted leading to more females than males in the study.

**Strength of the Study:** Christian Medical College Ludhiana maintains a detailed registry of hypertensive patients in its field practice area, so most of the hypertensive patients could be contracted through it. Morisky Green Levine treatment adherence scale, used in the study, is a standardized scale for measuring drug adherence.

**Source of Funding:** Nil

**Conflict of Interest:** Nil

**References**


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17. ISPOR MEDICATION COMPLIANCE AND PERSISTENCE SPECIAL INTEREST GROUP [Internet]. [cited 2018 Apr 16]. Available from: https://www.ispor.org/sigs/medication.asp


Biomass Energy: Prospects and Problems

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¹Assistant Professor; ²Professor and Head, ³Associate Professor, Dept. of Economics, VISTAS

Abstract

Biomass energy consumption is very significant almost in all the countries. In India, 80 percent of the households depend on firewood and cow dung cakes for the cooking needs. Biomass energy can be tapped throughout the year through agricultural waste, human and animal waste. The better utilization of biomass would be the best alternative to the fast depleted fossil fuels like petrol, coal and natural gas. Electricity through biomass gasifier emits less CO₂ compared to the coal based electricity plants. The methane is generated from bio waste through land fill method and the methane gas is utilized like Liquefied Petroleum Gas. Hence, biomass energy has the features of environmental friendly, social acceptability and sustainability in its uses. Bio energy crops are widespread, although the availability of land for expansion is a question.

Keywords: Biomass, Fossil fuel, Green energy, Biomass Gasifier, Ethanol.

Introduction

Biomass is a term which is used to describe material of recent biological origin that can be used either as a source of energy or for its chemical components. It consists of trees, crop algae and other plants as well as agricultural and forest residues. It also consists of many materials including food and drink manufacturing effluents, manures, industrial by-products and household wastes. At present, in the global scenario biomass contributes 14 per cent of the world energy and 38 percent to the developing countries. (Wood and Hall, 1994). The substantial use of biomass energy in the developing countries especially in the rural areas helps to meet out the energy crisis.

Biomass energy is one of the green energy items and it plays a vital role around the globe. Non-renewable items like oil, coal and natural gas are getting depleted very fast in recent years. Besides, the use of fossil fuel emits more pollution. Environmental degradation such as global warming, ozone depletion and acid rain etc., arises due to the pollutant air.

Hence, the world is giving importance to biomass. Solar, Tidal and wind energy are highly renewable sources. Biomass meets the cooking energy needs of most of the rural households and half of the urban households. Despite it is the commercial energy in India, biomass continues to dominate energy supply especially in rural areas. It is estimated that the share of biomass in total energy in India vary from nearly a third (36 per cent) to half (46 per cent) of total energy.¹ In this backdrop this article tries to trace the importance of biomass energy, biomass energy potential in various states, problems in its utilization and environmental impacts.

Importance of Biomass Utilization

Fossil fuels emit more CO₂ and it is the main reason for global warming and acid rain. Eventually, all the countries are taking many initiatives to check the climate change. Renewable energy source such as solar, wind, tidal and geo-thermal do not emit Green House gasses. Electricity through biomass gasifier emits less CO₂ compared to the coal based electricity plants². The methane is generated from bio waste through land fill method and the methane gas is utilized like Liquefied Petroleum Gas. Hence, biomass energy has the features of environmental friendly, social acceptability and sustainability in its uses.

The comparative position of the biomass potential as assessed by MNRE and the State Nodal Agencies (SNAs) is given in Table 1.

Analysis of the data in the table 1 brings out that there were variations in the biomass potential assessed by MNRE and the SNAs in the 16 states that undertook such study. Eight SNAs had not done any potential assessment; significant among them was the SNA of
Madhya Pradesh, which ranked sixth in terms of potential assessed by MNRE.

### Table 1: Biomass Power Potential as assessed by MNRE and SNAs

(In MW)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>State</th>
<th>Potential estimated by MNRE</th>
<th>Potential estimated by SNA</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Andhra Pradesh</td>
<td>150.20</td>
<td>448.50</td>
<td>-298.30</td>
</tr>
<tr>
<td>2.</td>
<td>Arunachal Pradesh</td>
<td>Not assessed</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>3.</td>
<td>Assam</td>
<td>165.50</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>4.</td>
<td>Bihar</td>
<td>530.30</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>5.</td>
<td>Chhattisgarh</td>
<td>220.90</td>
<td>1000</td>
<td>-779.10</td>
</tr>
<tr>
<td>6.</td>
<td>Gujarat</td>
<td>1014.10</td>
<td>900</td>
<td>114.10</td>
</tr>
<tr>
<td>7.</td>
<td>Haryana</td>
<td>1,261</td>
<td>1,150</td>
<td>111</td>
</tr>
<tr>
<td>8.</td>
<td>Himachal Pradesh</td>
<td>128</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>9.</td>
<td>Jammu &amp; Kashmir</td>
<td>31.80</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>10.</td>
<td>Jharkhand</td>
<td>66.80</td>
<td>90</td>
<td>-23.20</td>
</tr>
<tr>
<td>11.</td>
<td>Karnataka</td>
<td>843.40</td>
<td>2,500</td>
<td>-1,656.60</td>
</tr>
<tr>
<td>12.</td>
<td>Kerala</td>
<td>762.30</td>
<td>1,044</td>
<td>-281.70</td>
</tr>
<tr>
<td>13.</td>
<td>Madhya Pradesh</td>
<td>1,065.40</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>14.</td>
<td>Maharashtra</td>
<td>1,585</td>
<td>2,281</td>
<td>-696</td>
</tr>
<tr>
<td>15.</td>
<td>Meghalaya</td>
<td>1.10</td>
<td>165.30</td>
<td>-164.20</td>
</tr>
<tr>
<td>16.</td>
<td>Mizoram</td>
<td>Not assessed</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>17.</td>
<td>Nagaland</td>
<td>3.10</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>18.</td>
<td>Odisha</td>
<td>147.30</td>
<td>240</td>
<td>-92.70</td>
</tr>
<tr>
<td>19.</td>
<td>Punjab</td>
<td>2,674.60</td>
<td>1,100</td>
<td>1,574.60</td>
</tr>
<tr>
<td>20.</td>
<td>Rajasthan</td>
<td>4,595</td>
<td>1,039</td>
<td>3,556</td>
</tr>
<tr>
<td>21.</td>
<td>Tamil Nadu</td>
<td>863.70</td>
<td>1,671</td>
<td>-807.30</td>
</tr>
<tr>
<td>22.</td>
<td>Uttar Pradesh</td>
<td>1,477.90</td>
<td>3,757</td>
<td>-2,279.10</td>
</tr>
<tr>
<td>23.</td>
<td>Uttarakhand</td>
<td>6.60</td>
<td>262.31</td>
<td>-255.71</td>
</tr>
<tr>
<td>24.</td>
<td>West Bengal</td>
<td>368.30</td>
<td>6,663</td>
<td>-6,294.70</td>
</tr>
</tbody>
</table>

**Source:** Ministry of New and Renewable Energy and State Nodal Agencies, 2017

**Problems in the Utilization of Biomass**

There are no proper markets is the most important issue for biomass in India. Owing to the non-availability of markets, ensuring reliable and enhanced biomass supply and technologies at competitive cost is inconsistent. The most economical option is to focus on better utilization of biomass waste through improved collection of agro residues and dung, better utilization of waste from sugar mills especially the molasses which can be converted into ethanol.

In India Kerosene is the substitute commercial fuel for biomass in the domestic cooking sector. The biomass competes with kerosene in domestic use. In commercial energy market. The price of biomass in the market is equal to the price of kerosene and diesel as kerosene and...
diesel are getting subsidies. The kerosene is subsidized to the tune of 60 per cent and due to these reasons the biomass products are not able to get the economic prices in the commercial energy market in India.

The people’s awareness on biomass utilization also less in developing countries compared to developed countries. Awareness campaign may be given to the people, especially to the rural masses about the potential, value and environmental concerns over the biomass energy utilization. The Ministry of New and Renewable Energy (MNRE) may take more initiative with the collaboration of ministry of agricultural for the better utilization of biomass energy in India.

**Environmental Impacts of Biomass Energy**

Biomass energy system is not free from environmental issues that must be addressed. Biomass energy projects has issues such as air pollution, impact on forests and impact due to crop cultivation, these issues must be addressed in the environmental point of view Other non-renewable energy sources caused more net contribution of carbon dioxide. But the biomass energy can be produced and consumed in a sustainable manner. The burning of fossil fuels result in more carbon, that carbon is stored underground for years, this leads to atmospheric greenhouse gases. Hence, if we use biomass wisely, it can have environmental advantages over the use of fossil fuels. An appropriate level of biomass energy use can have less environmental impacts than our current means of energy production.

**Conclusion**

Biomass energy consumption is very significant almost in all the countries. In India, 80 percent of the households depend on firewood and cow dung cakes for the cooking needs. Biomass energy can be tapped throughout the year through agricultural waste, human and animal waste. The better utilization of biomass would be the best alternative to the fast depleted fossil fuels like petrol, coal and natural gas. The main problem for the biomass energy is the non-availability of regular markets. If the local bodies take initiatives with the help of central and state governments for the better trading and utilization, biomass energy would do many wonders and boost the rural economy.

**Ethical Clearance:** Completed. (Dept. level committee at VELS)

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

Assess Knowledge and Practice Regarding Partograph among Staff Nurses: Pre experimental Study

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Abstract

Background: Inadequate care during labor results in threats to the life of the mother and fetus. In order to prevent complications during labor and for a better outcome, it is essential to follow the simple and effective tool such as a Partograph, by the health care providers with an adequate knowledge and skill. Partograph represent graphical record of cervical dilation during labor.

Design: Pre experimental one group pre test post test design was used to assess the Effectiveness of Self Instructional Module (SIM) on Knowledge and Practice regarding Partograph. Convenient sampling techniques were used to select sample. Informed written consent was taken from each Staff Nurses. A structured questionnaire and checklist were used to assess the knowledge and practice.

Result: The findings of the study revealed that pre test knowledge 70% had inadequate, 30% had moderate knowledge and pre test practice 65% had poor 35% had average practice regarding partograph among staff nurse. Post test knowledge 67% had adequate knowledge, 33% had moderate knowledge and post test practice 78% good practice, 22% had average practice regarding partograph among staff nurse. Knowledge was significantly associated with educational qualification 0.016 at significance of p<0.05 level. There is no association was found between knowledge and other demographic variables like age, total working experience, experience in maternity unit, work place and attend any in-service education on monitoring labor process. In practice, experience in maternity unit was significant 0.045 at p<0.05 level and attend any in-services education on monitoring labor was 0.021at p< 0.05 level. No association found between practice and other demographic variables like age, education qualification, total working experience, work place etc.

Conclusion: Self instructional module will be effective in improving knowledge and practice regarding partograph among staff nurses in recognized hospitals at Gurugram.

Keyword: Labor, physiologic process, complications, Partograph, cervical dilation.

Introduction

A partograph is one of the valuable appropriate technologies in use for improved monitoring of labor progress, maternal and fetal wellbeing. It is an important tool for managing labor. This is through enabling clinicians (midwives and doctors) to plot examination findings from their assessments on the partograph. The belief that its use was applicable in developed and developing settings led to its introduction worldwide. A number of common partograph designs incorporate an alert and action line. The development of the partograph provided health professionals with a pictorial overview of labor progress, maternal and fetal condition to allow early identification and diagnosis of pathological labor. Its use is critical in preventing maternal and perinatal morbidity and mortality.

Globally, there were an estimated number of 287,000 maternal deaths or a maternal mortality ratio (MMR) of...
210 maternal deaths per 100,000 live births in the year 2014. The estimated total number of 287,000 maternal deaths\(^4\).

Worldwide, 85% (245,000) of the majority of maternal deaths and complications attributable to obstructed and prolonged labor could be prevented by cost-effective and affordable health interventions like the use of partograph\(^5\).

Therefore the partograph should be used for all women admitted in established labor. The partograph serves as an “early warning system” and assists in early decision on transfer, augmentation and termination of labor. It also increases the quality and regularity of all observations on the fetus and the mother in labor and aids early recognition of problems with either. Prolonged labor in the developing world is commonly due to cephalo-pelvic disproportion which may result in obstructed labor, maternal dehydration, exhaustion, uterine rupture and vesico-vaginal fistula\(^6\).

**Methodology**

**Research design:**

One group pre test post test experimental group design was adopted to accomplish the main objective of the study i.e, to assess the effectiveness of the SIM on knowledge and practice regarding partograph.

**Selection of field for study:**

The study was conducted on staff nurses working in maternity unit in recognized hospital. The investigator had selected 13 staff nurses from SGT hospital, 16 staff nurses selected from Civil hospital, 14 staff nurses selected from E.S.I.C Hospital, 08 staff nurses selected from Sunrise Hospital Gurugram and 09 staff nurses, were selected from Columbia Asia Hospital, Gurugram who all are working in maternity units. The rational for selecting the samples from these recognized hospitals was the researcher familiarity with setting area, availability of the subjects and feasibility of conducting the study.

**Hypotheses**

**H1:** There will be significant difference in pre test and post test knowledge regarding partograph among staff nurses in recognized hospitals at Gurugram.

**H2:** There will be significant difference in pre test and post test practice regarding partograph among staff nurses in recognized hospitals at Gurugram.

**H3:** There will be significant association between the post test knowledge, and practice regarding partograph among staff nurses with their selected demographic variables.

**Sample and sampling technique:**

The sample size for the final study consists of 60 Staff Nurses working in maternity unit in recognized hospitals. Convenient sampling technique was used to select the sample. The rational was the number of staff nurses working in maternity units was limited.

**Variables under study:**

**Independent variable:** Independent variable was Self instructional module regarding partograph.

**Dependent variable:** Dependent variables are knowledge and practice regarding partograph among Staff Nurses.

**Demographic variables** – Age, professional qualification, total year of experience, total year of experience in maternity unit, work place and attend any previous in-service education in partograph.

**Tools for data collection:**

Section a: Selected demographic variables

Section b: Prepared SIM on partograph

Section c: Structured questionnaire to assess knowledge regarding partograph.

Section d: Checklist to assess expressed practice regarding partograph.

**Description of tool:**

The tool has been developed to assess the effectiveness of self instructional module.

**Section a:** This is prepared to collect the data regarding Age (in years), Educational qualification, Total working experience, Experience in maternity unit, Workplace, Attend any in-service education on monitoring labor process.

**Section b:** self instructional module it is a study material on WHO modified partograph.
Section c: This section deals with structured knowledge questionnaire. It consist 27 questions which was used to assess the level of knowledge regarding partograph among staff nurses in recognized hospitals Gurugram. Each correct response carries one (1) mark, incorrect responses carries zero (0) marks.

Section d: This section deals with a checklist for assessing the expressed practice regarding partograph among staff nurses in recognized hospitals Gurugram. Each ‘YES’ response carries one (1) marks and ‘NO’ carries zero (0) mark.

Results

Major findings:

The analysis of data revealed the following headings:

Age (in years), majority of percentage (53.33%) of staff nurses were in the age group of 20-29 years.

Educational qualification, majority of percentage (53.33%) of staff nurses were in the age group general nursing midwifery (GNM).

Total working experience, majority of percentage (61.66%) of staff nurses were having a experience less than 5 years.

Experience in maternity unit, majority of percentage (48.33%) of staff nurse had a experience in between 1-5 year.

Workplace, majority of percentage (63.33%) of staff nurses were working in private hospitals.

Attend any in-service education on monitoring labor process, majority of percentage (85%) of staff nurses those who are not attended any in service education program.

TABLE 1: Mean pre test knowledge score of staff nurses regarding partograph n=60

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of staff nurses regarding partograph.</td>
<td>8.75</td>
<td>±3.14</td>
<td>4-18</td>
</tr>
</tbody>
</table>

Pre test knowledge among staff nurse 70% had inadequate knowledge and 30% had moderate knowledge regarding partograph among staff nurse.

Pre test practice among staff nurse 65% had poor practice and remaining 35% had average practice regarding partograph among staff nurse.

Post test knowledge 67% staff nurses had adequate knowledge and remaining 33% had moderate knowledge regarding partograph among staff nurse.

Post test practice 78% staff nurses had good practice and 22% had average practice regarding partograph among staff nurse.

TABLE 2: Mean pre test practice score of staff nurses regarding partograph n=60

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice of staff nurses regarding partograph.</td>
<td>8.48</td>
<td>±2.28</td>
<td>5-16</td>
</tr>
</tbody>
</table>

Association of post test knowledge regarding partograph among staff nurses with selected demograph variables. Educational qualification was found statistically significant at of 0.006 p<0.05.
Association of post test practice regarding partograph among staff nurses with selected demographic variables such as age (in years). Maternity experience was 0.045, attend any in-service education was 0.021 on monitoring labor process was found statistically significant at at p<0.05.

Association of post test knowledge regarding partograph among staff nurses with selected demographic variables such as age (in years), total working experience, and workplace, maternity experience, attend any in-service education on monitoring labor process was not found statistically significant at the level of significance of p<0.05.

Association of post test practice regarding partograph among staff nurses with selected demographic variables such as age (in years), total working experience, and workplace, Educational qualification was not found statistically significant at the level of significance of p<0.05.

Summary

The study was conducted to assess the effectiveness of self instructional module (SIM) on knowledge and practice regarding partograph among staff nurses in recognized hospitals at Gurugram”. Convenient sampling technique was used for selection of samples. Therefore conceptual framework was developed based on Daniel stufflebeam’s evaluation model (CIPP model). The pilot study was conducted during the month of November and December on 09 Staff Nurses were selected in Aarvy hospital Gurugram. This procedure was done to ensure the reliability of tools and feasibility of study. Socio demographic variables like age, Educational qualification, Total working experience, Experience in maternity unit, Workplace, Attended any in –service education on monitoring labor process, Structured questionnaire for knowledge and checklist for practice were used to assess the knowledge and practice regarding partograph. The actual data collection procedure was carried out from December to January. Total sample of 60 Staff Nurses were selected by using convenient sampling technique from recognized hospitals are SGT hospital, Civil hospital, E.S.I.C hospital, Sunrise hospital and Columbia Asia hospital. Before collection of final data were taken informed consent were taken from Staff Nurses. Therefore the data of the final study was collected and analyzed by using descriptive and inferential statistics. Calculation of frequency, percentage, means, standard deviation, chi-square, t-test was done. The data has been represented in the form of tables, bars and pie diagrams. The 70 % Staff nurses had inadequate knowledge 30% had moderate knowledge and 65% had poor practice 35% had a average practice in pre test and 67% staff nurses had adequate knowledge 33% were had moderate knowledge and 78% had good practice 22% had average practice in post test regarding partograph among staff nurses. In this study demographic variables such as educational qualification (GNM) was 0.006 showing association with knowledge score and maternity experience (1-5 year) was 0.45 and attend any in-service education was 0.021 showing association with practice score at the level of significance of p<0.05. The study shows the significant difference with paired’t’ test value for knowledge (19.023) and for practice (23.799) at p<0.05 level of significance. Hence it proven that the research hypothesis was accepted.

Conclusion

The Study concluded that there was a significant difference in knowledge and practice score of staff Nurses before and after administering the self instructional module (SIM) regarding partograph. The association of post test knowledge and practice score regarding partograph among staff nurses with selected demographic variables educational qualification was 0.006, experience in maternity was 0.045, attend any in-service education program was 0.021 found significant at p<0.05 level of significance. It was proven that the effectiveness of self instructional modules was effective for staff nurses regarding partograph.

Ethical Clearance: Research proposal was approved by ethical / DRC committee of Faculty of Nursing, SGT University.

Source of Funding: Self

Conflict of Interest: Nil

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Short Term Effect of Physical Activity on Anxiety and Depression in Adolescents

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Abstract

Background: Mental health disorders pose an emotional, social, academic burden on the children as well as their parents and families. Non-pharmacological therapy has been proved to be useful in various studies by improving the mental status of the individual. Physical activity is a low risk and high benefit intervention that can be explored in the management for depression and anxiety.

Method: A short-term physical activity programme was given to 70 children (27 males, 43 females) aged 12-16 years who fulfilled the criteria for anxiety and depression on 3 scales: SCARED, CES-DC and RCADS. The physical activity programme was given for 6 sessions over 2 weeks. Pre and post scores of the three scales were noted.

Results: There was a 12.4% reduction in the scores of CES-DC, 13.35% on SCARED and 10% reduction in the scores of RCADS post-intervention. (p<0.05)

Conclusion: There was a significant reduction in the anxiety and depression levels after the physical activity program. Physical activity has a positive effect in reducing depression and anxiety in adolescents.

Keywords: adolescents, anxiety, depression, Physical activity.

Introduction

Mental health disorders pose an emotional, social, academic burden on the children as well as their parents and families. The prevalence of psychiatric disorders was found to be ranging from 6.33% to as far as 46% in school based studies. Studies have shown that 1 in 3 children and/or adolescents may have one or more psychiatric disorder by the age of 16 years.

Depression and anxiety are the most common mental health disorders affecting the adolescents and student population. Clinic based studies reported 1.2% to 9.2% incidence of affect disorders in children amongst which unipolar depression was the most common.

According to WHO, Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration. Merriam-Webster defines anxiety as an abnormal and overwhelming sense of apprehension and fear often marked by physical signs (such as tension, sweating, and increased pulse rate), by doubt concerning the reality and nature of the threat, and by self-doubt about one’s capacity to cope with it. The signs and symptoms of generalized anxiety disorder according to National Institute of Mental Health are: restlessness or feeling wound-up or on edge, being easily fatigued, difficulty concentrating or having their minds go blank, irritability, muscle tension, difficulty controlling the worry, sleep problems (difficulty falling or staying asleep or restless, unsatisfying sleep).

The risk factors for depression and anxiety in children are gender (females are more prone to develop...
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anxiety), age, temperament, parental factors, cultural factors, toxic environment, negative life experiences/adversities, parental loss, sexual abuse, peer violence, etc. This increases social withdrawal and suicidal tendencies.

Commonly used treatments for mental disorders include psychotherapy and pharmacotherapy for diagnosed cases. But attention is not paid to the subclinical cases which are just falling in the pit of depression and anxiety disorders. Screening at the appropriate time will help us to know the subclinical cases which can be prevented to go into terminal cases. Non-pharmacological therapy has been proved to be useful in various studies by improving the mental status of the individual.

The role of Physiotherapy in mental health is to provide motivation, promote wellness and address associated co-morbidities by designing exercise programs. There is evidence that improving the physical well-being also improves security and self-esteem. Physical activity has shown to provide positive effects in improving mental health but the study designs were poor with long term interventions and there was a need for further research. Hence this study was conducted to observe the short term effects of physical activity on depression and anxiety in adolescents.

OBJECTIVES: To screen for the incidence of depression and anxiety in adolescents.

To find the short term effect of physical activity on depression and anxiety in adolescents.

Methodology

Single group pre-post interventional study. Ethical clearance was obtained by Institutional Ethical Committee. All participants provided an appropriate informed assent/consent.

Participants: Subjects were recruited from various schools of Belagavi city. After obtaining permission from the school authorities, children attending regular school in the age group of 12-16 years were screened for depression and anxiety using the SCARED, CES-DC and RACDS scales. The subjects who scored >15 on CES-DC, >25 on SCARED willing to participate were included in the study.

Children with physical contraindications to exercise, children with diagnosed psychiatric disorders, lack of willingness to exercise and children with recent infections and illness in the past month were excluded from the study.

Procedure

A brief demographic data of the participants such as age, gender, class along their family characteristics was obtained. The participants were given a 2 week physical activity programme for 30 minutes, 3 days/week on alternate days at the same time every session. The physical activity programme was given by a Physiotherapist to a group of 10 children at a time.

Intervention: The exercises were conducted on the school playground. The physical activity protocol included: warm up exercises for the first 5-7 minutes (arm circles, hand slaps, arms overhead, shoulder rotation, trunk side bends, trunk rotations, trunk bends, squats, single leg lunges and trunk forward bends- 5 repetitions each). Physical activity phase was for 30 minutes which included exercises in a progressive manner as: First week- Shuttle run between two cones placed at a distance of 15m - 10 rounds, hopping- 50 hops on each leg, jumping jacks- 20 repetitions, skipping- 50 skips. Second week: Shuttle run between two cones placed at a distance of 15m - 15 rounds, hopping- 50 hops on each leg, jumping jacks- 30 repetitions, skipping- 100 skips. The cool down phase lasted for 5-7 minutes with: light jogging, spot marching, heel raises (5 repetitions), Head tilts (5 repetitions), shoulder shrugs (5 repetitions), breathing exercises, trunk rotations (5 repetitions), ankle movements (5 repetitions).

Screening for depression and anxiety was done by using Screen for Child Anxiety Related Disorders, Center for Epidemiological Studies-Depression scale for Children and Revised Children’s Anxiety and Depression Scale

The CES-DC is an inventory of 20 self-report items regarding depressive symptoms. Each item asks how often a symptom has occurred within the last week. Response choices are assigned point values, which are added together to determine a total measure score. Response choices for each item and their corresponding point values are as follows:0 points: “Not at all”, 1 point: “A little”, 2 points: “Some”, 3 points: “A lot”. A few items are scored in opposite order which reflect positive affect. Scores on the CES-DC range from 0 to
60, in which higher scores suggest a greater presence of depressive symptoms. A score of 15 or higher is interpreted to indicate a risk for depression.

The SCARED consists of 41 items and 5 factors that parallel the DSM-IV classification of anxiety disorders. Response choices for each item and their corresponding point values are as follows: 0 points: “Not True or hardly ever true”, 1 point: “Somewhat true or sometimes true”, 2 points: “Very true or often true”. Interpretation: Total scores of >25 indicate the presence of anxiety disorder.

RCADS is a 47-item, youth self-report questionnaire with subscales including: separation anxiety disorder (SAD), social phobia (SP), generalized anxiety disorder (GAD), panic disorder (PD), obsessive compulsive disorder (OCD), and major depressive disorder (MDD). It also yields a Total Anxiety Scale (sum of the 5 anxiety subscales) and a Total Internalizing Scale (sum of all 6 subscales). Items are rated on a 4-point Likert-scale from 0 (“never”) to 3 (“always”).

Statistical Analysis: Analysis was done using SPSS 21. Normality tests of the change in pre-test and post-test scores was done by Kolmogorov Smirnov test. The data following normal distribution were analysed using dependent-t test. For the data that did not follow normal distribution, Wilcoxon matched paired test was applied. For the difference in scores between gender, ANOVA was used.

Results

Sample characteristics:

70 subjects (22.15%) out of 316 screened were found to have depression and anxiety symptoms. Out of the total sample, 61.43% were females and 38.57% were males (Table 1). 58% of the participants were in the first sibling position in their families. 70% of the participants belonged to a nuclear family.

SCARED-After intervention, there was a reduction in the scores of SCARED with a mean difference of 5.41 points between the pre (mean=40.54) and post (mean=35.13) scores (Table 2). There was a highly significant difference in the anxiety levels of the subjects as indicated by a decrease in scores by 13.35% (p<0.0001).

CES-DC- There was a mean difference of 4.37 points between pre (mean=35.26) and post (mean=30.89). There was a 12.4% of reduction in the scores of CES-DC post physical activity which is highly significant.(p<0.0001)

All the components of RCADS had a significant decrease in the scores post intervention. The MDD (7.16%), GAD (9.45%), OCD (9.14%), PD (9.61%), SAD(7.59%), SP (7.59%) showed highly significant differences post intervention. (p<0.0001)

The total anxiety score reduced by a mean of 7.37 points, with a difference of 10.76% which is highly significant.(p<0.0001) The anxiety depression scores reduced by a difference of 10.19%. (p<0.0001).

There was no difference in the scores between males and females in total anxiety and anxiety-depression scores pre-intervention and post-intervention (p>0.05). (Table 3)

Table 1: Baseline characteristics of population

<table>
<thead>
<tr>
<th>Factors</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td>12 yrs</td>
<td>11</td>
<td>15.71</td>
</tr>
<tr>
<td>13 yrs</td>
<td>16</td>
<td>22.86</td>
</tr>
<tr>
<td>14 yrs</td>
<td>16</td>
<td>22.86</td>
</tr>
<tr>
<td>15 yrs</td>
<td>20</td>
<td>28.57</td>
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<tr>
<td>16 yrs</td>
<td>7</td>
<td>10.00</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>38.57</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>61.43</td>
</tr>
<tr>
<td>Family type</td>
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<td>Joint</td>
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<td>30</td>
</tr>
<tr>
<td>Nuclear</td>
<td>49</td>
<td>70</td>
</tr>
<tr>
<td>Sibling Position</td>
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<td></td>
</tr>
<tr>
<td>One</td>
<td>41</td>
<td>58.57</td>
</tr>
<tr>
<td>Two</td>
<td>29</td>
<td>41.43</td>
</tr>
<tr>
<td>Screened</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With anxiety and depression</td>
<td>70</td>
<td>22.15</td>
</tr>
<tr>
<td>Without anxiety and depression</td>
<td>246</td>
<td>77.85</td>
</tr>
</tbody>
</table>
Table 2: Comparison of pre-test and post-test values of outcome measures

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Pretest</th>
<th>Post test</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CES-DC</td>
<td>35.26±8.75</td>
<td>30.89±8.99</td>
<td>0.0001*</td>
</tr>
<tr>
<td>SCARED</td>
<td>40.54±9.27</td>
<td>35.13±9.89</td>
<td>0.0001*</td>
</tr>
<tr>
<td>RCADS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total anxiety scores</td>
<td>68.51±8.81</td>
<td>61.14±7.56</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Anxiety-depression</td>
<td>60.44±8.16</td>
<td>54.29±6.98</td>
<td>0.0001*</td>
</tr>
<tr>
<td>MDD</td>
<td>66.64±5.75</td>
<td>61.87±6.09</td>
<td>0.0001*</td>
</tr>
<tr>
<td>GAD</td>
<td>68.14±4.83</td>
<td>61.70±6.23</td>
<td>0.0001*</td>
</tr>
<tr>
<td>OCD</td>
<td>77.24±9.15</td>
<td>70.19±9.19</td>
<td>0.0001*</td>
</tr>
<tr>
<td>PD</td>
<td>83.23±9.81</td>
<td>75.23±10.13</td>
<td>0.0001*</td>
</tr>
<tr>
<td>SAD</td>
<td>78.26±7.30</td>
<td>72.31±7.77</td>
<td>0.0001*</td>
</tr>
<tr>
<td>SP</td>
<td>53.24±4.17</td>
<td>49.20±4.01</td>
<td>0.0001*</td>
</tr>
</tbody>
</table>

*p<0.05 significant

Table 3: Comparison of gender with pretest and posttest anxiety and anxiety-depression scores by t test

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety scores: Pretest</td>
<td>68.74±7.70</td>
<td>68.37±9.53</td>
<td>0.8661</td>
</tr>
<tr>
<td>Post test scores</td>
<td>60.89±7.09</td>
<td>60.16±8.83</td>
<td>0.8436</td>
</tr>
<tr>
<td>Anxiety-depression: Pretest scores</td>
<td>60.89±7.09</td>
<td>60.16±8.83</td>
<td>0.7199</td>
</tr>
<tr>
<td>Post test scores</td>
<td>54.74±6.28</td>
<td>54.00±7.45</td>
<td>0.6689</td>
</tr>
</tbody>
</table>

Values are given in mean±SD *p<0.05 significant

Discussion

Children with depression and anxiety showed a significant reduction in their symptoms after the 2 week physical activity programme. Given that there is a high prevalence of depression and anxiety in adolescent age group, these results are important. The results of the present study are consistent with existing research that physical activity has antidepressant and anxiolytic effects.

The psychological effects of exercise are best seen when the mental health status is poor prior to the exercise, as in case of depression and anxiety. Physical activity has shown to improve the mental status of the children. In our study, after screening, depression and
anxiety was found more in females as compared to males. However, when subjected to physical activity, no gender interactions were seen\textsuperscript{12}.

All subjects completed the 2 week supervised physical activity programme with no absenteeism. Conducting the physical activity sessions during the school time at the playground gave a good compliance. As the intervention was conducted in a playful manner, there was no direct address to their problems which could further worsen the symptoms. In depression and anxiety, social withdrawal is one of the most commonly seen symptoms. A potential impact on the psychological status has been established by group exercises rather than individualized sessions\textsuperscript{19}. Our study intervention was given in supervised group session which also served as a medium to improve their social interactions, which has been proved to have an antidepressant and anxiolytic effect.

A healthy body leads to a healthy mind and vice versa. Physical activity has various physiological effects that also play a role in improving the psychological outcomes of an individual. Higher physical activity levels have shown to reduce the depression and anxiety symptoms\textsuperscript{20}. Good mental health in turn helps to maintain a good physical health which improves the overall performance and quality of life, cutting down on the health-care expenses.

Physical activity can be routinely included in the lifestyle of adolescents which will help to improve their mental health status. This will also prove useful in avoiding complications related to psychological disorders such as lethargy, obesity etc. Further, psychologists and psychiatrists dealing with depression and anxiety should consider physical activity as a part of therapy.

The present study has several limitations. Firstly, other factors that contribute to depression and anxiety were not considered. Secondly, stressors such as an upcoming examination or conflicts were not noted in the study. Pre-menstrual syndrome and the menstruation period was not considered in case of females while assessing for their depression and anxiety symptoms. Finally, a follow up of their mental health status was not taken after intervention. Further research could be done to find gender interactions and follow up effect of physical activity on depression and anxiety.

**Conclusion**

There is a high prevalence of depression and anxiety among adolescents, which has negative consequences on health and functioning. Physical activity plays a significant role in reducing the symptoms of anxiety and depression. There is a positive effect of physical activity on the mental health of the adolescents with anxiety and depression.

**Abbreviations:** SCARED- Screen for Child Anxiety Related Disorders, CES-DC- Center for Epidemiological Studies-Depression scale for Children, RCADS- Revised Children’s Anxiety and Depression Scale

**Ethical approval:** Obtained from Institutional Ethical Committee

**Funding:** No financial or nonfinancial benefits have been received or will be received from any party related directly or indirectly to the subject of this article

**Statement of Consent:** Informed consent was obtained from all subjects.

Statement of Human and Animal Rights: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5).

**Conflict of Interest:** None

**References**


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Functional Path of Closure of Mandible and its Association With Temporomandibular Disorders - A Case Control Study

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Abstract

Introduction: The significance of occlusion and its importance as a causative factor and aggravator of temporomandibular disorders (TMD) is a much debated subject. Objectives: The primary objective of this study was to investigate the association between varying path of closure and TMD. Materials and Method: 90 subjects aged from 12 to 25 year subjects were divided into four groups comprising patients exhibiting forward, backward, lateral and normal path of closure. The Helkimo Anamnestic and Dysfunction Index modified by Athanasiou and Melsen (HI) was used for the clinical evaluation of the temporomandibular joint (TMJ) in order to classify the TMD and the amount of severity. Results: Patients having an altered path of closure of the showed substantially higher scores of Helkimo Anamnestic index. Among the three different subject groups more severe form of TMD were associated with the forward path of closure followed by backward, and then lateral path of closure. Conclusion: Patients having an altered path of closure of the mandible showed increased association with TMD as compared to the patients having the normal path of closure which makes it imperative to evaluate the TMJ in patients with altered path of closure.

Keywords- Malocclusion, Mandible, Temporomandibular Joint Disorders.

Introduction

Temporomandibular disorders (TMD) are “a group of conditions which have many signs and symptoms that affect the temporomandibular joints (TMJ), the muscles of mastication, or both.” TMD is most of the time considered to be a single syndrome, but the current modern view is that TMD is a group of various linked disorders with many similar characteristics. TMD are more usually seen in the adult population and 1/3 of adult population have at least one symptom, which consists of either agony in jawbone or neck, headache and clicking sound or discordance within the joint region. Several theories have suggested that the functional problems and the morphological malocclusion have been related to be the cause of the TMD. Accomplishment of an ideal occlusion through orthodontic therapy or adjustments in the occlusion can help to get rid of the pain and dysfunction, and ordinary working of the masticatory framework relies upon the coordinated functioning of the TMJ. Hidaka, Roth and Corday and others have emphasized on the significance of orthodontists going for functional occlusion where centric relation and centric occlusion correspond.

The significance of occlusion and its importance in the causative factor and aggravation of TMD, compared with other sources, have been dealt in detail but it is still debatable in the present scenario also. Patients who have altered occlusions are thought to have more chances of TMD as compared to those who have a normal occlusion. So, the primary objective of this study was to investigate the association between varying path of closure and
Temporomandibular disorders.

**Materials and Methodology**

The Study was a case-control in vivo study. The sample was decided based on previous data and with the power of sample set at 95% and 95% confidence interval the sample size arrived at was 90. Ethical clearance was taken from the Institutional ethics committee. Patients selected for this study, were then divided into 4 groups as following-1st group comprising patients exhibiting forward path of closure, 2nd group with backward path of closure, 3rd group with lateral path of closure and 4th group with normal path of closure which formed the control group. Study duration extended from January 2015 to December 2016. The present study had the following inclusion and exclusion criteria:

**Inclusion criteria:** No previous history of orthodontic treatment, presence of more than 10 teeth in every arch, no prosthesis to be present in the patient’s mouth and age group from 12 to 25 year.

**Exclusion criteria:** Osteoarthritis of TMJ, Tumors in the temporomandibular joint region, congenital craniofacial syndromes, traumatic injuries of the TMJ, pregnant patients.

At the initial appointment, patients were assessed for the path of closure by the researcher and the co-researcher in order to remove the observer bias all the patients were reassessed by the co examiner. Subjects who met the inclusion criteria were included until a sample of 90 eligible subjects were identified i.e.15 subjects each with Forward path of closure, Backward path of closure and Lateral path of closure, 45 subjects with Normal path of closure. The Helkimo Anamnestic and Dysfunction Index modified by Athanasiou and Melsen (HI) was used for the clinical evaluation of the TMJ, which evaluated the mandibular range of motion, proper functioning of the TMJ, and presence of any joint or muscle pain, in order to classify the temporomandibular joint disorder and the amount of severity. The Helkimo Index modified by Athanasiou and Melsen which was used in our study helped to evaluate the TMJ for:

The mobility of the mandible (Figure a)

i) Normal = 0

ii) Reduced = 1

iii) Severely reduced = 2

The functioning of TMJ (Figure b)

i) Plane movement without sounds and deviations < 2 mm = 0

ii) Sounds in one or both joints and/or deviations > 2 mm = 1

iii) Locking or luxation = 5

Pain in the muscles (Figure c)

i) No pain on palpation = 0

ii) Pain on palpation at one to three sites = 1

iii) Pain at four or more palpation sites = 5

Pain in the TMJ region

i) No pain on palpation = 0

ii) Lateral aspect pain = 1

iii) Distal aspect pain = 5.

The sum of scores was used to evaluate the TMJ function as

Normal TMJ function (score 0),

Moderate TMD (score 1-4)

Severe TMD (score 5-20)

The test results obtained were statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 20. The mean, median and standard deviations of TMD and different path of closure were calculated. The association between TMD and different path of closure were assessed using Kruskal Wallis test and Posthoc Bonferroni’s test. Qualitative analysis was done using the Chi-Square test.

**Results**

Patients having an altered path of closure of the mandible i.e. forward, backward or the lateral path of closure of the mandible showed substantially higher scores of Helkimo Anamnestic index which signifies association of path of closure of the mandible with the TMD. Among the three different subject groups of path of closure of the mandible, more severe form of TMDS were associated with the forward path of closure with a maximum score of 9 and a mean value of 4.3, followed by backward path of closure with the maximum score of 7 and a mean value of 4.0, and then lateral path of closure subjects with a maximum score of 4 and mean value of 1.5 (Table 1). The result (Table 2) shows an association of TMD with the subjects having a forward and backward path of closure as compared to subjects
having a normal path of closure of the mandible. The qualitative analysis (Table 3) shows significant co-relation of the TMD with the subjects having an altered path of closure as compared to the subjects having a normal path of closure of the mandible.

Table 1: Kruskal Wallis test to compare the association of TMDS with subjects having Normal path of closure and subjects with altered path of closure of the mandible

<table>
<thead>
<tr>
<th>Sample1</th>
<th>Sample2</th>
<th>Test Statistic</th>
<th>Std. Error</th>
<th>Std. Test Statistic</th>
<th>Sig.</th>
<th>Adj.Sig.</th>
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<tr>
<td>NORMAL-LATERAL</td>
<td></td>
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<td>7.605</td>
<td>-1.427</td>
<td>.153</td>
<td>.921</td>
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<td>-4.311</td>
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<td>.000</td>
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<tr>
<td>NORMAL-FORWARD</td>
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<td>-37.089</td>
<td>7.605</td>
<td>-4.877</td>
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<td>.000</td>
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<td>LATERAL-FORWARD</td>
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<td>26.233</td>
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<td>BACKWARD-FORWARD</td>
<td></td>
<td>4.300</td>
<td>9.315</td>
<td>.462</td>
<td>.644</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 2: Posthoc Bonferroni’s Test to compare the co-relation of TMDS with normal path of closure and with altered path of closure of the mandible

<table>
<thead>
<tr>
<th>DIRECTION</th>
<th>Mean</th>
<th>Median</th>
<th>Percentile 25</th>
<th>Percentile 75</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Chi-Square</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>1.1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORWARD</td>
<td>4.3</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>34.168</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LATERAL</td>
<td>1.5</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BACKWARD</td>
<td>4.4</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 3: Shows cross tabulation of the subjects with Normal path of closure and subjects with altered path of closure i.e. Forward, Backward and Lateral path of closure.

<table>
<thead>
<tr>
<th>PATH OF CLOSURE</th>
<th>GROUP</th>
<th>Count</th>
<th>% within GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL PATH OF CLOSURE</td>
<td>NORMAL</td>
<td>6</td>
<td>40.0%</td>
</tr>
<tr>
<td>MODERATE TMD</td>
<td>9</td>
<td>60.0%</td>
<td></td>
</tr>
<tr>
<td>SEVERE TMD</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>BACKWARD PATH OF CLOSURE</td>
<td>TOTAL</td>
<td>15</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PATH OF CLOSURE</th>
<th>GROUP</th>
<th>Count</th>
<th>% within GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL PATH OF CLOSURE</td>
<td>NORMAL</td>
<td>7</td>
<td>46.7%</td>
</tr>
<tr>
<td>MODERATE TMD</td>
<td>8</td>
<td>53.3%</td>
<td></td>
</tr>
<tr>
<td>SEVERE TMD</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>FORWARD PATH OF CLOSURE</td>
<td>TOTAL</td>
<td>15</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PATH OF CLOSURE</th>
<th>GROUP</th>
<th>Count</th>
<th>% within GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL PATH OF CLOSURE</td>
<td>NORMAL</td>
<td>8</td>
<td>53.3%</td>
</tr>
<tr>
<td>MODERATE TMD</td>
<td>5</td>
<td>33.3%</td>
<td></td>
</tr>
<tr>
<td>SEVERE TMD</td>
<td>2</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td>LATERAL PATH OF CLOSURE</td>
<td>TOTAL</td>
<td>15</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Discussion

Temporomandibular Disorder (TMD) is the main cause of pain of non-dental origin in the oro-facial region including head, face and related structures. The etiology and the pathophysiology of TMD are poorly understood. It is generally accepted that the etiology is multifactorial, involving a large number of direct and indirect causal factors. Among such factors, occlusion is frequently cited as one of the major etiological factors causing TMD. It is well known from epidemiologic studies that TMD-related signs and symptoms, particularly temporomandibular joint (TMJ) sounds, are frequently found in children and adolescents and show increased prevalence among subjects between 10 and 45 years old.⁵
Many studies have focused on the TMJ relationships of patients with various malocclusions. The current study focused on the relationships of the TMD with the altered path of closure of the mandible. It is important to find out if there is an underlying TMD before the beginning of any irreversible treatment.

Bakke advocated that even though there is much argument in the literature regarding the importance of occlusion in TMD, still there is no doubt that occlusal discrepancies like malocclusion, occlusal prematurities etc. alters the normal masticatory muscle activity. The current study reports a significant influence of altered path of closure of the mandible on signs of TMD. Thilander et al. established that TMD are more commonly linked with posterior crossbite, anterior open bite, Angle Class III malocclusion, and extreme maxillary overjet (positive/negative). Now the doubt comes if proper measures are taken i.e. proper treatment is provided to correct the malocclusion in such cases, will it prevent the development of TMD or will reduce the incidence of TMD is still a matter of debate as we know that mandibular dysfunction can be caused due to various reasons.

Irrespective of the cause-effect association, it is necessary to figure out the patients who have TMD before commencement of any irreversible form of treatment, which includes orthodontic therapy, since TMD affirmative signs and symptoms which may develop during or after the therapy might be considered to be a consequence of the therapy provided.

In the current study there has been a significant correlation between the altered path of closure of the mandible and the TMD. Temporomandibular disorder signs and symptoms fluctuate unpredictably, indicating an increased demand for evaluating TMJ of patients with malocclusions. As stated by Michalak et al. along with establishing the type of malocclusion it is important to determine the occurrence of parafunctions, as they can lead to changes in the TMJ. Riolo ML reported that positive association was present with certain type of malocclusion and TMD. They found out that negative association is present in relation to TMD and functional shift of occlusion but they found positive relation of TMD with various other malocclusions like open bite, and class II malocclusions. On the other hand Pullinger et al. found positive association in relation to the TMD and functional shift of the occlusion. They also found out that luxation and clicking of the joint is not commonly present in the class II division II malocclusion but it is present when posterior cross bite is present and it is more common when the posterior crossbite is unilateral. In their study they used Helkimo Anamnestic index to evaluate the TMJ which is the same index that is used in the current study for the evaluation of temporomandibular joint. Fuentes et al. stated that position of the condyle in the glenoid fossa is altered by the functional shift of the occlusion leading to TMD which is in concurrence with the current study.

Kerstein and Grundset defined occlusion time as the time between the first occlusal contact and the reaching of the complete habitual intercuspation. The occlusion time length can be correlated to the existence of premature occlusal contacts, and occlusal instability when closing into complete intercuspation. In their study, subjects with TMD showed significant differences from the control group who presented without TMD symptoms. In fact, the subjects affected by TMD had Occlusion times about 0.18 s longer than the non-TMD subjects. This signifies that patients in whom occlusal prematurities are present leads to altered path of closure of the mandible which is associated with TMD. In fact, premature contacts can result in condylar displacement, which may cause friction and increased intra-articular pressure on the TMJ, contributing to alteration of the disc position on the condyle, possibly leading to the onset of TMD that can have negative effects on muscle activity levels.

The etiologic importance of malocclusion on the development of TMD must be viewed with this in mind. In addition to malocclusion other variables such as psychological health and muscle endurances have shown to be strongly associated with TMD. As it has already been proven in the literature, these variables were not included in the current study which can be attributed as a probable limitation of the current study.

**Conclusion**

Patients having an altered path of closure of the mandible i.e. forward path of closure, backward path of closure, and lateral path of closure of the mandible showed increased association with TMD as compared to the patients having the normal path of closure of the mandible. Among the groups of patients having an altered path of closure of the mandible the maximum
severity of TMD were present in the patients having the forward path of closure of the mandible and least severe form of TMD were associated in the group of patients having the lateral path of closure of the mandible. In this digital era where proper diagnostic aids such as CBCT and MRI are present for the evaluation of TMJ, appropriate precaution should be taken before the start of the orthodontic treatment. It is imperative to evaluate the TMJ in patients having altered path of closure of the mandible as they present with increased incidence of TMD. Therefore evaluation of the temporomandibular joint (TMJ) during and after the orthodontic therapy is essential to avoid the development of temporomandibular joint disorders (TMD).

Ethical Clearance- Taken from Institutional ethics committee.

Source of Funding- Self

Conflict of Interest - Nil

References


Effectiveness of an Educational Intervention Programme on Knowledge, Attitude and Practice of School Children Regarding Prevention of Hypertension

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Abstract

A study was conducted to find out the effectiveness of an educational intervention programme on knowledge, attitude and practice regarding prevention of hypertension among school children from selected schools of Kerala. Objectives of the study: (1) To find out the effectiveness of an educational intervention programme on knowledge, attitude and practice of school children regarding prevention of hypertension (2) To find out the correlation between knowledge, attitude and practice (3) To find out the association of knowledge, attitude and practice with selected variables. Methodology & Design: Evaluative research approach with pre-test post-test control group design was used. 220 school children with pre hypertension in the age group of 13-16 years studying in 8th and 9th standards were included using simple random sampling in the study. An educational intervention programme aimed at diet, exercise and lifestyle modifications of school children was then implemented. Results: The overall pre test knowledge score was 14.97 ± 5.06 in the control group and 15.37 ± 5.47 in the experimental group. Also it was seen that majority of school children in the control group (84%) and experimental group (75%) were having a favourable attitude on prevention of hypertension. And almost half of the school children in the control group (47.2%) and experimental group (48.1%) were having a fair practice on prevention of hypertension. After the intervention there was a significant difference between the post test knowledge and attitude scores of the control and experimental groups. The practice score also was significantly improved. Conclusion: The results of the present study is very much encouraging that similar programmes can definitely help in controlling life style diseases among children which is an emerging public health problem.

Keywords: Blood pressure, pre hypertension, knowledge, attitude, practice, school children, educational intervention programme.

Introduction

The corner stone in the building up of a healthy nation is the group of healthy children in that country. The foundation of many adulthood diseases including hypertension are laid in the childhood itself. It is a known fact that blood pressure (BP) increases consistently from infancy to adolescence. The present generation is having a lifestyle which makes them prone to these types of conditions. Elevated blood pressure in children and adolescents may be an early expression of essential hypertension in adulthood¹. It is identified that hypertension is a major health problem globally and is an important risk factor for the development of coronary artery disease and stroke². It was also estimated that around 1 billion of the adult world population was hypertensive in the year 2000 and this is expected to increase 1.56 billion by 2025.³ Though it is mostly a problem of adults, the etiologic process starts in childhood. Studies have documented a 1-2% prevalence

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of childhood hypertension in the developed countries and 5-10% in the developing countries. Various Indian studies have also shown a prevalence which ranges from 0.96% to 11.4%. A cross sectional study was done to find the prevalence of sustained hypertension and pre hypertension among school children aged 11-17 years. A total of 1085 apparently healthy students from rural and urban schools from northern India were examined. Hypertension was identified in 62 (5.9%) children and pre hypertension in 130 (12.3%). The study concludes that nearly 20% of the school children had elevated blood pressures. Another study conducted among 24,842 school children from Kerala showed that 10.1% of children with normal weight, 17.34% of children with overweight and 18.32% of children who are obese were having hypertension. Another study was conducted to assess the prevalence of cardiovascular risk factors among school children of Delhi. In this cross sectional survey, it was found that the prevalence of pre hypertension, stage 1 hypertension and stage 2 hypertension was 12.4%, 6.8% and 1.4% respectively. The study concludes that there is a notable prevalence (20.4%) of pre hypertension and hypertension among the study group.

It is very evident from these studies that the prevalence of hypertension and pre hypertension is a matter of concern. This is a childhood antecedent of serious cardiovascular disease conditions at a later age. Therefore it is important that preventive measures be taken to reduce these risks and optimize the health outcomes. Early detection and prompt intervention are the two important strategies of reducing the morbidity and mortality rates of any disease conditions as well as in reducing the complications. The present study is one such attempt to find out the effectiveness of a school based educational intervention programme in reducing the future risks of hypertension among school children.

**Objectives of the Study were:**

To find out the effectiveness of an educational intervention programme on knowledge, attitude and practice of school children on prevention of hypertension to find out the correlation between knowledge, attitude and practice of school children on prevention of hypertension to find out the association between knowledge, attitude and practice with selected socio demographic variables.

**Methodology**

The research approach was evaluative approach with pre-test post-test control group design. The study was done among children in the age group of 13-16 years from selected schools of Ernakulam district of Kerala State. For this 220 (110 in experimental and 110 in control group) pre hypertensive school children were selected randomly. Students from 8th and 9th standards (age 13-16 years) were taken from ten schools selected randomly from Ernakulam district. After the screening 1328 children, 381 children were found to have pre systolic hypertension or pre diastolic hypertension (Pre SHT/ Pre DHT) with blood pressure between 90th and 95th percentile or both. All these pre hypertensive children were considered for the study. The ten schools were then randomly divided into two groups (control and experimental). 110 children from each group of schools were selected randomly for the study. After doing the baseline assessment, the educational intervention programme aimed at lifestyle modifications was implemented for the experimental group. Reinforcement of the educational programme was also done using an information leaflet at 4th and 8th months, only for the experimental group. Finally the knowledge, attitude and practice of both groups were checked at 12th month.

**Educational Intervention Programme:** A systematically planned educational programme which provides information on childhood hypertension and the measures to be taken to prevent the development of hypertension (healthy lifestyle practices including diet, exercise, stress reduction etc.) with an intention to improve the knowledge, attitude and practice of school children on prevention of hypertension. This programme was implemented through direct teaching in two sessions of 45 minutes each and supplemented by information leaflet.

**Ethical Clearance:** Ethical clearance was obtained from the Institutional Ethical Committee of Amrita Institute of Medical Sciences.

Data analysis was done on 210 samples (106 and 104 children respectively in the control and experimental groups, after attrition of 10 samples) using descriptive and inferential statistics.

**Results**

The overall pre test knowledge score was 14.97
± 5.06 (48.3%) in the control group and 15.37 ± 5.47 (49.6%) in the experimental group. The highest score was found in the area of prevention, with 75.9% in the control group and 64.9% in the experiment group. The lowest score was found in the area of symptoms of the disease, with 19.3% in the control group and 35.6% in experimental group. Majority of school children in the control group (70.8%) and experimental groups (61.5%) were having average knowledge on prevention of hypertension in the pretest. The percentage of school children having good knowledge on prevention of hypertension in the control and experimental groups were only 11.3% and 18.3% respectively. Also it was seen that majority of school children in the control group (84%) and experimental group (75%) were having a favourable attitude on prevention of hypertension. Regarding the practice it was seen that in the pre test almost half of the school children in the control group (47.2%) and experimental group (48.1%) were having a fair practice on prevention of hypertension.

Table 1 Mean, SD and t values of knowledge scores of school children regarding prevention of hypertension  

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Control group n=106</th>
<th>Experimental group n=104</th>
<th>df</th>
<th>t - value</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post test Knowledge scores of school children</td>
<td>15.63 ± 5.04</td>
<td>21.94 ± 3.13</td>
<td>176</td>
<td>11.19**</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level.

There was a significant difference between the post test knowledge scores of the control (15.63) and experimental (21.94) group (p<0.001). ANCOVA was done to confirm that the baseline knowledge scores have not affected the post test means of the knowledge scores of the control and experimental group. Accordingly after adjusting the post test means of knowledge scores, the experimental group had a higher mean knowledge score (21.79) than the control group (15.57) with F value 547.98 (p<0.001).

Table 2 Mean, SD and t values of attitude scores of school children regarding prevention of hypertension  

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Control group n=106</th>
<th>Experimental group n=104</th>
<th>df</th>
<th>t - value</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post test Attitude scores of school children</td>
<td>78.10 ± 12.53</td>
<td>87.96 ± 10.17</td>
<td>208</td>
<td>6.25**</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level.

There was a significant difference between the post test attitude scores of the control (78.10) and experimental (87.96) group (p<0.001). Results of ANCOVA shows that after adjusting the post test means of attitude scores, the experimental group had a higher mean attitude score (88.56) than the control group (77.52) with F value= 210.06 (p<0.001).
Table 3 Adjusted mean, SD and F values of practice scores of school children in the control and experimental group  
\(n=210\)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Total (n)</th>
<th>Adjusted post test mean</th>
<th>SD</th>
<th>F value</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>106</td>
<td>13.73</td>
<td>3.07</td>
<td>66.74**</td>
<td>1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Experimental</td>
<td>104</td>
<td>15.31</td>
<td>2.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level.

Results of ANCOVA shows that the experimental group had a higher mean practice score (15.31) than the control group (13.73) with F value= 66.74 (p=<0.001) indicating that the educational intervention programme was effective in improving the practice of school children towards prevention of hypertension.

Table 4 Correlation between knowledge and attitude of school children regarding prevention of hypertension  
\(n=210\)

<table>
<thead>
<tr>
<th>Variables</th>
<th>coefficient of correlation(r)</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>0.51**</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at 0.01 level.

Table 5 Correlation between knowledge and practice of school children regarding prevention of hypertension in the pre test  
\(n=210\)

<table>
<thead>
<tr>
<th>Variables</th>
<th>coefficient of correlation(r)</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>0.23**</td>
<td>0.001</td>
</tr>
<tr>
<td>Practice</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level.

Table 6 Correlation between attitude and practice of school children regarding prevention of hypertension  
\(n=210\)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>0.47**</td>
<td>0.000</td>
</tr>
<tr>
<td>Practice</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at 0.01 level.

Regarding the association, it was seen that there was a significant association between the knowledge of school children and their class of study, and location of school and family history of hypertension. No significant association was found between knowledge and age, gender, type of school, type of family, educational status of the parents, occupational status of the parents and type of food intake. Similarly, there was a significant association between the attitude of school children and their type of school. Also there was a significant association between the practice of school children and their type of school, location of school and educational status of the mother. No significant association was found between practice of school children and other variables under study.
Discussion

The aim of the study was to find out the effectiveness of an educational intervention programme on the knowledge, attitude and practice of school children towards prevention of hypertension. The focus of intervention in the present study was not on the children who are already hypertensive who need to take definitive treatment. The study was an attempt towards reducing the chances of hypertension by modifying the lifestyle of school children. Lack of adequate knowledge about hypertension and its contributing factors also was a problem in school children. The educational intervention programme was effective in improving the knowledge of the children about hypertension and its consequences which in turn had an influence on their attitude. Attitudinal change is the preliminary factor which makes a change in the practices. The intervention by the investigator could make a positive impact in this direction. It gives a ray of hope that a definite change can be made with collective effort on a large scale.

The educational intervention programme was aimed at improvement of the knowledge and attitude of the children thereby developing a healthy lifestyle practice. Several such attempts are made by many researchers elsewhere but hardly very few efforts were done in the local settings of Kerala with regard to childhood hypertension. The present study findings are in congruence with the results of studies conducted by Grad I, Jan S et.al, Taha AZ, Meagher D, Yan Ping Wan, P.D Angelopoulose et.al, McMurray et.al, Subramanian H et.al, and Cai L et.al.

The findings of the present study show that hypertension among school children is a health concern not only of the developed countries but of developing countries like India. Life style modifications will definitely have an impact in reducing such health problems. This can be facilitated through educational interventions which can improve the knowledge, attitude and practices of school children.

Conclusion

The study was an attempt towards reducing the chances of hypertension by modifying the lifestyle of school children. The educational intervention programme was effective in improving the knowledge and attitude of school children thereby improving the practices. The present study could achieve its objectives. This was a good attempt in addressing a very important and emerging health problem among children. The results of the study were in congruence with the findings of the results of the previous researches.

Conflict of Interest: - Nil

Sources of Funding:- Self

References


A Study to Assess the Effect of School based Education on Knowledge and Perception of Teachers Regarding Safe School Environment at Selected Schools of Pune City

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Abstract

Background: A healthier school environment is one in which the school setting in this environment, good nutrition, physical activity, basic safety, clean air and water, access to care, and education about making healthy choices allow students to thrive. In a healthy school, students learn through lessons and by example to value their own health and that of the environment. Controlling communicable disease in the school setting is of outmost importance.

Aim: To evaluate the effectiveness of school based education on knowledge and perception of teachers regarding safe school environment.

Method: A quantitative research approach was used in this study. Research design was Pre-experimental: pre-test post-test. The consent was taken from the subjects for participation in study. Sample size was 60 primary and secondary schools teachers. The 10 subjects in each group were Convenience sampling technique was used. Data was compiled and analysis was done by using inferential and descriptive statistics.

Result and Discussion: The purpose of the present study is to assess the knowledge and attitude of teachers regarding safe school environment of selected schools at Pune city, with a view to develop a structured planned teaching programmed. The present study indicate that the 48.6% of the teacher in pre-test poor knowledge and 56.0% in post –test of the teacher is better knowledge. According to the level of the perception, the study revealed that the 46.2% of the teacher in pre-test poor knowledge and 58.8% in post –test of the teacher is better knowledge. There is moderately positive coefficient of correlation between knowledge and perception of teachers towards safe school environment is 0.020

Summary and Conclusion: In summary, the school teachers knowledge and perception regarding safe school environment is 48.6% in before intervention and 51.4% is better knowledge and perception of school teachers after intervention

Keywords: School Base Education, Teachers, Safe School Environment.

Introduction

The word ‘teacher’ represents; transfer of the knowledge from the teacher to the taught. In fact, the foundation that builds a person’s life is to great extend is based on the knowledge, he gets from his teacher. If there is somebody other than parents who plays an important role in children development, they are the teachers.
to consider the perceptions teachers hold regarding safety at school.\textsuperscript{4}

Safe school environment in school is necessary to support the academic success of each child, giving them the opportunity to learn and achieve in a safe and nurturing environment school safety promotes increased learning feelings of school unity, higher level of pro-social behavior and decreased level of violence.\textsuperscript{5}

A healthier school environment is one in which the school setting supports students’ health and well-being and helps them build a strong foundation for learning. In this environment, good nutrition, physical activity, basic safety, clean air and water, access to care, and education about making healthy choices allow students to thrive. In a healthy school, students learn through lessons and by example to value their own health and that of the environment.\textsuperscript{6}

Controlling communicable disease in the school setting is of outmost importance.

Providing a safe, comfortable, and healthy environment facilitates the educational process, encourages social development, and allows children to acquire healthy attitudes towards school.

Children who are ill or feel unwell can create difficulties in the school setting. An ill child cannot always fully participate in class or educational activities. Worse yet, the child with a communicable disease may spread the illness o others. Accordingly, it is essential that educators help to control the spread of communicable disease by safe, effective, and practical efforts. Hand washing is the single most important way to prevent the spread of communicable diseases. Open the window to let the fresh air in, follow a good housekeeping schedule and disinfect in the proper way, do not share the personal items among children and keep their belongings separate, exclude sick children and staff.\textsuperscript{7}

**Objectives of the study**

- To assess the knowledge of teachers regarding safe school environment.
- To assess the perception of teachers regarding safe school environment.
- To evaluate the effectiveness of school based education on knowledge and perception of teachers regarding safe school environment.
- To find the association between knowledge and perception with selected demographic variable

**Hypothesis**

Research hypothesis (H1): There is significant association between school based education on knowledge and perception of teachers regarding safe school environment at selected school of Pune city.

Null hypothesis (H0): There is no significant association of school based education on knowledge and perception of teacher regarding safe school environment at selected school of Pune city

**Material amd Method**

A quantitative research approach was used in this study. Research design was Pre-experimental: pre-test post-test. The consent was taken from the subjects for participation in study. Sample size was 60 primary and secondary schools teachers. The 10 subjects in each group were Convenience sampling technique was used.

**Analysis and Interpretation**

This section deals with description of demographic variables of the study subject. The researcher analyzed and categorized the samples into various groups based on the socio demographic variables.

Frequency and Percentage Distribution of subject according to socio Demographic variables
Table 1: Description of samples (school teachers) based on their personal characteristics

Description of samples (school teachers) based on their personal characteristics in terms of frequency and percentages

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>43.3</td>
</tr>
<tr>
<td>Female</td>
<td>34</td>
<td>56.7</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>35</td>
<td>58.3</td>
</tr>
<tr>
<td>Muslim</td>
<td>13</td>
<td>21.7</td>
</tr>
<tr>
<td>Christian</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>46</td>
<td>76.7</td>
</tr>
<tr>
<td>Unmarried</td>
<td>9</td>
<td>15.0</td>
</tr>
<tr>
<td>Widow</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Class for teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>37</td>
<td>61.7</td>
</tr>
<tr>
<td>Secondary school</td>
<td>23</td>
<td>38.3</td>
</tr>
<tr>
<td>Income per month</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows the Depicts the majority of teachers 57% were females and 43.3% were males. We enrolled the 58.3% were belong to Hindu religion while 21.7% were belong to Muslim religion and the 16.7% were belong to Christian religion and 3.3 are others. Depicts the majority of the school teachers 76.7% were married, 15% of them were single, 8.3% were widow. 61.7% were primary school teachers 38.3% of them were secondary school teachers. Reveals that 48.3 of teachers had D.Ed., 36.7% had B.Ed., and 8.3% had Graduation in any stream and 6.7% of post graduation in any stream.

Table 2: Distribution of score knowledge and perception of total score by pre and post test

<table>
<thead>
<tr>
<th>Score</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>T-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge Score</td>
<td>6.08(2.657)</td>
<td>15.4(3.09)</td>
<td>19.315</td>
<td>0.001</td>
</tr>
<tr>
<td>Perception Score</td>
<td>6.4(1.4)</td>
<td>6.1(1.5)</td>
<td>1.02</td>
<td>0.308</td>
</tr>
<tr>
<td>Total score</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>Chi-Square test</td>
<td>P-value</td>
</tr>
<tr>
<td>Poor</td>
<td>15(57.7)</td>
<td>19(44.9)</td>
<td>0.889</td>
<td>0.020</td>
</tr>
<tr>
<td>Better</td>
<td>11(42.3)</td>
<td>15(55.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>17(48.6)</td>
<td>14(56.0)</td>
<td>0.322</td>
<td>0.570</td>
</tr>
<tr>
<td>Better</td>
<td>18(51.4)</td>
<td>11(44.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perception score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>20(58.8)</td>
<td>12(46.2)</td>
<td>0.950</td>
<td>0.330</td>
</tr>
<tr>
<td>Better</td>
<td>14(41.2)</td>
<td>14(53.8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 indicates that there is moderately positive coefficient of correlation between knowledge and perception of teachers towards safe school environment is 0.020. Hence $H_1$ is accepted.

The present study was undertaken to assess the knowledge and perception of teachers regarding safe school environment, with a view developing structured planned teaching programmed. The study significantly proved that there is a correlation between knowledge and perception. There another similar study conducted in Mangalore, which was published in the international journal of community medicine J P Majra., et al has conducted study on school environment and sanitation in rural India. The study was carried in rural areas of Mangalore Taluk in Dakshin Kannada District of Karnataka. A total of 20 randomly selected government schools were studied for their environment and sanitation facilities. Out of these twenty schools, four schools were primary schools, 14 were primary plus upper primary and two schools were from primary to high school level. Eighteen (90%) of the schools were overcrowded. Ventilation and day light was adequate for 12(60%) and 14(70%) of the schools respectively. Cleanliness of school compound/classrooms was adequate in 80% of the schools. There were no separate rooms for serving the midday meals in any of the schools under study. Eighteen (90%) of the schools were having drinking water points. Liquid and solid waste disposal was insanitary in six (30%) and eight (40%) of the schools respectively. Only half of the schools had adequate latrines for boys and 60% for girls. Only two (10%) of the schools had adequate hand washing points with soap. Environment and sanitation facilities at many of the schools are not fully satisfactory.

Discussion

The school teachers knowledge and perception regarding safe school environment is 48.6% in before intervention and 51.4% is better knowledge and perception of school teachers after intervention. Teachers’ knowledge of SHP are needed to improve the current suboptimal level of implementation. So it is important to provide information about training needs to upgrade the teacher’s knowledge and understanding in the component of safe school programme.

Conclusion

The school teachers knowledge and perception regarding safe school environment is 48.6% in before intervention and 51.4% is better knowledge and perception of school teachers after intervention.

Ethical Consideration: Ethical approval to conduct the study to obtained from the ethical committee of the Symbiosis college of nursing. Official permission was
obtained from the education department, Pune Municipal Corporation

**Conflict of Interest:** Nil

**Source of Funding:** Self

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A Study to Assess the Effectiveness of Povidone Iodine Ointment Versus Framycetin Sulphate Cream Over Episiotomy Wound Healing among Postnatal Mothers

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Abstract

Background: In India around 56% of women is undergoing for episiotomy in all vaginal deliveries and in Maharashtra the episiotomy rate is too high, as it ranges from 80% to 90% and in Pune the rate is about 80%.

Objective: To assess the effectiveness of Povidone Iodine Ointment versus Framycetin Sulphate Cream over episiotomy wound healing among postnatal mothers.

Methodology: Pre-experimental; one-shot case study design was used in this study and the total sample size was 40 (20 in experimental group-I and 20 in experimental group-II). The Experimental group-I was given the application of Povidone Iodine and the experimental group-II was given Framycetin Sulphate Cream. Healing of episiotomy wound was assessed by using a modified REEDA scale and the episiotomy Pain was assessed by Visual Analogue Scale amongst both the groups.

Results: In Povidone application group, the average change in REEDA score was 1.1 on day 2, 1.6 on day 3, 2.7 on day 4 and 3.2 on day 5. In Framycetin application group, average change in REEDA score was 0.6 on day 2, 1.7 on day 3, 2.5 on day 4 and 3.1 on day 5. t-values for these groups were 1.9, 0.1, 0.5 and 0.2 with 38 degrees of freedom. Corresponding to p-values were 0.034, 0.444, 0.305 and 0.405, which indicates that p-value is small (less than 0.05), the Povidone is significantly more effective as compared to Framycetin group. On day 3, day 4 and day 5, p-values are large (greater than 0.05), the difference between the effect of Povidone and Framycetin application is not significant.

Conclusion: Hence it can be concluded that the Povidone Iodine Ointment and the Framycetin Sulphate Cream are effective in healing of episiotomy wound. But Povidone iodine has more effective than Framycetin in the process of healing of episiotomy wound.

Keywords: Povidone Iodine Ointment, Framycetin Sulphate Cream, Episiotomy wound healing, postnatal mothers.

Introduction

The motherhood is seen as a God-giving role for this reason it is blessed, they way and manner societies conceptualize motherhood in a way has come to appreciation of general request because it is seen as a symbol of the national-state ¹.

Postnatal care (PNC) is the care given to the mother and her newborn baby immediately after the birth and for the first six weeks of life. This period marks the establishment of a new phase of family life for women and their partners and the beginning of the lifelong health record for newborn babies (or neonates — a term often used by doctors, nurses and midwives)².

The days and weeks following childbirth – the postnatal period – is a critical phase in the lives of mothers and newborn babies. Most maternal and infant deaths occur during this time. Yet, this is the most neglected period for the provision of quality care ³.
Management of the perineum is an important component of vaginal birth. In current obstetric practice, incision of the perineal body and vagina to enlarge the vaginal opening and facilitate delivery is referred to as an episiotomy. Couples have now become more involved in the decision-making process surrounding the birth of their infant and have questioned the routine use of technology during labor and delivery. Along with many other “routine” practices, the use of episiotomy has become controversial. Episiotomy can be midline or at an angle from the posterior end of the vulva, is performed under local anaesthesia and it is sutured closed after delivery. The type of episiotomy includes medico-lateral, median, and lateral and J shaped episiotomy. Among this medico-lateral episiotomy is done commonly. The nursing students should be taught the importance of relieving episiotomy pain and enhancing wound healing in postnatal mothers, and there is a need for extensive and intensive research in this area.

The first performance of episiotomy was done in 1742, when perineal incisions were used to facilitate deliveries. A systematic review available in the Cochrane Library showed that episiotomy is not only a procedure that should not be performed routinely but also it is both unnecessary and possibly harmful. Since the 2000s, selective episiotomy has been systematically recommended worldwide. The assumption for the decline in the number of episiotomies is discussed and confirmed, recalling that nowadays high rates of episiotomy remain in less industrialised countries and East Asia. According to the American college of Obstetrics and Gynaecology, approximately one in three women having a vaginal delivery also have an episiotomy. There is lack of data from India on the pattern of episiotomy use and its immediate complications among facility births.

Povidone-Iodine (betadine) is a broad spectrum antiseptic for topical application in the treatment and prevention of infections in wounds. It contains antibiotics that work by slowing or stopping the growth of bacteria and thereby promotes wound healing and relieves pain. Framycetin is a broad spectrum aminoglycoside antibiotic but not active against fungi, viruses, and most anaerobic bacteria.

The postnatal period refers to 6 weeks period after childbirth. The period is popularly termed the fourth trimester of pregnancy. Postnatal women are more prone for puerperal infection as a result of episiotomy which can be prevented by proper postnatal care. The researcher feels that midwives have an important role in care of perineal wounds following child birth.

Methodology

Pre-experimental; one-shot case study design was used in this study and the total sample size was 40 (20 in experimental group -I and 20 in experimental group -II). The Experimental group I was given the application of Povidone Iodine and the experimental group II was given group was given the Framycetin Sulphate Cream and it was administered for 5 days morning and evening. Healing of episiotomy wound was assessed by using modified REEDA scale and the episiotomy Pain was assessed by Visual Analogue Scale amongst both the groups. The participants of the study were selected by using non probability purposive sampling technique. The inclusion criteria were maintained as the postnatal mothers who had undergone full term normal vaginal delivery with episiotomy. The sample of 40 postnatal mothers was selected. Povidone Iodine ointment was administered to experimental group I and Framycetin Cream was administered to experimental group II with duration of in the morning and evening for four days. The demographic, obstetric and birth details were collected with the use of structured questionnaires. Formal Permission was obtained from PCMC for conduct of study in YCM hospital and this study is ethically approved from ethical committee of Symbiosis College of Nursing, Pune. Written informed consent was obtained from each participant at the time of recruitment to the study. Participants were provided adequate information about the study and ensured for confidentiality of their information and the voluntariness of participation in or withdrawal from the study.

Result

The data were analysed using the Descriptive and Inferential statistics. Researcher has applied paired t-test for assessing the effect of Povidone iodine ointment and Framycetin sulphate cream on episiotomy wound healing among postnatal mothers. The data were presented as absolute and relative frequencies, mean, standard deviation, and minimum and maximum values. The level of significance was set at less than 0.05.
Mean age in the Povidone iodine group was 45% of them had 22-25 years of age and in the Framycetin group was 60% of them had 22-25 years of age. Most of the women were housewives and held diploma or lower educational degrees. I regard to gestational age around 45% were 36-38 weeks among both groups. All participants had mediolateral episiotomy among two groups.

Average REEDA score on day1 was 3.9, 2.8 on day2, 2.3 on day 3, 1.2 on day 4 and 0.7 on day 5. t-value for these observations were 5.8, 6.5, 9.7 and 9.2 on day 2, day3, day 4 and day5 respectively with 19 degrees of freedom. (Table1) Corresponding p-values were of the order of 0.000, which were small (less than 0.05), the null hypothesis is rejected. This is evident that the Povidone iodine ointment on episiotomy wound healing among postnatal mothers is significantly effective.

<table>
<thead>
<tr>
<th>Day</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day1</td>
<td>3.9</td>
<td>1.18</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Day2</td>
<td>2.8</td>
<td>0.91</td>
<td>5.8</td>
<td>19</td>
<td>0.000</td>
</tr>
<tr>
<td>Day3</td>
<td>2.3</td>
<td>0.97</td>
<td>6.5</td>
<td>19</td>
<td>0.000</td>
</tr>
<tr>
<td>Day4</td>
<td>1.2</td>
<td>0.83</td>
<td>9.7</td>
<td>19</td>
<td>0.000</td>
</tr>
<tr>
<td>Day5</td>
<td>0.7</td>
<td>0.92</td>
<td>9.2</td>
<td>19</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Average REEDA score on day1 was 3.3 which was 2.8, 1.7, 0.9 and 0.3 on day2, day3, day4 and day5 respectively. T-value for this test were 2.5, 6.5, 8.9 and 13 on day2, day3, day4 and day5 respectively with 19 degrees of freedom (Table 2). Corresponding p-values were of the order of 0.000, which were small (less than 0.05), the null hypothesis is rejected. This is evident that the Framycetin sulphate Cream is significantly effective in improving the episiotomy wound healing among postnatal mothers.

<table>
<thead>
<tr>
<th>Day</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day1</td>
<td>3.3</td>
<td>1.03</td>
<td></td>
<td>19</td>
<td>0.012</td>
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<tr>
<td>Day2</td>
<td>2.8</td>
<td>1.07</td>
<td>2.5</td>
<td>19</td>
<td>0.000</td>
</tr>
<tr>
<td>Day3</td>
<td>1.7</td>
<td>1.04</td>
<td>6.5</td>
<td>19</td>
<td>0.000</td>
</tr>
<tr>
<td>Day4</td>
<td>0.9</td>
<td>0.88</td>
<td>8.9</td>
<td>19</td>
<td>0.000</td>
</tr>
<tr>
<td>Day5</td>
<td>0.3</td>
<td>0.44</td>
<td>13.0</td>
<td>19</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Researcher applied two sample t-test for the comparison of the effectiveness and duration of episiotomy wound healing on application of both Povidone iodine ointment and Framycetin Sulphate cream over episiotomy wound healing among postnatal mothers.

T-values for this comparison were 1.9, 0.1, 0.5 and 0.2 with 38 degrees of freedom. Corresponding p-values were 0.034, 0.444, 0.305 and 0.405, which indicate that p-value is small (less than 0.05), (Table 3) the Povidone is significantly more effective as compared to Framycetin group. On day3, day4 and day5, p-values are large (greater than 0.05), the difference between the effect of Povidone application and Framycetin application is not

Table 1: The effect of Povidone iodine ointment on episiotomy wound healing among postnatal mothers (group 1). n = 20

Table 2: The effect of Framycetin cream on episiotomy wound healing among postnatal mothers (group 2 ) n = 20

Table 3: The comparison of the effectiveness and duration of episiotomy wound healing on application of both Povidone iodine ointment and Framycetin Sulphate cream over episiotomy wound healing among postnatal mothers.
significant at day3, day4 and day5.

Though the Average effect of Povidone application is higher at all the time points that Framycetin application, the difference between the average effects of Povidone and Framycetin application is not significant.

Table: 3: Comparison of the effectiveness of application of both Povidone iodine ointment and Framycetin Sulphate cream over episiotomy

<table>
<thead>
<tr>
<th>Day</th>
<th>Povidone Mean</th>
<th>SD</th>
<th>Framycetin Mean</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day2</td>
<td>1.1</td>
<td>0.85</td>
<td>0.6</td>
<td>1.0</td>
<td>1.9</td>
<td>38</td>
<td>0.034</td>
</tr>
<tr>
<td>Day3</td>
<td>1.6</td>
<td>1.10</td>
<td>1.7</td>
<td>1.1</td>
<td>0.1</td>
<td>38</td>
<td>0.444</td>
</tr>
<tr>
<td>Day4</td>
<td>2.7</td>
<td>1.23</td>
<td>2.5</td>
<td>1.2</td>
<td>0.5</td>
<td>38</td>
<td>0.305</td>
</tr>
<tr>
<td>Day5</td>
<td>3.2</td>
<td>1.53</td>
<td>3.1</td>
<td>1.1</td>
<td>0.2</td>
<td>38</td>
<td>0.405</td>
</tr>
</tbody>
</table>

Since p-values corresponding to all the demographic variables are large (greater than 0.05), none of the demographic variables was found to have significant association with approximation.

Discussion

The results of the present study showed that the Povidone iodine ointment and Framycetin cream have similar effects on pain relief post episiotomy. A study conducted in 2016 conducted to assess the effectiveness of Povidone Iodine Sit bath versus Lavender Oil Sit bath on episiotomy pain and wound healing among postnatal mothers undergo normal vaginal delivery. The findings of the study shows that there was significant difference between the pre and post interventional level of episiotomy pain and wound healing among postnatal mothers undergo normal vaginal delivery. Like in the current study, it shows that Povidone iodine is effective for reducing the episiotomy pain and wound healing.

A Conducted a randomized clinical trial (2015) to assess the “Role of soap and water in the treatment of wound dehiscence compared to normal saline plus Povidone-iodine”, the result showed that there was no significant difference between the results of two groups. An Experimental study conducted,(2011) titled” Effect of Sodium fustigate, Framycetin sulphate on experimentally induced burn wound healing Sodium fustigate B and Framycetin A significantly decreased the duration of epithelialisation and increased % of wound contraction in comparison to the control group. The study showed that Framycetin possess significant wound healing58.In the present study also shows that the Framycetin application was effective for reducing the episiotomy pain and wound healing .In the present study though there is no significant difference in the Povidone iodine versus Framycetin cream.

Study findings revealed that though the average effect of Povidone application is higher at all the time points that Framycetin application, the difference between the average effects of Povidone and Framycetin application is not significant.

Conclusion

This study shows that the effectiveness of Povidone iodine and Framycetin cream was similar in post episiotomy pain relief. The application of both antibacterial agents is a simple, safe, and effective method for reducing the pain experienced by women following episiotomy within first, second, third, fourth and fifth days after childbirth. This study confirms analgesic and anti-inflammatory effect of Povidone iodine and Framycetin cream which has been reported in traditional medicine text books. Though the Average effect of Povidone application is higher at all the time points that Framycetin application, the difference between the average effects of Povidone and Framycetin application is not significant related pain and wound healing.

Conflict of Interest: Nil Declared

Source Funding: Self
Ethical Clearance: This study is ethically approved by Symbiosis College of nursing, Symbiosis International University

References


Mind Empowerment and Perennial Crops Cultivation

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Abstract

Agriculture is the backbone of Indian economy. 50% of the Indian population is depending on Agriculture and it contributes 17-18% to the country’s Gross domestic product (GDP). Among Indian states Tamil Nadu occupies the second position by producing Agricultural produces in a large scale basis. A country not only depends on physical factor alone for its economic development but also human development especially mental development. Scientific developments changed the traditional food habits and life style. The contaminated soil is poisoning the Agricultural products which intern poisoning human being especially human mind. Poor mental health weakens human’s capability & productivity which ultimately results in economic backwardness. Different methods are used to develop the mind power. This study demonstrates the empowerment of mental health through Agriculture, especially through the cultivation of Perennial crops like Mango & Banana.

Keywords – Agriculture, Perennial crops, Economic development & mental development.

Results

Mental health improvement can be done by improving the gut. Gut is being considered as the second Brain. Mango helps in boosting the power of gut. Bananas are naturally free of fat, sodium and cholesterol. Bananas are high in potassium, which helps the brain to transmit messages.

Introduction

Literally agriculture is the back bone of an economy whether it is developed or developing economy as its feeds the mankind and animals. Food is the major source of survival as well as growth of human body. Food not only facilitates the growth of human body but also it is detrimental to growth of human body if the food is excess, inadequate or in appropriate. Agricultural surplus not only leads to the development of trade and commerce but also it is a way of our lives and it is directly and indirectly facilitating the growth of human development physically and mentally. The crops that we cultivate bring harmony and ensure overall development of human body¹. That is why the authors made an attempt to analyse the significance of mango and banana cultivation on human development.

Research Objective

To analyze the role of Perennial crops in the development of mental health, in order to accelerate healthy Economy through mango and banana cultivation.

Review of literature

Kavitha.P, (2017) in her study stated that the Mangoes promote brain health and improve the concentration of mind. According to a study published in the journal Oxidative Medicine and Cellular Longevity, there are several components in mangoes that help increase cholinergic function and decrease oxidative stress. This, in turn, enhances memory. The glutamine acid provided by mangoes is also known to boost memory and promote mental alertness and mangoes contain vitamin B6, which is vital for maintaining and improving brain function.

Kanathur Smitha, B. Ramya Prabhu, Seranthimata Samshuddin and S. Dhiraj Kamath¹ concluded that the regular consumption of the standard recommended daily intake levels of the vitamins, mineral and other nutrients for our body needs is the first step in keeping a healthy physic and mind. Banana is an edible fruit which is rich in minerals and vitamins. Hence this report presents a comparative study of mineral
Contents in variety of bananas cultivated in coastal belt of Karnataka, India. Calcium (47.19 mg per 100g fresh weight), sodium (6.02 mg per 100g fresh weight) are found to be the most abundant in Galhi variety of banana and potassium (397.01 mg per 100g fresh weight) is found rich in Cavendish variety of banana. These minerals are indispensable for the development of human brain.

**Statement of the problem**

Today’s generation is very much in need of Brain & Mind power to compete in this World. To improve the power of Brain students are learning lot of things, undergoing activities which provoke their thinking abilities. The physical part of the body i.e. brain is taken care to an utmost extent leaving the Psychic part i.e. mind which operates and has a greater impact on the whole system of body.

Mental health disorders are the most important challenge to the mankind in the present World as it is also true to India. Research shows that response time of students has reduced due to the scientific advancement and modern facilities in television, computer, telephones etc. Lot of mental problems like pressure, stress, depression, anxiety, anger occupies human’s day to day life. Especially adults suffer physically and mentally to a greater extent.

Economic development of a country depends upon the economics of human health. Human health is determined by both physical and mental health. Physical health is being taken care in a greater extent, whereas mental health is being neglected totally. This ends up in a pathetic condition of our country having child abuse, rape, murders, thefts, suicides etc in a larger scale. Healthy relationship between Mind and Brain will definitely have an extraordinary output and also will improve the economy of our country in a greater extent.

**Mind and brain relationship**

Generally brain is considered as Mind. Actually it is not so. Brain is physical object and Mind is psychic object. Mind is what makes us human. Brain is one of the parts of human body. We can see the brain with our eyes, we can take photographs of brain and the same can be operated to rectify the diseases. Whereas Mind cannot be seen directly, we cannot take photographs and the same cannot be operated for its defects. We can keep our body in a relaxed condition without any movements. But at the same time Mind cannot be kept in a relaxed position, it will be always wandering, will be moving from one object to another continuously. Hence Brain and Mind are different entities and Brain acts as a utensil to hold the Mind until the end of human lifetime and Brain is a guesthouse to accommodate Mind for a specific period of time.

Brain is a nonphysical continuum which does not have a form, functions to understand and perceive the objects. In general our Mind is conveyed by our brain like a light is conveyed by a glass. The Brain acts like a CPU – Central Processing Unit of the body. It translates the contents such as feelings, thoughts, believes, memories, imaginations, emotions, attitudes etc; of Mind into complex patterns of nerve cell firing and chemical release. Mind is the complete set of activities being performed in the body with the help of Brain. Hence healthy Brain leads to healthy Mind. Unhealthy Mind leads to physical as well as mental sufferings. All our sufferings are not because of other aspects; it is purely of our own state of Mind. Purifying of Mind leads to healthy Mind in turn results in liberation from sufferings and gaining happiness and peace forever.

**Mental illness**

Mental illness is a disease where a person finds difficult to cope with demands & routines of daily life and also having thought & behavior disturbance. Difficulty in facing daily problems, inability to cope with demanding activities, confused thinking, high & low feelings, delusions, hallucinations, suicidal thoughts, social withdrawal are mostly faced by the adults with mental illness. Depression, stress, fear, anxiety, worries, changes in sleeping & eating habits and physical ailments are common mental problems faced by both adults & children to a greater extent.

In addition to the general mental problems children are facing additional mental illnesses like poor performance in education, poor grades in spite of hard work, aggressive behaviors, lack of obedience, nightmares, poor pattern recognition, poor response time, lack of alertness and hyper activity which are challenging demands to be taken care to establish an healthy economy.

Mental illness is said to be the main reason for the current problems that India is facing nowadays like
suicides, child abuse, murders, thefts, fights and wars. NIMHANS (The National Institute of Mental Health And Nero Sciences) reveals that 13.7 percent of India’s general population has various mental disorders due to experiencing stress, life style complexities, economic instability and poor dietary habits.

Nutrients for Mental health

Nutrients are a substance that provides nourishment required for growth, repair and proper functioning of human body. There are 13 essential vitamins: vitamins A, C, D, E, K, and 8 B vitamins. Vitamins play many important roles in our body, such as maintaining skin, acting as antioxidants to protect our cells from damage, and contributing to healthy reproduction & growth, strong bones and normal blood clotting.

There are 16 essential minerals - calcium, phosphorus, potassium, sulfur, sodium, chloride, magnesium, iron, zinc, copper, manganese, iodine, and selenium, molybdenum, chromium, and fluoride, play important roles in maintaining blood pressure, fluid & electrolyte balance, and bone health; making new cells; delivering oxygen to cells; and contributing to normal muscle and nerve functioning.

The following nutrients protect the Brain from ageing and preserves the cognitive functions and keep the mental health intact.

- Omega-3 fatty acids –
- B-Complex Vitamins – Vitamin B1,B2,B3,B5,B6,B7,B9,B12
- Vitamin C
- Vitamin D
- Vitamin E
- Minerals - Calcium, Magnesium and Zinc
- Amino acids
- Microbiotics
- Proteins & Choline
- Carbohydrates
- Fibre
- Iron

Mango - perennial crop for mental health

Perennial crops means that the crops which are alive throughout the year and harvested multiple times before the death. Mango is the national fruit of India and also it holds the title of “King of fruits”. India is the World’s major producer of Mango. India’s share is around 50 to 52% of world’s mango production. India produces 1000 varieties of mango. Since it is originated between 4000 and 5000 years ago, it has become part of all religious ceremonies, wedding celebrations and community festivals. The leaves of the mango tree are being used to decorate during festivals. In Indian mythology, many stories mentioned the mango tree. Mango is one of the fruit which is cultivated mostly in tropical areas. Mango’s nativity is South and Southeast Asia.

Mango for Mental health

Mango is one of the richest brain foods and which improves the mental health by enhancing the brain neurotransmitters through vitamin B6. It supports in achieving healthy mood and sleep patterns, develops immunity power, protects brain from aging and protects from constipation problems. Mental health improvement can be done by improving the gut. Gut is being considered as the second Brain. Mango helps in boosting the power of gut.

Nutrients available in Mango are:

- Vitamin A - Antioxidant needed for immunity
- Vitamin B6 - Needed for growth and maintenance
- Vitamin B9 – Folate or Folic acid - Important in genetic, metabolic and nervous system health
- Vitamin C - Antioxidant needed for immunity
- Vitamin E - Antioxidant that protect against Alzheimer’s disease (progressive mental deterioration).
Cont...

- Vitamin K - Helps in bone formation and bone repair.
- Calcium - Essential for strong bones.
- Iron - Essential to blood cell production, growth, immune health and energy.
- Magnesium - Balances calcium, improves cardiovascular and bone health.
- Copper - Helps to build blood cells, bone and collagen.
- Proteins - It is major source of energy, helps in body building, repair & maintenance, produces some hormones & enzymes, develops immunity and transports oxygen.
- Carbohydrates - Provides energy and helps for digestion.
- Fibre - Keeps the digestive system healthy.

Usage of Mango tree

Nowadays most of the people are suffering from diabetic due to life style and emotional disorders. This is not only common among the adults but also the children. Medical expenditure has become the major item in the monthly budget. This is again results in mental tension, whereas in the conventional treatment this is not at all expensive if we take the decoction of mango leaves over a period of 48 days for reducing sugar level. Hugging Mango tree for 20 minutes also will reduce blood pressure and sugar level in the blood. Taking rest under Mango tree also will help the people normalize the BP and blood sugar. Therefore planting one or two Mango trees or a Mango orchard and consumption of mango fruits will improve the individuals financially, physically and mentally.

Banana

Banana is a perennial plant that replaces itself. Bananas do not grow from a seed but grows from underground stems called rhizomes. Banana is the only plant in which all the parts of it are used fully. Banana is one of the oldest fruits known to mankind and also being consumed widely all over the world. India is the topper in Banana production in the World. It ranks fourth among the World’s food crops.

Bananas are naturally free of fat, sodium and cholesterol. Bananas are high in potassium, which helps the brain to transmit messages. Banana is the most perfect Brain food. It supplies nutrients essential for proper neurological functions. It also helps the Brain to regulate moods & appetite and also supports cognitive functions like focus & memory. It produces chemicals which promote good mental health.

Nutrients available in Banana are

- Vitamin B6 - Prevents from neurological disorders. Helps to grow new cells
- Vitamin B9 – Folate or Folic acid - Important in genetic, metabolic and nervous system health
- Vitamin C - Boosts immune system & cell health. Improves the absorption of other nutrients
- Magnesium - Promotes proper electrical activity between nerve cells in the brain.
Manganese - Necessary for bone health and metabolism.

Potassium - Provides good nerve & muscle function. Maintains balance of fluid in the body.

Proteins - It is major source of energy, helps in body building, repair & maintenance, produces some hormones & enzymes, develops immunity and transports oxygen.

Carbohydrates - provides energy and helps for digestion.

Fibre - Keeps the digestive system healthy.

Dopamine, Serotonin - Neuro transmitters enhances brain function and helps to keep the mood stable & bright.

Conclusion

Our ancestors had healthy food and systematic lifestyle which in turn resulted in healthy brain and mind with peaceful life pattern. But present diet and lifestyle in this modern era differs significantly. Busy lifestyle paved a path for the processed food which affects the generation in all aspects. The healthy genetic and environment handed over by our ancestors, may not be the same quality when we leave it to our future generation. Hence whatever we eat today not only affects our own health but also have impacts in our next generation. This can be counteracted by taking the help of Agriculture in getting healthy food to empower the Mind which can improve the Economy of India by improving the minds. Mental health improvement can be done by improving the gut. Gut is being considered as the second Brain. Mango helps in boosting the power of gut. Bananas are naturally free of fat, sodium and cholesterol. Bananas are high in potassium, which helps the brain to transmit messages. At this juncture, it is pertinent to contemplate that farmers should go for perennial crops like mango and banana cultivation as they are indispensable for human development, physically and mentally, which in turn accelerates the economic growth at a rapid rate.

Discussion

As the quality and the purity of the food determine healthy life, people are sensitive now-a-days as well as smart to differentiate the organic and in organic crops. The advanced technologies especially, genetically modified technology in agriculture makes hue and cry among the people. Therefore, the traditional cultivation of perennial crops and its impact on human development may be a solace to the present generation.

Ethical Clearance: VELS Research Committee

Source of Funding : Self

Conflict of Interest : Nil

References

Effect of Conventional Therapy and Postioning with Isometric Shoulder Exercises on Functional Shoulder Subluxation in Post Stroke Survivors

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Abstract

Objective: To determine the effects of conventional therapy with positioning and shoulder isometric exercises on functional shoulder subluxation in post stroke survivors.

Method: A total of 40 subjects were screened as per inclusion and exclusion criteria and they were briefed about the study and interventions. Informed consent was taken from the subjects initially through the neurological assessment of each subject taken as per data collection sheet. Subjects were selected by simple random sampling, lottery method & were allocated alternatively to group A and group B, who had post stroke shoulder subluxation. The amount of pain and subluxation was noted by Shoulder pain and Disability index and Sulcus sign. Subjects were selected according to the  Brunnstorm stages of recovery with stage 2 and above.

Conclusion: The use of shoulder isometric exercises along with positioning helps in normalizing tone, reducing spasticity and to decrease the chances of reoccurrence of subluxation in upper extremity in subjects with hemiparesis. In addition, results supported that these shoulder isometric exercises given along with conventional treatment and positioning was more effective than conventional treatment alone for elbow flexors, forearm pronators, wrist flexors specifically and slightly effective for shoulder abductors & shoulder external rotators.

Keywords: isometric exercises, subluxation, tone, spasticity, sulcus sign, brunnstorm stages, stroke.

Introduction

Stroke is a disease that occurs when the blood supply to the brain is stopped or when a brain haemorrhage occurs, causing body motor disorders and a sudden disturbance of consciousness¹. Ischemic stroke is the most common type, affecting about 80 percent of individuals with stroke, and results when a clot blocks or impairs blood flow, depriving the brain of essential oxygen and nutrients. Hemorrhagic stroke occurs when blood vessels rupture, causing leakage of blood in or around the brain. The term cerebrovascular accident (CVA) is used interchangeably with stroke to refer to the vascular conditions of the brain. Clinically, a variety of focal deficits are possible, including changes in the level of consciousness and impairments of sensory, motor, cognitive, perceptual, and language functions. To be classified as stroke, neurological deficits must persist for at least 24 hours. Motor deficits are characterized by paralysis (hemiplegia) or weakness (hemiparesis), typically on the side of the body opposite the side of the lesion.

The location and extent of brain injury, the amount of collateral blood flow, and early acute care management determine the severity of neurological
deficits in an individual patient. Impairments may resolve spontaneously as brain swelling subsides (reversible ischemic neurological deficit), generally within 3 weeks. Residual neurological impairments are those that persist longer than 3 weeks and may lead to permanent disability. Strokes are classified by etiological categories (thrombosis, embolus, or haemorrhage), specific vascular territory (anterior cerebral artery syndrome, middle cerebral artery syndrome, and so forth), and management categories (transient ischemic attack, minor stroke, major stroke, deteriorating stroke, young stroke)².

Early warning signs of stroke are sudden numbness or weakness of the face, arm, or leg especially on one side of the body. Sudden confusion, trouble speaking or understanding. Sudden trouble seeing in one or both eyes. Sudden trouble walking, dizziness, loss of balance or coordination. Sudden severe headaches with no known cause.

Other important but less common stroke symptoms are sudden nausea, fever, and vomiting distinguished from a viral illness by the speed of onset (minutes or hours versus several days). Brief loss of consciousness or a period of decreased consciousness (fainting, confusion, or coma).

Glenohumeral subluxation- The shoulder complex consists of four separate joints, which afford it incredible mobility in all the plane of motion, but at the expense of its stability. The glenohumeral joint (GH) relies on the integrity of muscular and capsuloligamentous structures rather than bony conformation for its stability. Injury or paralysis of muscles around the shoulder complex may lead to GH subluxation. Glenohumeral subluxation (GHS), a frequent complication for patients with poststroke.² The vulnerability of the glenohumeral joint to subluxation is a function of the anatomy of the joint. As an extremely mobile joint, it sacrifices stability for mobility.⁵

Method

Study design: Comparative study.

Participants: A total of 40 subjects, both male and female with post stroke shoulder subluxation were taken in the study. Patients with middle cerebral artery involvement, stage 2 and above Brunnstrom stages of recovery along with subluxated shoulder were included in the study whereas subjects with acute stroke, subjects with transient ischemic attack, associated psychological disorder, perceptual disorders, significant visual and auditory impairment or any orthopaedic disorders were not included in the study. Written informed consent was taken from the subjects those willing to participate. The subjects were randomly allocated by simple random sampling, lottery method & were allocated alternatively to group A and group B, who had post stroke shoulder subluxation. The amount of pain and subluxation was noted by Shoulder pain and Disability index and Sulcus sign. The outcome assessment was done post treatment.

Interventions:

Two groups were formed Group A (study group) where subjects were treated with shoulder isometrics exercises with positioning along with conventional treatment and Group B (control group) where subjects were treated only with conventional treatment.

All the subjects were treated once a day, 5 times a week.

Control group subjects were treated with conventional exercises only. This includes sensory re-education like stroking with different textured fabrics, pressing objects into the hand (coin, button, key), or drawing shapes/letters/numbers on the skin, icing, brushing or vibrating, soft tissue/joint mobilization and range of motion exercises (passive or active assisted exercises), positioning, splinting, stretching, electrical stimulation, reaching activities, functional mobility exercises, locomotor training and balance training.²⁻⁶⁻⁷⁻⁸⁻¹⁴

Study group was treated with all the exercises given for the control group in addition to the isometric shoulder exercises.

Each patient in the study group repeated the exercise 10 times. The exercises were performed with assistance once a day, five times per week for six weeks. The bedside isometric shoulder exercises include shoulder forward flexion, horizontal shoulder abduction, horizontal shoulder adduction, shoulder internal and external rotation along with shoulder shrug in a seated position.

Outcome measures:

Brunnstrom Stages of Recovery: The purpose of the Brunnstrom Stages of Recovery is to evaluate motor
recovery of stroke subjects. The Spearman correlation coefficients of inter-rater reliability ranged from 0.9276 to 0.9458, those for intrarater reliability from 0.8020 to 0.9798. The Spearman correlation coefficients for concurrent validity had a value of 0.620.  

Shoulder pain and disability index: The purpose of Shoulder pain and disability index is to evaluate current shoulder pain and disability. The reliability coefficients of ICC≥0.89 in a variety of patients populations. The SPADI demonstrated good construct validity, correlating well with other region-specific shoulder questionnaires.  

Modified Ashworth Scale: The purpose of the Modified Ashworth Scale is to measure spasticity in subjects who have lesions of the CNS or neurological disorders. The Modified Ashworth Scale is a quick and easy measure that can assist a clinician’s assessment of spasticity during passive soft-tissue stretching. Excellent to Adequate Test-Retest Reliability (Gregson et al 1999). Intra reliability adequate with ranges of 57.7% to 85% (Blackburn et al, 2002). Inter reliability with ranges of 42.5%-50% (Blackburn et al,2002)  

Result  

Table no. 1 Comparison of pre & post values of SPADI within Group A according to Friedman Statistics.  

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Rank Sum Difference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre v/s Post (2 week)</td>
<td>18.500</td>
<td>ns</td>
</tr>
<tr>
<td>Pre v/s Post(4week)</td>
<td>38.500</td>
<td>***</td>
</tr>
<tr>
<td>Pre v/s Post(6 week)</td>
<td>59.000</td>
<td>***</td>
</tr>
<tr>
<td>Post(2week) v/s Post(4week)</td>
<td>20.000</td>
<td>ns</td>
</tr>
<tr>
<td>Post(2 week) v/s Post(6 week)</td>
<td>40.500</td>
<td>***</td>
</tr>
</tbody>
</table>

Statistics: Statistical analysis was performed by using Instat-Graph pad. The average mean age of participants in Group A was 54.6 ± 4.041 and Group B was 54.4 ± 3.512, which showed there is no significant difference in age of subjects in both groups (t = 0.06575 & p = 0.8605) which was done by unpaired t-test.  

Discussion  

Stroke is a leading cause of serious long term disability in adults. More than 60% of stroke survivals suffer from persistent neurological deficit. Stroke patient incidence rate range from 0.2 to 2.5 per 1,000 populations per year in India. This illness costing millions in lost work as well as millions in medical state and insurance resources every year, represents a challenging area of management for physiotherapists.  

So the present clinical trial was conducted to find out the effect of conventional therapy and positioning with isometric shoulder exercises on functional shoulder subluxation in post stroke survivors.  

40 subjects clinically and radiologically diagnosed with stroke having hemiparesis and fulfilling inclusion and exclusion criteria with age above 40 years were included in the study. Further they were classified according to Brunnstorm stages of Recovery as stage 2 and above. They were allocated into two groups, Group A and Group B, each containing 20 subjects. A baseline treatment was given with an addition of isometric shoulder exercises in Group A and only baseline or conventional treatment in Group B. The outcome was measured by Modified Ashworth Scale and SPADI.  

Conventional treatment of sensory re-education, passive exercises, functional mobility training, gait training, balance training, supportive devices, stretching, electrical stimulation was common for both the groups.  

Statistical analysis was performed by using Instat-Graph pad. The average mean age of participants in Group A was 54.6 ± 4.041 and Group B was 54.4 ± 3.512, which showed there is no significant difference in age of subjects in both groups (t = 0.06575 & p = 0.8605) which was done by unpaired t-test. The total number of participants included over 40 Group A contained 10 males and 10 females and Group B had 13 males and 7 females. Out of 40 subjects 12 had left side affected and
8 had right side affected for group A and 11 had left side affected and 9 had right side affected.

Friedman Statistics test was used to analyse the effect of isometric shoulder exercises along with conventional therapy and positioning on spasticity within the groups which showed that there was significant reduction on spasticity (p<0.0001) post treatment. Mann-Whitney test was used to analyse the effect of isometric shoulder exercises along with conventional therapy and positioning on spasticity between the groups. There was no significant difference for shoulder abductors, shoulder external rotators, elbow flexors and forearm pronators post 2 weeks but there was quite significant, significant and extremely significant difference post 4 weeks and post 6 weeks, p value less than 0.05 and upto 0.08.

The results from the statistical analysis of the present study supported the alternative hypothesis which stated that there will be beneficial effect to the subjects treated with shoulder isometric exercises along with conventional therapy and positioning.

Hence above results showed that Group A subjects treated with shoulder isometric exercises along with conventional therapy and positioning showed better reduction in spasticity.

Thus it can be stated from above study that physical therapy interventions like isometric shoulder exercises are more efficacious and cost effective.

**Conclusion**

The use of shoulder isometric exercises along with positioning helps in normalizing tone, reducing spasticity and to decrease the chances of reoccurrence of subluxation in upper extremity in subjects with hemiparesis. In addition, results supported that these shoulder isometric exercises given along with conventional treatment and positioning was more effective than conventional treatment alone for elbow flexors, forearm pronators, wrist flexors specifically and slightly effective for shoulder abductors & shoulder external rotators.

**Conflict of Interest:** There were no conflicts of interest in this study.

**Funding:** This study was funded by Krishna Institute of Medical sciences Deemed To Be University, Karad.

**Ethical Clearance:** The study was approved by the institutional ethics committee of KIMS DU. The trial was registered with Clinical Registry of India with no: CTRI/2018/01/011545.

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Knowledge and Self-Reported Practice Regarding Mobility Safety Measures of Patients among Employees

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Abstract

Background of the Study: The falls suffered by the patients during their hospitalization are one of the most important occurrence in the breakdown of security and often responsible for an increased number of hospital days and worse recovery conditions. The aim of the study were to assess the knowledge regarding mobility safety measures of patients with spinal cord injury among patient mobility services (PMS) employees and identify the self reported practice of body mechanism of the employees.

Materials and Method: Quantitative approach with non experimental survey design was used. The study was conducted among 60 patient mobility service department employee in Amrita Institute of Medical Sciences, Kochi (AIMS) sampling technique used was convenience sampling. A knowledge questionnaire regarding mobility measures in spinal cord injury patients and a self-reported questionnaire was distributed to 60 patient mobility employee to identify the physical activity levels, personal characteristics, and associated work factors.

Result: The participants age were between 17-25 years, majority (51.7%) of them were males. Most of the employees 26.7% had poor knowledge, 55% had average knowledge and 18.3% had good knowledge.50% of the employee had good practice skill, 31.7% had excellent practice skill 10% had average skill and 8.3% had poor skill.31.7% employee did not have and 41(68.3%) employee had experience in shifting patients’ with spinal cord injury. There was significant association between area of work and safety mobility measures using \( \chi^2 = 0.045, (p=0.05) \) and there was also highly significant association between previous exposure of information and body mechanics \( \chi^2 = 0.001(p=0.001) \).

Conclusion: Overall results provide relevant feedback of the knowledge and the self-reported practice of the employee which throws light on the importance of reducing and possibly minimizing threats as well as extend safe patient handling.

Keywords: Mobility safety measures, body mechanics, employees.

Introduction

Most of the general public acknowledges the paralysis associated with a spinal cord injury¹. Proper techniques in handling and transferring of the spinal cord injured patient immediately after the trauma may prevent further neurological damage and resulting complications. As management of Spinal Cord Injury (SCI) should begin at the site of the injury, awareness of proper techniques of acute management would avoid the complications in injured patients ². The physical and technical difficulties involved in the work of staff often lead to the occurrence of problems, the reasons for which are not easy to identify and clarify³.

Hospital falls are common and may lead to negative outcomes such as injuries, prolonged hospitalization
and legal liability. Falls or accidents are responsible for considerable morbidity, immobility, and mortality among, mainly in older peoples. In health care facilities, patient accidents have been a major contributing factor associated with patient injuries that result in increased length of the hospital stay and costs. Falls that occur in hospitalized patients are a wide spread and serious threat to patient safety. The falls suffered by the patients during their hospitalization are one of the most important occurrence in the breakdown of security and often responsible for an increased number of hospital days and worse recovery conditions. According to IGAS a Portugal study conducted based on hospital accidents (2007) globally 4,200 accidents are registered related to patient falls from stretchers, beds, armchairs or wheelchairs. In this study, it was ascertained that, 85 of these cases patient ended with dying. Developing practices to reduce or minimize this necessary risk represents a potentially important area of patient safety research. This study focuses on transportation of critically ill patients by health professionals (paramedics, nurses, physicians and/or respiratory therapists) between hospitals (to receive higher levels of care) and within the hospital (for diagnostic or therapeutic procedures). Maintaining the body mechanics of hospital employees during shifting, turning of patients reduces the incidence of back injury among hospital employees and provides awareness about self-injury prevention among them.

Nanna S. Hellesø, Bente Nordtug, Hildfrid V. Brataas (2016) conducted a qualitative study on Patient transfer skills and safety culture using content analysis approach. Data were answers to open questions about patient transfer practice and the meaning of a multi-component intervention carried out in one Norwegian municipality. Research focus were on patient transfer skills, safety culture, and psychosocial climate at the workplace. Purposive sampling included sixty-one health care personnel. All had been participating in the intervention. The analysis revealed the theme “Competence, practice and health impact” with sub themes “Measures facilitates change” and “Influence over time”. The intervention seemed to promote a safety climate with positive impact on employees’ health. Further, the transfer movements were more comfortable and safe for the patients and they became more self-reliant. Comprehensive, educational, and technical measures facilitated for change. After intervention termination, the intervention had persistent influence over time on daily ergonomic patient transfer practices.

Katarina Kjellberg, Monica Lagerström, Mats Hagberg, (2003) conducted a study on 102 nurses in orthopedic ward on Work technique of nurses in patient transfer tasks and associations with personal factors. Back disorders among nursing personnel are associated with the worktask of assisting patients during transfers. The objectives of the study were to explore the work technique applied by nursing personnel in patient transfer tasks and determine whether different personal factors were associated with work technique safety. A work technique score was calculated for each performed transfer. It indicated the level of musculoskeletal safety and hazard for the nurse. The results indicated an association between poor work techniques and low-back symptoms.

Patricia Finch Guthrie, Linda Westphal, Bruce Dahlman, Mark Berg, Kathy Behnam and Deborah Ferrell conducted an evidence-based on the work-related injuries of nurses. A patient lifting intervention for preventing process to implementation of effective lifting intervention, in the orthopedic and neurology units in a Minnesota hospital. The injuries for the two units decreased from 21 to 9 injuries, while the salary and work replacement costs were $48,220 and $2,560 in 2001 and 2002 respectively. The lift team averaged 80 lifts per day and 95% of the nursing staff attended the back school.

Nevertheless, there are very few literature regarding knowledge, health and working conditions among the patient mobility service employees conducted in India. Here this study designs with the aim of investigation, in the above mentioned area.

Materials and Method

The study participants in this study were sixty patient mobility service employees who have a pivotal role in transferring or shifting of the patient having different type of disabilities for minimum of one year work service atAIMS, Kochi. Subjects were selected using non probability convenient sampling technique. Non experimental survey design was used in this study. The setting was selected because of the easy accessibility of the group, familiarity with setting, convenience in terms of adequate sample and the cooperation offered by the management. The researcher explained the purpose of the study and obtained an informed consent from each
subject. Knowledge questionnaire on mobility safety measures in transferring patients with spinal cord injury and Self-Assessment Body Mechanic Questionnaire were used to assess their awareness in handling, transferring & safety of patients’ with spinal cord injury respectively. Data analysis was done by using descriptive & inferential statistics.

Findings

Section I: Description of sociodemographic variables of the subjects

Table 1: Frequency and percentage distribution of subjects based on demographic characteristics.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Sample characteristics</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 – 20</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>21-25</td>
<td>36</td>
<td>60</td>
</tr>
<tr>
<td>2.</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>31</td>
<td>51.7</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>29</td>
<td>48.3</td>
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<tr>
<td>3.</td>
<td>Educational level</td>
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</tr>
<tr>
<td></td>
<td>High school level</td>
<td>40</td>
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<tr>
<td></td>
<td>Secondary level</td>
<td>18</td>
<td>30</td>
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<tr>
<td></td>
<td>Degree</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>4.</td>
<td>Use of Transferring devices for mobility</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wheel chair</td>
<td>45</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Stretcher</td>
<td>15</td>
<td>25</td>
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<tr>
<td>5.</td>
<td>Area of work</td>
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<td></td>
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<tr>
<td></td>
<td>OPD</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>ICU/OT</td>
<td>37</td>
<td>61.7</td>
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<tr>
<td></td>
<td>Ward</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>6.</td>
<td>Experience in shifting spinal cord injury patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>41</td>
<td>68.3</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>19</td>
<td>31.7</td>
</tr>
<tr>
<td>7.</td>
<td>Exposure of information</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Health personnel</td>
<td>42</td>
<td>70</td>
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<tr>
<td></td>
<td>Internet</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Observation of handling patient</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>No exposure</td>
<td>14</td>
<td>23.3</td>
</tr>
</tbody>
</table>
The data presented in table 1 enumerates that the subjects were of the age group between 15 – 25 years, 40 % subjects were of the age group between 17 – 20 years, and 60 % were of the age group between 21 – 25 years, 29 (48.3%) subjects were females and 31 (51.7%) subjects were males, the educational level of subjects having degree were 2 (3.3%) , high school education were 18 (30%) and secondary education were 40 (66.7%). Utility of transferring devices 15 (25%) subjects mainly used stretchers for mobility of patients', and 45 (75%) subjects used wheel chair for the mobility of patients'. Experience in shifting spinal cord injury patients’ 19 (31.7%) subjects did not have and 41 (68.3%) subjects had experience, 42 (70%) subjects received exposure of information regarding transfer of spinal injury patients’ from health personnel 2 (3.3%) subjects got through internet ,2 (3.3%) subjects gained through observation of handling patient 14 (23.3%) subjects had no exposure.

Section II: Description of level of knowledge level of subjects on safety mobility measures

The data illustrated in Figure 1 shows that among 60 subjects, 12 (20%) subjects had >2 years of experience in patient mobility service 8 (13.3%) subjects had 2 years, and 14 (23.3%) subjects had 1 year, 26 (43.3%) subjects were newly joined in AIMS, Kochi.

Section III: Description of Self-reported practice of PMS employee's body mechanics

The data presented in table 2 enumerates the self-reported practice of subject’s body mechanism in shifting of spinal cord injury patients’. The practice was graded as poor, average, good, excellent. Majority of the subjects 30 (50%) had good practice skill, 19 (31.7%) subjects had excellent practice skill, 6 (10%) subjects had average skill and 5 (8.3%) subjects had poor skill.

Section IV:- Association between PMS employee’s knowledge on mobility safety measures and selected demographic variables
Table 3: Association between knowledge on mobility safety measures and selected demographic variables

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Knowledge</th>
<th>df</th>
<th>( \chi^2 ) value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Average</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>----------------------</td>
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<td>---------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>1. Area of work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPD</td>
<td>6</td>
<td>50</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>ICU/OT</td>
<td>10</td>
<td>27</td>
<td>20</td>
<td>54.1</td>
</tr>
<tr>
<td>Ward</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>63.6</td>
</tr>
<tr>
<td>2. Exposure of Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health personnel</td>
<td>15</td>
<td>35.7</td>
<td>22</td>
<td>52.4</td>
</tr>
<tr>
<td>Internet</td>
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<td>0</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>No exposure</td>
<td>1</td>
<td>7.1</td>
<td>9</td>
<td>64.3</td>
</tr>
<tr>
<td>Observation of handling patient</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* significant (P<0.05)

Data presented in table 3 shows that, there was significant association between knowledge on mobility safety measures and area of work, \( \chi^2 \)-square, 0.045, which is statistically significant (p=0.05) and there was also significant association between previous exposure of information and knowledge on mobility safety measures, 0.015, which is statistically significant (P=0.05).

Section V: Association between self reported PMS employee’s practice and selected demographic variables

Table 4: Association between self reported practice of body mehacism and selected demographic variables

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Practice of body mehacism</th>
<th>df</th>
<th>( \chi^2 ) value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>f</td>
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<td>f</td>
<td>%</td>
<td>f</td>
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<tr>
<td>----------------------</td>
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</tr>
<tr>
<td>1 Exposure of Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health personnel</td>
<td>2</td>
<td>4.8</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>Internet</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No exposure</td>
<td>1</td>
<td>7.1</td>
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<td>14.3</td>
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<tr>
<td>Observation of handling patient</td>
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<td>0</td>
</tr>
<tr>
<td>9</td>
<td>28.02</td>
<td>0.001**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Highly significant (P<0.001)

Data presented in table 4 shows that, there was a highly significant association between previous exposure of information and body mechanics at, (P=0.001).
Discussion

The present study findings implicates that 33(55%) employee have average knowledge of patient mobility measures followed by 16(26.7%) having poor knowledge and 11(18.3%) employee having good knowledge of patient mobility measures.

A descriptive study conducted by RMIM Weerasekara, BMHSK Banneheka, T Sivananthawerl and Fahim Mohamed, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka regarding awareness among school athlete about handling and transferring techniques of a suspected spinal cord injured athlete, The findings shows that when considering about the proportions of the scores (awareness), majority of the students (43.6%) scored 41-60. The percentage of students who have scored 20-41 was almost similar to that of students scored 61-80 (26.7% and 23.4% respectively). In contrast, only a few students (0.4%) scored over 80. It was also found that, 94.7% (n=230) of the participants were willing to update and improve their knowledge regarding the correct techniques in handling and transferring of a suspected spinal cord injured person ².

The supportive study findings and the present study findings indicates the necessity of imparting knowledge regarding transferring and shifting suspected spinal cord injury target group is vital to prevent further complications.

Conclusion

This study found that use of the body mechanics principle can reduce clinical-practice fatigue and increase employee practice satisfaction. Various training programs that can increase use of the body mechanics principle among patient mobility employees’ need to be developed so that they can contribute to the formation of proper habits for physical activities for the safe nursing of patients.

Conflicts of Interest: Nil

Source of Funding: Self

Ethical Clearance: Research proposal was presented before the research committee of Amrita College of nursing and obtained approval. Later ethical clearance obtained from the ethical committee of AIMS, Kochi.

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Oxidative Stress and Role of Glutathione S-transferase in Brain Health and Ageing

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ABSTRACT

Oxidative stress arises because the antioxidant defense system of the human body is not entirely efficient. The major enzymes belong to this category are superoxide dismutase, catalase, glutathione peroxidase and glutathione reductase. GSTs are the major determinants of the intracellular concentration of 4HNE and account for the metabolism of the majority of cellular 4HNE through its conjugation to GSH. Therefore, GSTs and the transporter(s) catalyzing the efflux of GS-HNE are likely to play a major role in regulating 4HNE homeostasis in cells. Consequently, these proteins should be relevant to the mechanisms that regulate 4HNE-mediated signaling for apoptosis, differentiation, proliferation and thus affecting ageing. This mechanism can be exploited to manufacture appropriate drugs to decelerate the ageing process by 4HNE regulation.

Keywords: Glutathione s-transferase (GST), Oxidative stress, Ageing, Reactive Oxygen Species (ROS), 4-hydroxy-2-transnonenal (4HNE)

Introduction

In aerobes oxygen is essential for the maintenance of vital functions of the cells. During respiration 80-95% of the total oxygen consumed by the body is reduced to water by electron transport chain of mitochondria. However, 3-5% of oxygen consumed by mitochondria is leaked. This leakage of oxygen from electron transport chain leads to formation of superoxide (O$_2^-$) radical by reduction of an electron from the ground state of oxygen molecule[1]. However, during various metabolic activities the other sites of oxygen radical production are microsomes[2], peroxisomes[3] and cytosol[4], which was latter extended by McCord and Fridovich[5] into “superoxide theory of oxygen toxicity” reveals that superoxide formation is one of the major factors in oxygen toxicity.

Addition of one or more electrons to O$_2^-$ forms peroxide ion (O$_2^{-2}$). Hydrogen peroxide reacts with iron it forms hydroxyl radical[6]. Hydroxyl radical is one of the potent oxidants, which affects every type of organic cellular macromolecules instantaneously, and results in lipid peroxidation (LPx), protein degradation enzyme inactivation, DNA damage and ultimately cell death. However, the partial reduction of oxygen forms reactive chemical intermediates. These intermediates are known as reactive oxygen species (ROS) or free radicals.

The most important free radicals in biological systems are radical derivatives of oxygen. Oxygen is required to transfer various substances for the release of the energy and detoxify xenobiotics. During this process oxygen acts as terminal electron acceptor and is eventually converted to more stable compound, water. This reduction of one O$_2$ via the cytochrome oxidase system of respiratory chain requires 4 electrons. Such type of reduction is known as transvalent reduction of oxygen to water[7].

Sources of ROS in biological system are cellular metabolic processes such as mitochondrial electron transport, endoplasmic reticulum oxidation, Enzymatic activity etc and environmental factors such as drugs,
pesticides, tobacco smoke, alcohol, radiations, high temperature etc. ROS have important roles in regulation of gene transcription in higher eukaryotes, development and differentiation, mitochondrial oxidation, oxygen transportation by haemoglobin, cytochrome P 450 activity. They cause oxidation and peroxidation of proteins, lipids, and DNA, which can lead to significant cellular damage and even tissue or organ failure (ROS-mediated diseases). Knight in his review has related various diseases/ disorders to ROS. (Aging, Atherosclerosis, Brain disorders, cancer, cardiac myopathy, Chronic granulomatous disease, Diabetes mellitus, Eye disorders, inflammatory disorders, Iron overload, Lung disorders, Nutritional deficiency, Radiation injury, Rheumatoid arthritis, Skin disorders).

Betteridge reported that, the free radicals can be produced by several different biochemical processes within the body. Shivakumar et al. recorded that in rats, the levels of thiobarbituric acid reactive products, indicative of lipid peroxidation, were very low at birth and increased to adult levels by the 16th day after birth. Moreover, the free radicals and lipid peroxidation have been reported to be increased in the aged breain of rats. Also, the lipid peroxidation showed an elevated increase with the aging: this fact is more evident in neuronal than in glial cells of rats. The increased levels of thiobarbituric acid-reactive substances (TBARS) suggest a net increase in the levels of oxygen free radicals which could be due to their increased production and/or decreased destruction.

Role of Oxidative stress on Health and Brain Ageing: Since oxidative stress arises because the antioxidant defense system of the human body is not entirely efficient and increased free radical production is likely to lead to damage. In response to mild oxidative stress the body can increase its antioxidant defense levels. Unfortunately, severe oxidative stress caused by toxins capable of making free radicals or depleting antioxidant defenses can lead to cell injury and death. There is increasing evidence that free-radical-induced oxidative stress contribute to diseases such as neurodegenerative disease, chronic inflammatory disease, cancer and cardiovascular disease. Alzheimer’s disease is a neurodegenerative disease associated with the ageing brain.

Oxidative Defense System: Production of oxyradicals or reactive oxygen species by cells is inevitable therefore cellular system has developed efficient defenses to neutralize the oxyradicals in course of evolution. The antioxidant defenses are highly conserved in nature. There are two major types of antioxidant defenses seen in organisms. The first type comprises of a cascade of enzymes known as antioxidant enzymes. These enzymes act in concert. The major enzymes belonging to this category are superoxide dismutase, catalase, glutathione peroxidase and glutathione reductase. The other type constitutes of small antioxidant molecules such as ascorbic acid, tocopherol, ubiquinone, uric acid and beta carotenoids.

Reactive Oxygen Species: Aerobic organisms generate reactive oxygen species (ROS) such as superoxide anion radical (O2•−), hydrogen peroxide (H2O2) and hydroxyl radical (•OH) as a result of oxidative metabolism. •OH can initiate lipid peroxidation (LPO) in tissues. Among all the antioxidants glutathione s-tranferase is having a great role as an anti aging agent in the body by detoxification of the toxic materials.

GSTs: Determinants of Cellular Concentration of 4HNE: GSTs are the major determinants of the intracellular concentration of 4HNE and account for the metabolism of the majority of cellular 4HNE through its conjugation to GSH. Of the multiple cell constituents, 4HNE and other unsaturated aldehydes display the highest reactivity with thiols. 4HNE readily forms a Michael adduct with GSH, and the reaction is further accelerated by GSTs. The GSTA4-4 isoform is particularly effective conjugating 4HNE to GSH. This is generally considered a detoxification step, although glutathione-conjugates of α, β-unsaturated aldehydes have been shown to be toxic.

4HNE is formed primarily from the degradation of ω-6 polyunsaturated fatty acids such as arachidonic and linoleic acids. GSTs can regulate intracellular levels of 4HNE by attenuating its formation through their glutathione-peroxidase activity and also by conjugating it to GSH through their transferase activity. In mammalian tissues, a subgroup of alpha-class GST isozymes has high activity for conjugating 4HNE to GSH. Vatsayan et al. have shown that GSTA4 knock-out mice having impaired 4HNE metabolism and increased 4HNE levels in tissues are more sensitive to the toxicity of oxidant chemicals/oxidative stress suggesting the role of 4HNE in the mechanisms of toxicity of oxidant xenobiotics and a protective role of GSTA4-4 against oxidative stress.
Role of 4HNE in Aging: The accumulation of ROS without sufficient antioxidant defenses produces oxidative damage to all macromolecules. Oxidation of lipids, in particular, affects cell membranes and other lipid-containing structures and has important pathological implications due to the high reactivity of its products. Short-lived ROS convert polyunsaturated fatty acids, through a chain reaction via lipid hydroperoxides, into rather stable, but reactive and thus toxic α,β-unsaturated aldehydes, such as 4HNE, acrolein, and malondialdehyde (MDA).[30]. As electrophiles, such α,β-unsaturated aldehydes can form Michael adducts on nucleophilic centers of proteins (targeting lysine, cysteine and histidine) and can cause protein cross-linking.[31]. 4HNE is considered to be a signaling molecule that conveys the information that an oxidative event has occurred. The signal then coordinates an appropriate cellular response.

Discussion

Glutathione S-transferases (GSTs) regulate 4HNE concentrations and belong to a family of multifunctional enzymes whose roles in detoxification of electrophilic xenobiotics or electrophilic metabolites is well established[22,32-36]. In general, GSTs catalyze the conjugation of a wide variety of structurally dissimilar compounds containing electrophilic carbon, nitrogen, or sulfur atoms to GSH - the major endogenous low-molecular-weight nonprotein thiol synthesized de novo in mammalian cells[37-38]. Disruption of GSH metabolism has a major impact on cellular defenses and normal physiology, and evidence is emerging that GSTs are involved in the regulation of 4HNE-mediated signaling processes[23]. GSTs are the major determinants of the intracellular concentration of 4HNE and account for the metabolism of the majority of cellular 4HNE through its conjugation to GSH. Of the multiple cell constituents, 4HNE and other unsaturated aldehydes display the highest reactivity with thiols[17]. 4HNE readily forms a Michael adduct with GSH, and the reaction is further accelerated by GSTs. The GSTA4-4 isoform is particularly effective conjugating 4HNE to GSH[18-21]. This is generally considered a detoxification step, although glutathione-conjugates of α, β-unsaturated aldehydes have been shown to be toxic[22]. GST catalyze conjugation of lipid aldehydes; including 4HNE, with GSH and the reduction of those conjugates by AR are the major defense against oxidative stress-induced cytotoxicity[39-41]. GST-catalyzed GS-lipid aldehyde conjugation is the main mechanism of detoxification of endogenous lipid aldehydes, including 4HNE, as well as the metabolism of xenobiotics. GS-lipid aldehyde conjugates such as GS-HNE are readily reduced by AR to corresponding GS-lipid alcohols, such as GS-DHN[45]. Both GS-HNE and GS-DHN are actively transported out of the cells[42, 43-44].

Conclusions

Adduction of toxic aldehydes with GSH and their active transport out of the cells may be the major defenses against the oxidative stress-induced cytotoxicity, genotoxicity and a number of related diseases[45]. Thus GSTs are relevant to the regulating mechanisms for 4HNE-mediated apoptosis, differentiation and proliferation. This mechanism can be exploited to manufacture drugs to decelerate the ageing process. Research on antioxidants has gained much interest due to increased evidence of the importance of antioxidants in human health. This has brought about considerable research on defining and finding components with anti-oxidative activity in humans and in other biological systems[46].

Funding Statement: self

Conflict of Interest: The authors declare no conflict of interest.

Ethical Clearance: Taken from the Head of the Institution for publication.

REFERENCES


Methylation-Assisted Epigenetic Evolution and the Psycho-biology of Human Experiences

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ABSTRACT

DNA methylation-assisted epigenetic variation can provide an evolutionarily and ecologically important source of phenotypic variation among individuals. Through evolution by control over thoughts and emotions one can interpret the phenomenal experiences in a different light. Understanding of epigenetic mechanisms will provide insights into individual and population processes at both ecological and evolutionary time scales. Instead of biology controlling an individual’s evolution through genetic expression, the latter may very well be determined by the individual’s thoughts, actions and experiences. Epigenetics shows that the thoughts and the experiences control the biology. By changing the thoughts, one can influence and shape the genetic make-up and in turn can determine one’s evolution in accordance with the experiences generated.

Keywords: DNA methylation, Epigenetics, thoughts, Evolutionary force, genetic make-up.

Introduction

Evolutionary biology is currently experiencing an emergence of several research areas that transcend the boundaries of the Modern Synthesis, which was the last major conceptual integration in evolutionary biology[1]. The Modern Synthesis used the concepts of population genetics to integrate Mendelian genetics with evolution by natural selection[2]. The role of epigenetics in evolution and ecology is a more recent focus to have a concrete background.

The Darwinian theory of evolution contends that mutations come about by chance and amongst such mutations rarely, a few survive. This contention is slightly modified now[3]. The new thought that has emerged in this deliberation is that “the urge of life” has an innate tendency to generate more and more complex forms appropriate to the environmental changes[3]. This implies that the fundamental cause of adaptive evolution is the “urge”, which is lodged in the psychology of the individual.

Regarding “natural selection” Dobzhansky[4] opines that, “species are produced not because they are needed for some purpose” beyond themselves. Though not explained further by him, it implies that it is their mind and thought, or their purpose, leading to phenotypic manifestation, which in turn, gives rise to speciation. Thus conscious thought leads to evolution. In his view, nothing in biology makes sense except in the light of evolution.

According to Weismann Homo sapiens is an optimistic sobriquet; translated as “knowing man” it is merely descriptive of our species[5]. We are animals that specialize in thinking and knowing (cognition) and it is our extraordinary cognitive powers, which have enabled us to do remarkable things[5]. The “development of art of novel thinking” is an important stage in the evolution of human cognition[6].

However, the second kind of co-evolutionary process, “gene-culture co-evolution”, involves the interaction of genetic and non-genetic mechanisms that allow individuals to acquire adaptively relevant-information from others, not via the replication of DNA sequences, but through learning[7].

Molecular biology is the basis of Biogenesis. As a result of the discovery of genetic code and the basic molecules DNA, RNA in the living cell[8]. Scientists believe that consciousness is an epiphenomenon of complexity[3].

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The fast growing field of epigenetics seems to indicate that an individual is the product of its experiences in its life, which cause changes in the operation and functioning of the genes. Genes actually switch on or off depending on the in experiences. In other words, an individual is born with certain genes, but the experiences in its life determine which genes get expressed and which don’t. In this way, the environments in which an individual is placed to get the experiences are the determinants of the expressions of the genes.

**Epigenetics and Methylation:** Epigenetics has expanded to the study of heritable changes in gene expression and function without alterations in the DNA sequence and to the study of stably heritable phenotypes that occur without alterations in DNA sequence. Epigenetic mechanisms interact with genetic, physiological, and morphological systems and may be an important component of organism-environment interactions. Some epigenetic characters can be stably transmitted across generations. Thus, epigenetics has a mechanism of heredity that was not considered in the framework of the Modern Synthesis. Epigenetic mechanisms may play critical roles in phenotypic plasticity, soft inheritance, an individual’s response to environmental stressors, invasive species biology and conservation biology. Understanding epigenetics will likely to provide insights into individual and population processes at both ecological and evolutionary time scales.

Pigliucci has identified several major areas of innovation that transcend the Modern Synthesis: epigenetics, evolvability, phenotypic plasticity, evolution on adaptive landscapes, evolutionary developmental biology, and systems biology. Integrating these new ideas with the Modern Synthesis forms a new conceptual framework of evolution, which they termed the Extended Synthesis, as it will extend, rather than refute, the Modern Synthesis. This subject has been the focus of much recent work, and an excellent description is provided in the book: *Evolution—The Extended Synthesis*. The importance Epigenetics as one of the core areas of molecular biology in the Extended Synthesis.

Epigenetic variation in DNA methylation can provide an evolutionarily and ecologically important source of phenotypic variation among individuals. The violet (*Viola cazorlensis*) has a high level of inter-individual DNA methylation variation that differentiated populations from southeastern Spain and variation among individuals was related to 2 Genetics Research International the amount of damage caused by herbivory. The invasive Japanese knotweed (*Fallopia japonica* and *F. x. bohemica*) has significant differences in DNA methylation among populations from the northeastern United States, and a portion of the variation could be attributed to different habitats. Allopolyplod orchids (*Dactylorhiza majalis* s.str, *D. traunsteineri* s.l., and *D. ebudensis*) have variation in DNA methylation that was significantly related to environmental variables. Genetically identical dandelion (*Taraxacum officinale*) plants develop variation in DNA methylation in response to stressors, and many of these changes are stably inherited in the next generation. As a specific example, house sparrows (*Passer domesticus*) from North America and Africa introduced into Europe have a higher level of variation in DNA methylation compared with these birds in their native environments, which suggests that DNA methylation may compensate for the decreased genetic variation caused by introduction into a new environment.

**Gene activation by conscious thought:** Every minute of every day, the physical body is physically reacting, literally changing, in response to thoughts that run through our mind. The first requirement for sketching this new vision is to address the glaring omission of the biology of emotion which remains conspicuously missing from even our most enduring explanatory paradigms. In its usage here, the term “emotion” refers directly to the rich pallet of human emotional experiences, such common everyday feelings as happiness, sadness, courage, fear, gratitude, anger, admiration, envy, love and hate. Such feelings modulate thoughts and motivate actions; they often mediate social interactions, and play an enormous part in our everyday lives. When one exercises compassion and consciously practices gratitude, there is a surge of rewarding neurotransmitters, like dopamine, and one experiences a general alerting and brightening of the mind, correlated with more of the neurochemical norepinephrine.

What flows through the mind also sculpts the brain in permanent ways. We can think of the mind as the movement of information through the nervous system, which on a physical level is all the electrical signals running back and forth, most of which is happening below the conscious awareness. As a thought travels
through the brain, neurons fire together in distinctive ways based on the specific information being handled, and those patterns of neural activity actually change the neural structure. Busy regions of the brain start making new connections with each other, and the existing synapses connecting neurons which experience more activity get stronger and become more sensitive, and start building more receptors. New synapses are also formed in the process.\[25\]

One example of this is the well-known London cab driver studies which showed that the longer someone had been driving a taxi, the larger their hippocampus, a part of the brain involved in visual-spatial memory. Their brains literally expanded to accommodate the cognitive demands of navigating London’s tangle of streets. Research has also proven the numerous benefits of meditation for one’s brain and shown that meditation produces measurable results, from changes in grey matter volume to reduced activity in the “me” centers of the brain to enhanced connectivity between brain regions.\[25\]

There are thousands upon thousands of receptors on each cell in our body. Each receptor is specific to one peptide, or protein. When we have feelings of anger, sadness, guilt, excitement, happiness or nervousness, each such emotion releases its own flurry of neuropeptides. Those peptides surge through the body and connect with those receptors which change the structure of each cell as a whole. Where this gets interesting is when the cells actually divide. If a cell has been exposed to a certain peptide more than others, the new cell that is produced through its division will have more of the receptor that matches with that specific peptide. Likewise, the cell will also have less receptors for peptides that its mother/sister cell was not exposed to as often.

So, if one keeps bombarding the cells with peptides from negative thoughts, one is literally programming one’s cells to receive more of the same negative peptides in the future. What is even worse is that one is also simultaneously lessening the number of receptors of positive peptides on the cells, making oneself more inclined towards negativity.

The thoughts have a direct access to beneficial genetic activity which also affects how well the cells function, via the genetic activity inside the cells.

Every cell in the physical body is replaced in about every two months. One can thus reprogram one’s pessimistic cells to be more optimistic by acts of compassion. We are affecting our genes with every thought we have.

This means that one’s biology doesn’t really spell one’s destiny, and that one isn’t controlled by one’s genetic make-up. Instead, genetic activity can be determined by the thoughts, attitudes, and experiences. Epigenetics shows that thoughts and experiences control the biology. By changing the thoughts, one can influence and shape one’s genetic make-up. One has a choice in determining what input the genes receive. The more positive the input, the more positive is the output of the genes.

Leading edge, evidence-based theories about the new forms of cognition that emerged in the course of human evolution come from a range of disciplines, including anthropology, archaeology, economics, evolutionary biology, neuroscience, philosophy, psychology and quantum physics. The new forms of cognition involve causal reasoning, imitation, language, metacognition and theory of mind.\[5\]

**Thoughts for conscious evolution:** Recent Epigenetics researches on the regulation of gene expression in the central nervous system (CNS) during stress mainly focus on three mechanisms: DNA methylation, histone modifications and microRNA activity, which can be responsible for dynamic molecular adaptations of the CNS to stressors. The primary circuit that initiates, regulates and terminates a stress response is the limbic–hypothalamic–pituitary–adrenal axis (LHPA). The stress-controlling brain areas also react dynamically to stress and have long-term effects. Psychogenic stress can cause adaptive changes in the CNS leading to behavioral changes, gene activity or synaptic plasticity in the hippocampus. The epigenetic basis of such molecular adaptations in the brain lead to genome-wide epigenetic changes through DNA methylation due to chronic psychogenic stressors. Thus stress response to such psychogenic stressors has specific epigenetic mechanisms in the CNS.

Stressors are of course negative in character in the sense that they have an adverse effect on the organism. But nevertheless it shows that the states of the mind can and do affect the body. Changing over to a positive stance, we recognize that we have much more power than ever believed to influence our physical and mental realities. Our mindset is recognized by our body — right
down to the genetic level, and the more we improve our mental habits, the more beneficial response we get from the body. We can’t control what has happened in the past, which shaped the brain we have today, programmed our cells, and caused certain genes to switch on. However, we do have the power at this moment and in going forward to choose our perspective and behavior, which will change our brain, cells, and genes. A possible neuropsychological mechanism of thought-encoding could be that a repeated thought leads to its accentuation and then on a chain of events occurs as follows: thought neural circuit ⇒ mutation inheritance of mutated genetic pattern ⇒ as corresponding Neural-correlate-forming genes in the off-spring. Similar thought in the off-spring. 

Conclusion

Evolutionary Psychology has of late focused on different aspects of human cognition and the genetic effects produced by conscious experiences through such processes as DNA methylation. DNA methylation is a source of inter-individual phenotypic variation. Shea has proposed the concept of ‘inherited representation’ which takes into account genetic, epigenetic and cultural inheritance as factors determining the production of adaptive phenotypes.

On the other hand, the law of cause and effect finds a profound place in all the philosophies wherein it is clearly spelt out how actions by individuals with different motives lead them to different planes of experience. The operative principles behind the law of cause and effect are very deep and profound, allowing us to see life not as a set of random occurrences, but rather as a predictable formula of conscious free choice that can be molded and shaped to create the life we would like to experience and enjoy on a daily basis. Every human thought, word and deed is a cause that sets off a wave of energy throughout the universe which in turn creates the effect whether desirable or undesirable, resulting in the corresponding form of physical manifestation. Thus the whole universe is a physical manifestation of the giant evolutionary force of the cosmic urge using the genes only as the medium of its variegated operations.

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Conflicts of Interest: The authors declare no conflict of interest.

Ethical Clearance: Taken from the Head of the Institution for publication.

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Validation of Pregnancy Physical Activity Questionnaire (TAMIL)

Kavipriya S., B. Sathya Prabha, N. Venkatesh

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ABSTRACT

Background: Physical activity is very important during pregnancy for better maternal and foetal health. The physical activity during pregnancy varies with different periods of gestation. Therefore, the pregnancy physical activity is quite difficult to assess. The pregnancy physical activity questionnaire developed by Prof. Lisa Chasan Taber et al. (2004) is one of the few currently available questionnaires for measuring the physical activity during pregnancy. It was found to have few activities like mowing the lawn with mower which were not practiced in Tamil population thus there was a need to translate and culturally adapt the questionnaire.

Methodology: Total 75 mothers were screened and finally 50 participants were selected according to the inclusion and exclusion criteria. First session the mothers were administered with Tamil PPAQ and they were asked to fill details about past 7 days. The same was repeated after 1 week with English questionnaire for validation. In the last session, the mothers were administered with Tamil PPAQ for reliability analysis.

Results: Internal consistency analysis of the Tamil PPAQ using Cronbach’s alpha between the two Tamil PPAQ is good with the value 0.83. The test retest reliability was done between the Tamil PPAQ and English PPAQ by Intraclass correlation coefficient which ranged from good to excellent (0.81-0.95).

Conclusion: The Tamil PPAQ is a valid and reliable tool. It has good accuracy for the measurement of physical activity of various intensities and types among pregnant women.

Keywords: Pregnancy, trimesters, physical activity, Pregnancy Physical Activity Questionnaire.

Introduction

Maternal physical and physiological changes are normal adaptation during pregnancy to meet maternal and foetal needs. The changes occur in cardiovascular, hematologic, metabolic, renal, respiratory and skin. The alteration of body’s posture and weight gain results as the pregnancy progresses. Due to the maternal changes mothers experiences musculoskeletal disorders such as upper back pain, lower back pain, pelvic girdle pain, leg cramps, upper and lower limb pain.

Physical activity is very important during pregnancy for better maternal and foetal health. PA during pregnancy reduces the risk of several medical complications during pregnancy. Studies stated that active life style during pregnancy reduce the risk of gestational diabetes, hypertension during pregnancy. Moderate physical activity practice among uncomplicated pregnancy mothers may reduce and prevent the lower back pain, reduces the risk of cardiovascular stress, increases the aerobic capacity and helps in prevention of hypertension, gestational diabetes, vascular complications such as thrombosis and varicose veins during pregnancy. The awareness about the pregnancy physical activity and its benefits are not much publicized. There is some evidence that PA during pregnancy is associated with a reduced length of labor, reduced fatigue, stress, anxiety and depression as well as improved well-being, self-confidence and satisfied with appearance.

The Clinical Practice Obstetric Committee of Canada recommended that “all women without contraindications should be encouraged to participate in aerobic and strength- condition exercise as part of a healthy lifestyle during their pregnancy” 5,1. In spite of several recommendations on pregnancy PA, the prevalence across gestation yet seems to be low among
the obstetric population worldwide. The physical activity during pregnancy varies with different periods of gestation. Therefore, assessment of pregnancy physical activity is quite difficult to assess. An ideal measurement tool is needed to report the optimal physical activity during pregnancy.

The questionnaire is a simple, practicable, easy to administer tool for evaluating the physical activity during gestational period. Mostly antenatal physical activity levels rely on self reported assessment tools like questionnaires or physical activity recalls. Physical activity assessment tools, such as accelerometer and pedometers have been promoted as effective objective methods. Though many questionnaires have been developed and validated on physical activity in normal population, the items in those questionnaires could not be used for pregnant mothers. The pregnancy physical activity questionnaire (PPAQ) developed by Prof. Lisa Chasan Taber et al. (2004) is one of the few currently available questionnaire for estimating the pregnancy physical activity levels. It includes questions on trimester specific PA. PPAQ measures five areas such as occupation, household activities, child care activities and sports/exercises.

Translation process: Forward translation was done by an expert in Tamil language. Back translation was done by an expert who has good knowledge in both Tamil and English. Pilot trial was done in 5 mothers for any difficulties in understanding the language. After making further corrections, final draft of PPAQ-Tamil was developed.

Validation process: Total 75 mothers were screened and finally 50 participants were selected according to the inclusion (mothers with 32-36 weeks of gestation & mothers with working knowledge of English and Tamil.) and exclusion criteria (mothers in their first and second trimester, high-risk mothers with placenta previa, hypertension, cervical encirclement, seizure disorders, uncontrolled GDM, respiratory disease, renal disease, cardiac problems, history of previous miscarriage). A written informed consent was obtained from the mothers in their comfortable language. The study was conducted in 3 sessions, each with a gap of 7 days. First week the mothers were administered with Tamil PPAQ, they were asked to fill details about past 7 days. The same was repeated after 1 week with back translated English question for validation. In the last session, the mothers were administered with Tamil PPAQ for reliability analysis.

<table>
<thead>
<tr>
<th>Table 1: Participant’s baseline characteristics</th>
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<tbody>
<tr>
<td><strong>Baseline Characteristics</strong></td>
</tr>
<tr>
<td>Age (years)</td>
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<tr>
<td>Height (cm)</td>
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<tr>
<td>Weight (kg)</td>
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<tr>
<td>BMI (kg/m²)</td>
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<tr>
<td>Primipara n%</td>
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<td>Multipara n%</td>
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<table>
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<th>Table 2: Validation analysis</th>
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<tbody>
<tr>
<td><strong>PPAQ Subscales</strong></td>
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<tr>
<td><strong>ICC</strong></td>
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<tr>
<td>Total physical activity</td>
</tr>
<tr>
<td>Sedentary</td>
</tr>
<tr>
<td>Light</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>Vigorous</td>
</tr>
<tr>
<td>House hold</td>
</tr>
<tr>
<td>Sports and exercise</td>
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<tr>
<td>Occupation</td>
</tr>
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</table>

Cronbach’s Alpha-0.83
Results

The data obtained from the questionnaire in three sessions with 7 days gap from 50 pregnant women were used to analyze the reliability and validity of the PPAQ Tamil. Statistical analysis was done using the SPSS 23 version (Statistical package for social sciences). The test retest reliability and validity was assessed using Intraclass correlation coefficient and Cronbach’s alpha. Total 50 pregnant women were included in the study, out of which 50% were primipara and 50% were multipara. 48% were of 32 weeks of gestation, 26% were of 33 weeks of gestation and the rest 26% were of 34 weeks of gestation during their first session (Table-1).

The internal consistency of Tamil PPAQ was good with Cronbach’s alpha value of 0.83. The validity of the translated PPAQ was assessed using Intraclass correlation coefficient. The ICC value for total activities was good with the score of 0.89. The ICC values of the subscales of intensities such as sedentary, light, moderate and vigorous were 0.77, 0.93, 0.81, and 0.84 respectively. ICC values for subscales of type of activity were 0.91, 0.96 and 0.82 for household, sports & exercise and occupation respectively.

Discussion

Physical activity during pregnancy is one of the primary elements for healthy pregnancy to reduce the risk of medical complications. It is important for the healthcare providers to examine the pregnant women about physical activity level or practice. There is a lack of tool to measure the physical activity during the gestational period. The Pregnancy Physical Activity Questionnaire developed by Prof. Lisa Chasan Taber et al. (2004) found to be a valid tool. There were cultural variances in the activities specified in the questionnaire. The current study is the first attempt to translate and validate the Pregnancy Physical Activity Questionnaire in Tamil.

In PPAQ, the activities like mowing the lawn and riding the lawn mower were replaced with activities that were done by the pregnant mothers in Tamil population. There was also some difference in metric values like ‘gallons’ which were changed to ‘kilogram’. Changes were made with the permission from the author Lisa Chasan Taber. Similar cultural adaptations were made by other researcher also. In Vietnamese version ‘mowing the lawn using a walking mower’, ‘raking and gardening’ was removed, since these activities are not widespread in Vietnam. Instead activities related to riding bicycle or motorbike was added. The author also replaced ‘a car’ with ‘a motorbike’ as most of the people use bicycle or motorbike for transportation and the unit gallons was replaced with litres. In Polish version, question regarding riding the mower was removed and the number of questions was reduced from 36 to 35. French version ‘mowing the lawn using a walking mower’, ‘raking and gardening’, were adapted to ‘shovelling the snow’ according to the climatic condition. In Japanese version riding bicycle was added in going to places section, as riding bicycle is the basic mode of transportation for Japanese women. And also carrying one gallon of milk was replaced with carrying 3 kg rice bag. The Turkish version did not have any cultural variance but had difference in metric values and few instructions which were difficult to understand were changed. The Hindi and Marathi version replaced activities related to mowing the lawn with kitchen activities.

The Internal consistency analysis of the Tamil PPAQ using Cronbach’s alpha between the two Tamil PPAQ is good with the value 0.83 (Table 2). The Cronbach’s alpha value for Turkish PPAQ was under the recommended range 0.70-0.95. The test retest reliability was done between the Tamil PPAQ and English PPAQ by Intraclass correlation coefficient the internal consistency ranged from good to excellent with the ICC values 0.89, 0.77, 0.93, 0.81, 0.84, 0.91, 0.95 and 0.82 for total physical activity, sedentary, light, moderate, vigorous, house hold, sports and exercise and occupation respectively (Table 2). Lisa Chasan Taber et al. (2004) administered English PPAQ twice with seven days gap, polish PPAQ was administered twice with one week gap and both showed substantial level of reliability.

Limitations

The objective measure of physical activity level can be done with accelerometers and pedometers.

Screening first and second trimester mothers would have been more helpful to analyse the PA levels during pregnancy.
Conclusion

The translated and culturally adapted Tamil PPAQ is a valid and reliable tool with good accuracy for the measurement of physical activity of various intensities and types among pregnant women.

Ethical Clearance: Ethical approval for this study was obtained from Sri Ramachandra Medical College and Research Institute (Deemed to be University), Chennai. Informed consent obtained from all the study participants.

Source of Funding: Self

Conflict of Interest: None

REFERENCES


Effectiveness of Chlorhexidine Bath, Saline Bath and Standard Bath on Skin Health Status

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ABSTRACT

Introduction: The skin is the largest organ on our body which is not sterile but thousands of bacteria live on skin permanently. Bathing with various antiseptic solutions are practiced at hospital setting to remove all these microorganisms. Chlorhexidine wipes are the most commonly used medicated bath at hospitals. Though bathing with these medicated wipes are efficient in removing microorganisms than standard bathing with soap and water, the maintenance of skin health status of the individual need to be considered.

Objective: To assess the effectiveness of chlorhexidine, saline and standard bath on skin health status.

Method: An experimental was conducted among 102 subjects, selected using consecutive sampling and were randomly allocated to three groups (chlorhexidine, saline and standard bath). Skin health status of all subjects were assessed before, 2hrs and 24 hrs after the intervention by an individual who is blinded to the intervention using Neonatal skin assessment score.

Results: The mean skin health status scores were 3.03, 3.12, 3.03 at 2hrs 3.00, 3.06, and 3.00 at 24 hours in chlorhexidine, saline and standard bath respectively and were almost the same after the intervention in all three groups. This finding indicated that chlorhexidine and saline did not make any difference in the skin condition.

Conclusion: The present study supports the use of chlorhexidine, and saline wipes in children since it didn’t cause any adverse reactions, yet other studies conducted in neonates and infants alerts the health care professionals in using all these antiseptic wipes in children.

Keywords: Chlorhexidine bath, saline bath, standard bath, skin health status

Introduction

The skin is the largest organ on our body. The main role of the skin is to provide a barrier which prevents infection, the loss of water from the body, and penetration of irritants and allergens. These functions depend on the maintenance of skin integrity. The skin also acts as a barrier that limits invasion and growth of pathogenic bacteria, which include the mechanical rigidity of the stratum corneum, its low moisture content, stratum corneum lipids, production of lysozyme, acidity (pH 5), and defences.

Skin is also excellent at absorbing things, any products you put on the skin gets absorbed easily. It is a great advantage for getting beneficial remedies into our body through bathing. But unfortunately, the skin will also absorb all the toxins and artificial chemical ingredients found in so many skin care and beauty products.

Skin is not sterile. Indeed, thousands of bacteria live on skin permanently and contribute to health by maintaining a steady colony that inhibits establishment of harmful yeast and fungal infections. These bacterial populations are referred to as the ‘resident flora’. A number of bacteria are present on the skin for a short period due to transfer from other people or the environment, and these constitute the ‘transient flora’.

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Bathing is the commonly used hygienic measure which can do more than refresh, cleanse and hydrate your skin, it’s also a great way to relax and decompress from a stressful day. As it discussed earlier skin bacteria live naturally in the outer keratinized layers of the epidermis, and it follows that bathing with water or with dilute solutions of surface-active agents will remove many of that microorganisms like Staph, MRSA and other pathogens on the skin. 

Soap has been used for bathing for many decades, but trends has changed recently. Doctors often prescribe bleach baths and baths with chemically laden disinfectants to people with stubborn Staph and MRSA skin infections. While these MRSA baths and Staph baths may kill infecting bacteria on your skin, they can also kill off the good bacteria that help protect your skin. Though bleach and toxic chemical disinfectants can remove the pathogens from the skin, it can also weaken your immune system, cause skin irritations and allergic reactions.

Bathing with antiseptic solutions has become common in health care setting too. Chlorhexidine gluconate (CHG) is a routinely used antiseptic to disinfect skin in a variety of product types in healthcare settings. It is a broad-spectrum antiseptic which is effective against pathogens.

CHG is known to adhere to and remain on skin even after rinsing with water. When used in pre-operative skin preparations and pre-surgical hand disinfectants, CHG slows repopulation of the resident flora for hours after the initial use (persistence). It has been suggested that residual CHG can kill transient organisms contaminating the skin long after product application. CHG-based products are used frequently in the healthcare setting for peripheral and central venous catheter (CVC) site skin preparation, daily bathing of intensive care unit patients, full-body newborn skin cleansing, umbilical cord care, and Staphylococcus aureus decolonization.

At present, whole body bathing or showering with skin antiseptic in order to prevent surgical site infection is a widespread practice before surgery. The aim of washing is to make the skin as clean as possible by removing transient flora and some resident flora.

Though chlorhexidine and other disinfectant solutions like saline are good at removing the pathogens from the skin, concerns regarding skin breakdown were the most common reservations that health professionals have cited for their hesitation to use CHG. The poor skin integrity may be a significant factor in the most of the client’s.

It is also very important to consider that baby’s skin has a less developed epidermal barrier than adults and thus is more prone to damage; recent research suggests that the stratum corneum of infants becomes ‘adult-like’ only after one year of life. Also, most areas of skin are dry, creating an unfavorable environment for bacterial replication.

The researcher felt that maintenance of skin health is equally important as removing pathogens from the skin. And as said before skin of the children are at more risk than of adult population. So the present study is aimed at assessing the effectiveness of chlorhexidine, saline and standard bath on the skin health status of children.

Method

The study was conducted among 102 children who got admitted to the pediatric wards of a tertiary care hospital, Vellore. Subjects were selected using non-probability consecutive sampling. Written consent was obtained from the parents of the subjects after explaining the purpose of the study. After getting the consent the researcher randomly allotted the subjects into three groups by using a random table numbers. Skin health status of all subjects were assessed before the intervention, 2hrs and 24 hrs after intervention by an individual who is blinded to the intervention using Neonatal skin assessment score. Which is a standardized validated tool developed by Association of Women’s health obstetric and neonatal nurses (AWHONN) in collaboration with National Association of Neonatal Nurses (NANN). Which assess the skin health status in terms of dryness, erythema and excoriation. Reliability of this tool is done by using interrater reliability which is 0.7 and interrater reliability is 0.6. It has also been validated in a population of older child. Data was analyzed using descriptive and inferential statistics. Ethical clearance was obtained from Institutional review board.
Results

Table 1: Distribution of children according to their demographic variable

<table>
<thead>
<tr>
<th>Demographic Variable No.</th>
<th>Chlorhexidine bath</th>
<th>Saline bath</th>
<th>Standard bath</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant</td>
<td>13</td>
<td>38.2</td>
<td>16</td>
<td>47.1</td>
</tr>
<tr>
<td>Preschooler</td>
<td>12</td>
<td>35.3</td>
<td>10</td>
<td>29.4</td>
</tr>
<tr>
<td>Schooler</td>
<td>9</td>
<td>26.5</td>
<td>8</td>
<td>23.5</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>40.2</td>
<td>34</td>
<td>33.3</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21</td>
<td>61.8</td>
<td>22</td>
<td>64.7</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>38.2</td>
<td>12</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>38.2</td>
<td>14</td>
<td>41.2</td>
</tr>
<tr>
<td>Area of living</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>22</td>
<td>64.7</td>
<td>25</td>
<td>73.5</td>
</tr>
<tr>
<td>Urban</td>
<td>12</td>
<td>35.3</td>
<td>9</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>30.4</td>
<td>10</td>
<td>29.4</td>
</tr>
<tr>
<td>Socio economic status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower class</td>
<td>11</td>
<td>32.4</td>
<td>17</td>
<td>50.0</td>
</tr>
<tr>
<td>Middle class</td>
<td>15</td>
<td>44.1</td>
<td>13</td>
<td>38.2</td>
</tr>
<tr>
<td>Upper class</td>
<td>8</td>
<td>23.5</td>
<td>4</td>
<td>11.8</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>22.5</td>
<td>11</td>
<td>32.4</td>
</tr>
</tbody>
</table>

Table 1 shows that majority (40.2%) of children were in the age group of infant (0-1years) and 61.8% were males. More than half (69.6%) children were from rural community and most (39.2%) were from middle class socioeconomic status.

From the above figure it’s clear that bathing with chlorhexidine did not make any change in the skin health status of the children.

Figure 1: Distribution of children who received chlorhexidine bath based on their skin heath status.

N = 102 (n = 34)

Figure 2: Distribution of children who received saline bath based on the skin heath status.

N = 102 (n = 34)
From the above figure it’s clear that 91% of them had perfect score before and after 2hrs of saline bath but after 24 hrs 94% of them had perfect score.

\[ N = 102 \ (n = 34) \]

![Skin health status](image)

**Figure 3: Distribution of children who received standard bath (soap and water) based on the skin heath status**

From the above figure it’s clear that after 24 hrs. of standard bath all the subjects had a perfect score.

**Table 2: Effect of chlorhexidine bath, saline bath and standard bath on skin health status after 2hrs**

<table>
<thead>
<tr>
<th></th>
<th>Mean square</th>
<th>df</th>
<th>F value</th>
<th>pvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between group</td>
<td>0.088</td>
<td>2</td>
<td>1.169</td>
<td>0.315</td>
</tr>
<tr>
<td>Within group</td>
<td>0.075</td>
<td>99</td>
<td></td>
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</tr>
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</table>

From the above table it’s clear that there was no significant difference in the mean skin health status of subjects after 2 hrs. of intervention.

**Table 3: Effect of chlorhexidine bath, saline bath and standard bath on skin health status after 24hrs**

<table>
<thead>
<tr>
<th></th>
<th>Mean square</th>
<th>df</th>
<th>F value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between group</td>
<td>0.078</td>
<td>2</td>
<td>2.062</td>
<td>0.133</td>
</tr>
<tr>
<td>Within group</td>
<td>1.882</td>
<td>99</td>
<td></td>
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</table>

From the above table it’s clear that there was no significant difference in the mean skin health status of subjects after 24 hrs. of intervention.

**Discussion**

Skin is the largest sense organ of our body. Each individual’s skin reacts differently to the application of solutions, especially medicated ones. It has been documented that chlorhexidine causes side effects like itching, swelling and chest tightness in some individuals (PubMed Health, 2015). Saline has been proven to be a gentle skin cleanser because of it’s isotonic properties. As the present study included two types of solutions in addition to soap and water, assessing the skin status to look for any reactions to the agents used for bathing became vital. The skin health in terms of erythema, dryness and breakdown was assessed using the Neonatal skin condition score. The skin assessment was done by a second person who was blinded to the intervention.

The analysis of the present study revealed that majority of the children (95%) had perfect score (that is 3) during the pre-assessment. At 2hrs of intervention majority (97%) in chlorhexidine, (91%) in saline and (97%) in standard bath had perfect score, and at 24 hours 97%, 94% and 100% in chlorhexidine, saline, standard bath respectively had perfect score. The mean
scores were 3.03, 3.12, 3.03 at 2hrs 3.00, 3.06, and 3.00 at 24 hours in chlorhexidine, saline and standard bath respectively and were almost the same after the intervention in all three groups. This finding indicated that chlorhexidine and saline did not make any difference in the skin condition in terms of erythema or dryness and breakdown.

These findings are comparable with the similar study done by Shankar et al. (2009) among 60 infants (20 in each group chlorhexidine, saline and non-cleansing) admitted in a neonatal intensive care unit of a tertiary care hospital. The study could not find any significant difference in the skin condition between the three groups, and none of the infants developed erythema or fissuring of the skin and the median scores were same in all three groups. Similar results have been reported from other studies too. It is also supported by two other studies done by Darmstadt et al. (2007) and Mullany et al., (2008) in neonates which reported that cleaning with chlorhexidine had no adverse effects on skin condition. The cleansing treatment was not associated with any skin irritation. Whereas dry skin with scales was reported in one infant from each of the treatment groups prior to the intervention, and again at 2 hours after the intervention.

The results are, however, in contrast with the observation by Garland et al., who found localized contact dermatitis after the use of chlorhexidine–gluconate impregnated dressing and hence were not in favor of its prolonged use in infants. It is contrary to the findings of the study by Montecalvo et al., (2012) who noted skin rashes and thrombocytopenia after the skin was cleansed with 2% chlorhexidine.

Another study conducted in neonatal intensive care units of United States, where twenty-eight participants (51%) who used CHG in their NICU reported adverse reactions. All were skin reactions and included erythema (32%), erosions (7%), or burns (61%)

**Conclusion**

Skin cleansing with antiseptic solutions during hospitalization are very efficient in removing the pathogens/ microorganisms from the body and thus by preventing nosocomial infections and reducing the hospital stay. But at the same time maintenance of a good skin health status is also important especially in children. The present study supports the use chlorhexidine, and saline wipes since it didn’t cause any adverse reactions in children, yet other studies conducted in neonates and infants alerts the health care professionals in using all these antiseptic wipes in children.

**Conflict of Interest:** Nil

**Source of Funding:** Institutional Review Board, Christian Medical College, Vellore

**Ethical Clearance:** Ethical clearance was obtained from Institutional Review Board of Christian Medical College, Vellore. Permission for conducting the study at pediatric department was obtained from the respective Head of the Department. Informed consent was obtained from the children and informed assent was obtained from the parents for conducting the study.

**REFERENCES**


Determinants of Uptake of Cervical Cancer Screening in Northern India

Divya Khanna¹, Sunita Vashist², Anuradha Khanna³, Ajay K. Khanna⁴

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ABSTRACT

Background: The launch of operational framework for India’s first national cancer screening programme in 2016 was a landmark event in the background of poor screening coverage status. Our study aims to determine the factors deciding the uptake of cervical screening amongst women in rural India.

Method: A cross-sectional, observational study was carried out amongst the women attending a secondary health centre of a district from Northern India. A total of 1250 women aged above 30 years who were never diagnosed or treated for cervical cancer were enrolled. After taking informed consent all women were interviewed about their bio-social profile and if they ever underwent screening of cervical cancer. Chi-square or Fisher’s exact test was applied to find out significant difference in distribution of bio-social variables (predictors) amongst the study population. The significant predictor variables were subjected to Binary and Multiple Logistic Regression. Unadjusted and Adjusted Prevalence Odds Ratio with 95% Confidence Interval were generated.

Results: Religion, working status of the women, history of multiple sexual contacts were important factors influencing the utilization of screening.

Conclusion: We conclude that cervical cancer screening is a cost-effective strategy in saving lives. We can tap its benefits only when we identify and remove the hurdles in the utilization of cervical cancer screening.

Keywords: Screening, Cancer Cervix, India, Uptake Determinants

Introduction

The launch of operational framework for India’s first national cancer screening programme in November 2016 was a landmark event for the country in background of poor screening coverage status.¹ Opportunistic screening in various regions of India varied from 6.95 in Kerala to 0.006% and 0.002% in the western state of Maharashtra and Tamil Nadu respectively.²⁻⁵ Most of the women who cannot tap the benefit of early screening present with advanced and late stages and treatment in these stages which leaves the women both financially and prognostically weaker resulting in poor compliance.⁶⁻⁷ Compared with other cancers, screening for cervical cancer is the most effective.⁸ However geographical, economic, social and gender based factors may serve as barriers for the women to reach out for screening especially in a low resource settings.⁸⁻¹¹ Thereby our study aims to determine the factors working in background which decide the uptake of cervical screening amongst women attending a rural health care setting from Northern India.

Method

A cross-sectional, observational study was carried out amongst the women attending a secondary health
care centre of Ghaziabad, a district from Northern state of India (Uttar Pradesh). All of the women aged above 30 years who were never diagnosed or treated for cervical cancer were enrolled. The duration of the study was one year (October 2016-October 2017). A total of 1250 women were enrolled during the reference period through purposive sampling. Based on the study of Everlyne et al\textsuperscript{12} that estimated proportion of women having no awareness for cervical cancer amongst women who underwent cervical cancer screening to be 35% and women who never underwent screening to be 69% our sample collected satisfied the required sample size calculated using G*Power 3.1.9.2 at 95% confidence levels, 80% power of the study and 5% margin of error.

A semi-structured scheduled was designed seeking information about the socio-demographic profile, personal and sexual history, family history of cervical cancer and past history of Diabetes Mellitus (DM), gynecological complaints such as history of excess vaginal discharge, post coital-bleeding, inter-menstrual bleeding, awareness of cervical cancer and history of Human Papilloma Virus (HPV) vaccination. For awareness of cervical cancer women were asked to enumerate at-least two correct symptoms of cervical cancer. Finally women were asked if they ever underwent screening of cervical cancer.

Statistical analysis was performed using IBM SPSS version 16.0. Results were expressed in frequencies and percentages for categorical variables and Mean ± Standard deviation for continuous variables. The data collected for bio-social predictor (independent) variables was converted as categorical data and chi-square or Fisher’s exact tests was applied to find out the statistically significant difference in proportions of predictor variables amongst the women who had undergone cervical screening and who had not. The predictor variables found statistically significant were then subjected to binary logistic regression and Unadjusted Prevalence Odds Ratio (UPOR) with 95 % Confidence Interval (CI) was generated. These variables were then subjected to Multiple Logistic Regression in order to control the effect of confounding and Adjusted Prevalence Odds Ratio (APOR) with 95% CI was generated. The dichotomous outcome was whether the woman has ever undergone cervical cancer screening or not. For all the statistical tests a two-sided p value of <0.05 was considered as statistically significant.

Ethical Consideration: The study was initiated after getting clearance from the Ethical Board Committee of the Santosh Medical University, Ghaziabad, Uttar Pradesh, India. The objective, the purpose and the method of the study were explained to all the participants in their local easy to understand language. An informed consent, in the local language was obtained from all the participants who were eligible for the study.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sub-category</th>
<th>Undergone Screening (%)</th>
<th>Total (%)</th>
<th>Unadjusted Odds ratio with 95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>31(4.6)</td>
<td>681(54.5)</td>
<td>3.8(1.7-8.7)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>7(1.2)</td>
<td>569(45.5)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Literacy status</td>
<td>Literate</td>
<td>31(4.7)</td>
<td>588(47.0)</td>
<td>4.1(1.8-9.3)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>7(1.2)</td>
<td>662(53.0)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Working status of the women</td>
<td>Working</td>
<td>10(12.8)</td>
<td>78(6.2)</td>
<td>6.0(2.8-12.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Housemaker</td>
<td>28(2.4)</td>
<td>1172(93.8)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Working status of the Husband</td>
<td>Professional</td>
<td>17(11.0)</td>
<td>155(12.4)</td>
<td>6.3(3.2-12.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Semi-/un-/skilled workers</td>
<td>21(1.9)</td>
<td>1095(87.6)</td>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Distribution of the factors influencing uptake of cervical screening amongst the study population according to their cervical screening status (n = 1250)

<table>
<thead>
<tr>
<th>Details of the Women</th>
<th>Sub-category</th>
<th>Undergone Screening (%)</th>
<th>Total (%)</th>
<th>Unadjusted Odds ratio with 95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple sexual contacts</td>
<td>Yes</td>
<td>3(17.6)</td>
<td>17(1.4)</td>
<td>6.8(1.9-24.7)</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>35(2.8)</td>
<td>1233(98.6)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>History of HPV vaccination</td>
<td>Yes</td>
<td>3(50)</td>
<td>6(0.5)</td>
<td>34.5(6.7-177.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>35(2.8)</td>
<td>1244(99.5)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Awareness of cervical cancer</td>
<td>Present</td>
<td>36(9.6)</td>
<td>374(29.9)</td>
<td>46.5(11.1-194.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Absent</td>
<td>2(0.2)</td>
<td>876(70.1)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Family History of cervical cancer</td>
<td>Yes</td>
<td>9(7.0)</td>
<td>128(10.2)</td>
<td>2.8(1.3-6.1)</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>29(2.6)</td>
<td>1122(89.8)</td>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>

Details of the Husband

| Tobacco intake (smoking/chewing)         | Yes          | 14(1.8)                  | 772(61.8) | 0.35(0.2-0.7)                     | 0.002   |
|                                         | No           | 24(5.0)                  | 478(38.2) | Reference                         |         |
| Alcohol                                 | Yes          | 7(1.5)                   | 473(37.8) | 0.36(0.2-0.8)                     | 0.016   |
|                                         | No           | 31(4.0)                  | 777(62.2) | Reference                         |         |

Table 3: Factors influencing the uptake of cervical screening after adjustment with Multiple Logistic Regression (n = 1250)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Sub-category</th>
<th>Adjusted Odds ratio with 95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>3.9(1.6-9.6)</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Working status of the women</td>
<td>Working</td>
<td>3.6(1.5-8.6)</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Housemaker</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Multiple sexual contacts of the women</td>
<td>Yes</td>
<td>7.9(1.7-36.6)</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>History of HPV vaccination</td>
<td>Yes</td>
<td>19.8(2.9-131.3)</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Husband taking alcohol</td>
<td>Yes</td>
<td>0.30(0.12-0.78)</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>History of Inter-menstrual bleeding</td>
<td>Yes</td>
<td>3.7(1.9-13.8)</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Awareness of cervical cancer</td>
<td>Present</td>
<td>34.2(7.0-167.4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Absent</td>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>

Results

A total of 1250 women in the age group between 30 to 70 years who visited the Obstetrics and Gynecology unit of secondary health care centre were enrolled. The mean age of the participants was 40.35±3.73 with an age range of 30-65 years. The proportion of women who had undergone cervical cancer screening was 3.04%. Less than one-third (29.9%) of the women had awareness of cervical cancer. (Table-2)

Biosocial characteristics: Majority of the study participants were from rural background (67.8%). More than half (53%) were Illiterate. Women who were from Hindu background were nearly four times more likely to report undergoing cervical screening than women from Muslim background. Literate mothers were also four times more likely to report undergoing screening compared to mothers who were illiterate. Working women were six times more likely to report undergoing screening compared to mothers who...
Discussion

We observed that the proportion of women who reported undergoing cervical cancer screening was just 3.04%. Our finding is in line with several studies from India which report poor screening coverage in Indian setup. 2-5 Less than one-third (29.9%) of the women were aware about cervical cancer. Awareness of cervical cancer reported from Indian studies showed variations according to the parameters used for awareness and the geographically area chosen for the study.13-16

We observed that literate women, women who are working are more likely to undergo screening for cancer cervix. Our finding is in concordance with findings from other studies. 17,18 Women who were Muslim by religion were less likely to undergo screening. This can be partly explained due to their social customs which reduces the risk of development of cervical cancer. A study from Southern India has reported statistically significant ratios for cervical cancer amongst Hindus (2.5 times) and Christians (1.9 times) compared to Muslim women. The incidence rate for penile cancer was 2.2 per 100000 among Hindus, 0.8 among Christians and nil among Muslims.19

Woman, whose husband was working professionally and was not consuming alcohol or tobacco, was more likely to undergo screening. This finding reflects that husbands do have role in influencing the health seeking behavior of the women. Studies from Indian setup and other developing countries have stated how woman lacks the decision making power and depends on her husband for seeking health care.11,20

Multiple sexual contacts of the women positively influenced uptake of screening. This may be due to the fact that women having multiple sexual contacts were likely to be aware of the risk of cancer and thus are more likely to undergo screening. Our finding is supported by another study from Nigeria.21 Women who were aware about the cervical cancer, who had received HPV vaccination in past, had positive family history of cervical cancer or had complaints related to cervical cancer such as post-coital and inter-menstrual bleeding 22 were more likely to report for cervical cancer screening.

Personal History of the women and their husband: It was observed that women who had multiple sexual contacts were nearly seven times more likely to report undergoing cervical cancer screening compared to women who never had multiple sexual contacts. Women whose husbands were regularly consuming tobacco (chewing/smoking) and alcohol reduced the chances of reporting undergoing cervical cancer screening by 65% and 63% respectively compared to women whose husband were not consuming tobacco and alcohol. (Table-2) No statistically significant difference in proportion was observed for smoking status of the women and history of multiple sexual contacts of the husbands amongst the study population.

Cervical cancer related history: Only six women (0.5%) reported to have received HPV vaccination. Women who had been vaccinated for HPV were thirty-four times more likely to report undergoing cervical cancer screening than women who were never vaccinated. Also women who reported positive family history of cervical cancer were nearly three times more likely to report undergoing cervical cancer screening. Women who were aware about cervical cancer were nearly forty-six times more likely to report undergoing screening compared to mothers who were never vaccinated. Also women who reported positive family history of cervical cancer were more likely to report for cervical cancer screening.

Predictors of uptake of cervical cancer screening: After adjusting all the variables found significant on bivariate analysis, using multiple logistic regression it was observed that women who were Hindu by religion, working, having history of multiple sexual contacts, receiving HPV vaccination, having inter-menstrual bleeding and being aware of cervical cancer were more likely to undergo cervical cancer screening than their counter-parts. On the other hand women whose husbands were regularly consuming alcohol were less likely to report for screening compared to women whose husbands do not consume alcohol. (Table-3)
screening. This finding suggests that women who got aware about cervical cancer either through a positive health experience of health education and vaccination or a negative experience through family history of developing cervical cancer are more likely to undergo screening.

**Conclusion**

We conclude that both positive and negative aspects of the biosocial profile of the woman influence her uptake in screening. Cancer screening is a cost effective strategy in saving lives. We can tap its benefits only when we identify and remove the hurdles and encourage positive environment such as literacy, women empowerment through self-reliance and decision making power, health promotion activities through awareness and HPV vaccination which will significantly influence utilization of cervical cancer screening.

**Conflict of Interest:** None

**Source of Funding:** None

**REFERENCES**


12. Morema EN, Atieli HE, Onyango RO, Omondi JH, Ouma C. Determinants of cervical screening services uptake among 18–49 year old women seeking services at the Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu, Kenya. BMC health services research. 2014 Dec;14 (1):335.


A Study on Pattern and Outcome of Poisoning Cases in a Tertiary Care Hospital in Andhra Pradesh, India

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ABSTRACT

Objectives: The study aims to assess the patterns, severity and clinical outcome of poisoning incidents among the peoples admitted in a tertiary care hospital, Rajahmundry, India.

Method: A retrospective assessment was conducted over a period of one year in a tertiary care teaching hospital; data was collected from the medico-legal case register of the hospital. The data needed for the study was collected using an appropriate data collection form.

Results: The study involved 187 patients with a mean age of 27.95±10.38 years. The commonly used poisoning agent was pesticides (n=111). The intentional poisoning incident was (n=183) higher than accidental (n=4) poisoning. Male (n=103) populations were more prone to commit suicide compared to the female (n=84) population. The literates (n=155) are predominantly higher among the population. The poisoning ratio was higher in the rural (n=131) population compare to urban (n=27) and semi urban (n=29) population.

Conclusions: A majority of patients whose severity of illness was predicted to be mild to moderate recovered from the poisoning. In contrast, patients whose illness was predicted to be severe were either discharged with severe morbidity or deceased.

Keywords: Deliberate poisoning, parasuicide, pattern, clinical outcome, Glasgow coma scale

Introduction

Deliberate poisoning, when it is nonfatal, and particularly when it is grouped together with self-injury, is also called deliberate self-harm (DSH)¹, attempted suicide or parasuicide. It is estimated that 200,000 people die due to poisoning in the world². In young adults it appears to be an almost accepted pattern of social behaviour and, as a result, it has become a major medical problem in both social and economic terms³. The World Health Organization’s definition of parasuicide in a recent international study was: ‘An act with nonfatal outcome, in which an individual deliberately initiates a no habitual behaviour that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage and which is aimed at realizing changes which the subject desired via the actual or expected physical consequences⁴. A parasuicide episode may be defined as the self- exposure of an individual (by ingestion or inhalation) to an amount of substance associated with the significant potential to cause harm. Parasuicide is one of the commonest acute medical presentations in the Emergency Department⁵. The occurrence of parasuicide with toxic substances (e.g., pesticides, household products, and medicines) has been a major concern worldwide. Parasuicide is heterogeneous and may be indicative of psychological disorders including: alcohol and substance abuse,

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eating disorders, dissociative, somatoform, or body dysmorphic disorders, depression and anxiety disorders, posttraumatic stress disorder, or several personality disorders and schizophrenia. Poisoning occurs as a result of agricultural use, accidental exposure, suicide and, rarely, homicide. In a retrospective study of suicide, we found that the interval between first suicidal behaviour and the suicide was related to the patient’s sex and mental disorder. In developing country like India, it predominantly occurs in young people impulsively responding to stressful events who have little desire to die. Deaths are rare, since the medicines ingested are of low toxicity or easily treated. This study aimed to identify the poisoning and its properties in an agricultural area of East Godavari district, Andhra Pradesh, India, with the expectation that such knowledge will direct future campaigns to prevent self-harm, thereby preventing the deaths due to suicides with timely intervention.

Method

Research Design: A retrospective hospital based study was conducted to determine the pattern of poisoning from the medico-legal case register dated January 2008 to January 2018.

Study Population: People who consumed any chemical, drugs, plants or any substance intentionally or unintentionally poisoning cases were identified from the medico-legal case register. Animal poisoning or any other form of suicide (hanging or using weapon) are excluded. Relevant data was collected from the patients’ case notes, treatment charts, nursing notes, laboratory reports and discharge summaries.

Sample Size: A total of 256 case was found in the medico-legal case register. We added 187 case according to the inclusion criteria. Using an appropriate data collection form, data are collected from the case register. A data related to socio demographic, poison, treatment, severity indicators, and actual outcome.

Assessment of Severity of Poisoning: As per the severity indicators of GCS the data was collected and assessed to determine the severity score/level/grade of patients. GCS scores were calculated on the basis of motor response to pain, and verbal and eye responses.

<table>
<thead>
<tr>
<th>Poisoning agent</th>
<th>Patients (n (%)</th>
<th>Reason of poisoning</th>
<th>Patients (n (%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticides</td>
<td>111 (59.36)</td>
<td>Family problems</td>
<td>78 (41.71)</td>
</tr>
<tr>
<td>Organophosphorus</td>
<td>68 (36.36)</td>
<td>Financial problem</td>
<td>43 (22.99)</td>
</tr>
<tr>
<td>Organochlorides</td>
<td>4 (2.14)</td>
<td>Impulsive</td>
<td>14 (7.49)</td>
</tr>
<tr>
<td>Pyrethroids</td>
<td>4 (2.14)</td>
<td>Parasuicide</td>
<td>5 (2.67)</td>
</tr>
<tr>
<td>Carbamate Poisoning</td>
<td>3 (1.6)</td>
<td>Love affair</td>
<td>17 (9.09)</td>
</tr>
<tr>
<td>Fungicide</td>
<td>4 (2.14)</td>
<td>Depression/Psychiatric problem</td>
<td>8 (4.28)</td>
</tr>
<tr>
<td>Rat Killer</td>
<td>9 (4.81)</td>
<td>Study stress</td>
<td>22 (11.76)</td>
</tr>
<tr>
<td>Ant Killer</td>
<td>13 (6.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herbicide</td>
<td>6 (3.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicines</td>
<td>32 (17.11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracetamol</td>
<td>2 (1.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>14 (7.49)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorpheniramine</td>
<td>1 (0.53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi Drug Poisoning</td>
<td>13 (6.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroxine</td>
<td>2 (1.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others Classification*</td>
<td>44 (23.53)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Chemical, Plant and Household materials.
Table 2: Categorization of Poisoning Incidents as Per the Age, Marital Status, Occupation, Place of Residence, and Educational Background of Patients

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Patients (n (%))</th>
<th>Male</th>
<th>Female</th>
<th>Total (n=187)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15</td>
<td></td>
<td>0</td>
<td>3 (1.6)</td>
<td>3 (1.60)</td>
</tr>
<tr>
<td>16-25</td>
<td></td>
<td>52 (27.81)</td>
<td>48 (25.67)</td>
<td>100 (53.48)</td>
</tr>
<tr>
<td>26-35</td>
<td></td>
<td>31 (16.58)</td>
<td>22 (11.76)</td>
<td>53 (28.34)</td>
</tr>
<tr>
<td>36-45</td>
<td></td>
<td>14 (7.49)</td>
<td>6 (3.21)</td>
<td>20 (10.70)</td>
</tr>
<tr>
<td>46-55</td>
<td></td>
<td>3 (1.6)</td>
<td>2 (1.07)</td>
<td>5 (2.67)</td>
</tr>
<tr>
<td>&gt;56</td>
<td></td>
<td>3 (1.6)</td>
<td>3 (1.6)</td>
<td>6 (3.21)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td>52 (27.81)</td>
<td>54 (28.88)</td>
<td>106 (56.68)</td>
</tr>
<tr>
<td>Unmarried</td>
<td></td>
<td>48 (41.71)</td>
<td>30 (16.04)</td>
<td>78 (41.71)</td>
</tr>
<tr>
<td>Divorced</td>
<td></td>
<td>3 (1.60)</td>
<td>0</td>
<td>3 (1.60)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td>36 (19.25)</td>
<td>13 (6.95)</td>
<td>49 (26.2)</td>
</tr>
<tr>
<td>Farmers</td>
<td></td>
<td>15 (8.02)</td>
<td>0</td>
<td>15 (8.02)</td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td>25 (13.37)</td>
<td>2 (1.07)</td>
<td>27 (14.44)</td>
</tr>
<tr>
<td>Home Maker</td>
<td></td>
<td>2 (1.07)</td>
<td>47 (25.13)</td>
<td>49 (26.20)</td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td>21 (11.23)</td>
<td>22 (11.76)</td>
<td>43 (22.99)</td>
</tr>
<tr>
<td>Salaried</td>
<td></td>
<td>4 (2.14)</td>
<td>0</td>
<td>4 (2.14)</td>
</tr>
<tr>
<td>Place of residence/demography</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td>72 (38.5)</td>
<td>59 (31.55)</td>
<td>131 (70.05)</td>
</tr>
<tr>
<td>Semi urban</td>
<td></td>
<td>15 (8.02)</td>
<td>12 (6.42)</td>
<td>27 (14.44)</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>46 (24.6)</td>
<td>13 (6.95)</td>
<td>29 (15.51)</td>
</tr>
<tr>
<td>Educational background</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td></td>
<td>18 (9.63)</td>
<td>14 (7.49)</td>
<td>32 (17.11)</td>
</tr>
<tr>
<td>Below Primary</td>
<td></td>
<td>10 (5.35)</td>
<td>10 (5.35)</td>
<td>20 (10.70)</td>
</tr>
<tr>
<td>Secondary</td>
<td></td>
<td>15 (8.05)</td>
<td>16 (8.56)</td>
<td>31 (16.58)</td>
</tr>
<tr>
<td>Higher secondary</td>
<td></td>
<td>19 (10.16)</td>
<td>11 (5.88)</td>
<td>30 (16.04)</td>
</tr>
<tr>
<td>Graduates</td>
<td></td>
<td>20 (10.7)</td>
<td>12 (6.42)</td>
<td>32 (17.11)</td>
</tr>
</tbody>
</table>

Table 3: Categorization of Poisoning Incidents as Per the Socio-Economic Status and Demography in Relation to Poisoning Agents

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Patients (n (%))</th>
<th>Pesticides</th>
<th>Medicines</th>
<th>Household Products</th>
<th>Plant Poison</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-Economic background</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>12 (6.42)</td>
<td>6 (3.21)</td>
<td>3 (1.6)</td>
<td>10 (5.35)</td>
<td>31 (16.58)</td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>68 (36.36)</td>
<td>24 (12.83)</td>
<td>4 (2.14)</td>
<td>43 (22.99)</td>
<td>139 (74.33)</td>
<td></td>
</tr>
<tr>
<td>Rich</td>
<td>6 (3.21)</td>
<td>4 (2.14)</td>
<td>1 (0.53)</td>
<td>6 (3.21)</td>
<td>17 (9.09)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>86 (45.99)</td>
<td>34 (18.18)</td>
<td>8 (4.28)</td>
<td>59 (31.55)</td>
<td>187(100)</td>
<td></td>
</tr>
</tbody>
</table>
Conted...

<table>
<thead>
<tr>
<th>Place of residence/demography</th>
<th>Rural (n=187 patients)</th>
<th>Semi-urban (n=187 patients)</th>
<th>Urban (n=187 patients)</th>
<th>Total (n=187 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>64 (34.22)</td>
<td>22 (11.76)</td>
<td>6 (3.21)</td>
<td>131 (70.05)</td>
</tr>
<tr>
<td>Semi-urban</td>
<td>12 (6.42)</td>
<td>4 (2.14)</td>
<td>1 (0.53)</td>
<td>29 (15.51)</td>
</tr>
<tr>
<td>Urban</td>
<td>10 (5.35)</td>
<td>8 (4.28)</td>
<td>1 (0.53)</td>
<td>27 (14.44)</td>
</tr>
<tr>
<td>Total</td>
<td>86 (45.99)</td>
<td>34 (18.18)</td>
<td>8 (4.28)</td>
<td>187 (100)</td>
</tr>
</tbody>
</table>

Table 4: Prediction of Severity and Categorization of Patients as Per the Severity and Clinical Outcome (Improved, discharged with Severe Morbidity and Deceased) Using Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Glasgow Coma Scale</th>
<th>Patients (n (%))</th>
<th>Outcome group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improved</td>
<td>Discharged with severe morbidity</td>
</tr>
<tr>
<td>Mild ≥ 13</td>
<td>161 (86.09)</td>
<td>13 (6.98)</td>
</tr>
<tr>
<td>Moderate 9-12</td>
<td>2 (1.07)</td>
<td>1 (0.53)</td>
</tr>
<tr>
<td>Severe ≤ 8</td>
<td>8 (4.28)</td>
<td>0</td>
</tr>
</tbody>
</table>

Results

Patterns of Poisoning: The patterns of poisoning based on the data collected from the hospital are given in the Table1. Pesticides are the most highly used substance for poisoning (n=111), followed by Medicines (n=32); other substance (n=44) and Plant poisons (n=4). All the patients admitted for poisoning cases belongs to intentional (n=183), only (n=4) is unintentional. The major route of exposure was by oral (n=187),

Socio-Demographic Patterns of Poisoning: The incidents of poisoning was categorized by age, marital status, occupation, place of residence, and educational background, the results are given in the Table2. The age range of the patients is between 12 to 73 with a mean±S.D. age of 27.95±10.38 years. The ratio of male to female was 1.23:1. The age group between 16-25 years (n=100) was more prone to commit suicide. The suicidal tendency was higher in Illiterates (n=32), and we found similar with graduates (n=32), secondary (n=31) and higher secondary (n=30), Based on occupation both Labour workers (n=49) and home makers (n=49) are committing suicide, followed by Students (n=43), Salaried peoples are the least group (n=4).

Socio-Economic Patterns of Poisoning: The incidents of poisoning was also classified based on social-economical classes in middle (n=139), followed by poor (n=31) and (n=17) are given in Table 3.

Lag Time: The mean time interval was 4.13 hours (range 15 min to 58 hours). Patient from urban areas were brought to hospital earlier than from rural areas (mean 3.25 h vs 11.15 h). Similarly, patient belonging to higher income groups had significantly shorter time lapse. However, there was no difference in time interval between those who survived and those who died.

Glasgow Coma Scale (GCS): The GCS was used to identify the level of consciousness which can be used to interpret the neurological functions of the patient Table 4. Majority of the patients show Mild head injury (n=174), Moderate Head Injury (n=3) and Severe Head Injury (n=10). Out of the 10 Severe Head Injury (n=2) are deceased.

Discussion

The age specific pattern of poisoning in this study is to that of the most developing country most occur in young peoples 16-25 years of age, then falls steadily with increased in age, similar to Churi S et al10 but other studied reported that 20-30 years was higher Kumar, Ganesh, S et al, Chattoraj A et al, Srivastava et al, Aminak et al, Maharani, B et al11-13. The agent used for poisoning is similar to that of the research article published by Churi S et al, Kumar, Ganesh, S et al, Chattoraj A et al, Khan, Pathan Amanulla et al, Aminak et al, Maharani, B et al10-14 who states that pesticides are used more for intentional poisoning, which is followed by drug over dosage, in Srivastava et al study they reported that house hold materials are highly used for suicide. In the group of pesticides organophosphates compounds are used
more, as the availability of pesticides is easy availability through the pesticides shops.

It is estimated that more than 2 million peoples are dying due to poisoning in the world. In most of the condition male are more who commit suicide compared to the women this is been already proved in many studies Churi S et al, Kumar, Ganesh, S et al, Chattoraj A et al, Khan, Pathan Amanulla et al, Amitaet al, Maharani, B et al in our study we reported the same.

In the present Study the married peoples 56.68% are more prone to come suicide compared to unmarried people 41.71% and 1.6 % was divorced, our observation was similar to the study of Churi S et al, Chattoraj A et al and Maharani B et al. This might be due to the family stress and financial problems in the families.

In the population of 187, with occupation of manual labour 27.3% and home makers are 26.2%, which is followed by students 22.99%, similar result was identified from Kumar, Ganesh, S et al and Maharani B et al, there was a different in Kumar, Ganesh, S et al11 and Churi S et al10 study. In this they have concluded that formers commit more suicide which was followed by the students. This difference is due to the study location and the environment.

The present study site is in a rural area, where the study has more rural peoples 70.05% who are prone to commit suicide compared to Urban and semi urban population which was proved with our study and also it is similar with Churi S et al 60.6% and Chattoraj A et al 64%10,12.

We evaluated the literacy level of the patients who commit suicide, we found 49.73% are above secondary school grade. Illiterate was 17.11%, this was supported by the study of Churi S et al and Chattoraj A et al10,12.

In the present study, pesticides 59.36%, drug overdose 17.11%, were most common types of poisoning, the retrospective studies point out the same Poisoning agents which is used as organ of phosphorus was the most used poisoning agent to commit suicide which is proved in majority of the work except Sriniva. Kulfi study has given a result of household 44.1 % drug abuse 18.8 % agricultural poisoning 12.8 %.

When analysing the social economic background of the patient, middle class 75.4% are from this group and other study also have the same results Churi S et al. Followed by rich 14.97% there was a deviation in the study of Churi S et al10, they have concluded that the poor socio-economic background was the second most common group to commit suicide. We evaluated that poor socio-economic background was 9.63% reported according to our study.

We identified by using Glasgow Coma Scale, that patients with mild head injury 93.05% can have a better improvement comparative to moderate head injury 1.6% and Severe head injury 5.35% we have two disease patients the amount of poison which is used is very high and also the lag time was also correlating with this incident.

**Conclusion**

As it was a retrospective study, it was difficult to draw conclusions regarding the role of first aid in acute poisoning. Suicidal tendency wearing on social economic condition and socio demographic pattern which is a growing health problem in developing country the most commonly used poisoning agents are pesticides and medicines which was identified in our study. The most common cause of poisoning was intentional which indicates that by patient counselling and effective medical management is very important. The scary searches GSC has an excellent sensitivity to identify the clinical outcome and which might predict the severity in emergency centre so implementing the use of Jessie scale is highly recommended.

**Ethical Clearance:** Nil

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCES**


A Study on the Capital Expenditure and Operational Costs Incurred to Establish and Run a Proposed Stand alone 30 Bedded Dialysis Center in Hyderabad, India

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1Senior Resident, Dept of Hospital Administration, KIMS, Narketpally; 2Intern, Apollo Institute of Medical Sciences, Hyderabad; 3Junior Resident, Dept of Hospital Administration, NIMS, Hyderabad

ABSTRACT

Dialysis centers attached to hospitals will be unable to meet the growing need of ESRD patients and this need will have to be fulfilled with standalone dialysis units. This study focuses on the capital expenditure and operational costs required to establish and run a stand alone 30 bedded dialysis unit in Hyderabad. The total project cost to establish a 30 bedded standalone dialysis unit would be Rs 2.8 crores. Operational cost per month to run the unit at 50-70% occupancy would be Rs 18.65 lakhs. Fixed costs per month would be Rs 14.6 Lakhs and the variable cost per session of dialysis would be Rs 1011.

Keywords: Dialysis centers, Project cost, Operational cost

Introduction

Dialysis is the artificial replacement for lost kidney function, in the people affected with End Stage Renal Disease (ESRD). It has been known for many years that ESRD is associated with very high mortality. In India the first Hemodialysis facility was established in 1961 at the CMC Vellore; Over the last three decades many more dialysis facilities have been established in Government sector, in Charitable Trust run institutions & by Private Nephrologists. The incidence of end stage renal disease was estimated to be 180 to 200 per million populations. In India, the projected number of deaths due to CKD was around 5.23 million in 2014 and is expected to rise to 7.63 million in 2020. Therefore several thousands of patients have to live on maintenance dialysis in India. Dialysis units attached to hospitals will find it difficult to meet this need and stand alone dialysis units would be the way forward. This study aims to find the costs to be incurred in establishing such units.

Objective

1. Calculating the total cost to be incurred in establishing a 30 bedded dialysis unit.
2. Calculating the fixed costs and variable costs associated with the dialysis unit.
3. Calculating the monthly and annual operational costs required for running the unit.

Methodology

- An observational and comparative study was done where the data pertaining to dialysis was collected and analyzed.
- Various market suppliers of Dialysis equipments were contacted and quotations collected for the required equipment.

Our market is facing changes every day. Many new things develop over time and the whole scenario can alter in only a few seconds. There are some factors that are beyond your control. But, you can control a lot of these things and one among them is costs. Cost accounting provides the detailed cost information that management needs to control current operations and plan for the future. Cost Accounting aims at computing cost of production/service in a scientific manner and facilitate cost control and cost reduction.
Norms for equipment and staffing was done as per guidelines.

Based on the quotations and the equipment requirements, Total cost of the project required to establish the unit has been calculated.

Fixed, Operational and variable costs have been calculated after identifying the consumables required for a session.

**Observations**

**Table 1: Cost of the Project**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Quantity</th>
<th>Individual Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD machines</td>
<td>30</td>
<td>6 L</td>
<td>1.8 C</td>
</tr>
<tr>
<td>RO Plant</td>
<td>2000 lts</td>
<td>15 L</td>
<td>15 L</td>
</tr>
<tr>
<td>Monitors</td>
<td>2</td>
<td>30,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Suction</td>
<td>2</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Autoclave</td>
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<td>30,000</td>
</tr>
<tr>
<td>Fumigation machines</td>
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</tr>
<tr>
<td>Nursing Equipment</td>
<td>-</td>
<td>-</td>
<td>1 L</td>
</tr>
</tbody>
</table>

**Hospital furniture**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Quantity</th>
<th>Individual Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed (semi Fowler)</td>
<td>30</td>
<td>20,000</td>
<td>6 L</td>
</tr>
<tr>
<td>Bed side tables</td>
<td>30</td>
<td>3000</td>
<td>90,000</td>
</tr>
<tr>
<td>Cardiac tables</td>
<td>10</td>
<td>2000</td>
<td>20,000</td>
</tr>
<tr>
<td>Crash Cart</td>
<td>2</td>
<td>7000</td>
<td>14,000</td>
</tr>
<tr>
<td>Instrument trolley</td>
<td>1</td>
<td>12000</td>
<td>12,000</td>
</tr>
<tr>
<td>IV stands</td>
<td>15</td>
<td>1500</td>
<td>22,500</td>
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<tr>
<td>Stretchers</td>
<td>2</td>
<td>15000</td>
<td>30,000</td>
</tr>
<tr>
<td>Wheel chairs</td>
<td>2</td>
<td>6000</td>
<td>12,000</td>
</tr>
</tbody>
</table>

**Electronics**

<table>
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<th>Equipment</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Television</td>
<td>10</td>
<td>15000</td>
<td>1.5 L</td>
</tr>
<tr>
<td>Air Conditioners 2 tons (inverter)</td>
<td>6</td>
<td>35000</td>
<td>2.15 L</td>
</tr>
<tr>
<td>Water heaters</td>
<td>2</td>
<td>6000</td>
<td>12,000</td>
</tr>
<tr>
<td>Drinking water coolers</td>
<td>2</td>
<td>6000</td>
<td>12,000</td>
</tr>
<tr>
<td>Fridge (big)</td>
<td>2</td>
<td>25000</td>
<td>50,000</td>
</tr>
<tr>
<td>Set top boxes</td>
<td>10</td>
<td>2000</td>
<td>20,000</td>
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<tr>
<td>Phone connections</td>
<td>-</td>
<td>-</td>
<td>30,000</td>
</tr>
<tr>
<td>Inverter</td>
<td>-</td>
<td>-</td>
<td>1 L</td>
</tr>
<tr>
<td>Generator</td>
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<td>-</td>
<td>5 L</td>
</tr>
<tr>
<td>Electrical fittings</td>
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</tr>
<tr>
<td>CCTV</td>
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</tr>
<tr>
<td>Biometric</td>
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</table>

**13.5 Lakhs**
Conted…

<table>
<thead>
<tr>
<th>Furniture</th>
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<tr>
<td>Chairs</td>
<td>30</td>
<td>1000</td>
<td>30,000</td>
</tr>
<tr>
<td>Racks</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>Lounge sofas (Waiting Hall)</td>
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<td>-</td>
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</tr>
<tr>
<td>Center tables</td>
<td>-</td>
<td>-</td>
<td>30,000</td>
</tr>
<tr>
<td>Office Tables and Chairs</td>
<td>-</td>
<td>-</td>
<td>1 L</td>
</tr>
<tr>
<td><strong>3.1 Lakhs</strong></td>
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<tr>
<td><strong>Computer Equipment</strong></td>
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</tr>
<tr>
<td>Computers</td>
<td>2</td>
<td>20000</td>
<td>40,000</td>
</tr>
<tr>
<td>Printers</td>
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<td>4000</td>
<td>8,000</td>
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<tr>
<td>Routers</td>
<td>2</td>
<td>2000</td>
<td>4000</td>
</tr>
<tr>
<td>HIMS Software &amp; Server and Accounting software</td>
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<td>-</td>
<td>1 L</td>
</tr>
<tr>
<td><strong>1.5 Lakhs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2 Manifold</td>
<td>2 + 2</td>
<td>1 L</td>
<td>1 L</td>
</tr>
<tr>
<td>O2 lining</td>
<td>-</td>
<td>-</td>
<td>1 L</td>
</tr>
<tr>
<td>O2 ports</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>O2 cylinders</td>
<td>-</td>
<td>-</td>
<td>1 L</td>
</tr>
<tr>
<td>O2 flow meters</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td><strong>4 Lakhs</strong></td>
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<tr>
<td><strong>Civil works (for a bare shell building)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Room Panels, Partitions &amp; Interiors</td>
<td>-</td>
<td>-</td>
<td>10 L</td>
</tr>
<tr>
<td>Toilets</td>
<td>6</td>
<td>-</td>
<td>2 L</td>
</tr>
<tr>
<td><strong>12 Lakhs</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lease</strong></td>
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<td></td>
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<tr>
<td>Rent Deposit</td>
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<td></td>
<td>14 L</td>
</tr>
<tr>
<td>Stamp duty registration</td>
<td></td>
<td></td>
<td>1 L</td>
</tr>
<tr>
<td><strong>15 L</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linen</td>
<td>-</td>
<td>-</td>
<td>1 L</td>
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<tr>
<td>Signage (Internal &amp; External)</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>Staff Uniforms</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>Housekeeping Equipment</td>
<td></td>
<td></td>
<td>50,000</td>
</tr>
<tr>
<td>Fire safety Equipment</td>
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<td>50,000</td>
</tr>
<tr>
<td>Insurance</td>
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<td></td>
<td>50,000</td>
</tr>
<tr>
<td>Stationery</td>
<td></td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>Website</td>
<td></td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>Architect</td>
<td></td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>Working Capital</td>
<td></td>
<td></td>
<td>20 L</td>
</tr>
<tr>
<td>Misc</td>
<td></td>
<td></td>
<td>50,000</td>
</tr>
<tr>
<td><strong>24.75 L</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>2.8 crores</td>
</tr>
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Operational cost per month (at 50-70 % occupancy)

Table 2: Salaries

<table>
<thead>
<tr>
<th>Post</th>
<th>Required no</th>
<th>Individual Salary</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Manager</td>
<td>1</td>
<td>25000</td>
<td>25,000</td>
</tr>
<tr>
<td>Supervisor</td>
<td>1</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Nephrologist</td>
<td>1</td>
<td>1.5 L</td>
<td>1.5 L</td>
</tr>
<tr>
<td>MBBS doctor</td>
<td>1</td>
<td>30000</td>
<td>30,000</td>
</tr>
<tr>
<td>Dialysis Technicians</td>
<td>15</td>
<td>20000 (avg)</td>
<td>3 L</td>
</tr>
<tr>
<td>Nurses</td>
<td>10</td>
<td>12000 (avg)</td>
<td>1.2 L</td>
</tr>
<tr>
<td>Dietician</td>
<td>1</td>
<td>10000</td>
<td>10,000</td>
</tr>
<tr>
<td>Workers</td>
<td>10</td>
<td>8000</td>
<td>80,000</td>
</tr>
<tr>
<td>Clerical staff</td>
<td>3</td>
<td>13500</td>
<td>40,000</td>
</tr>
<tr>
<td>Security</td>
<td>2</td>
<td>10000</td>
<td>20,000</td>
</tr>
<tr>
<td>Marketing</td>
<td>1</td>
<td>20000</td>
<td>20,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>8.1 L</strong></td>
</tr>
</tbody>
</table>

Table 3: Operational Cost

<table>
<thead>
<tr>
<th>Salaries</th>
<th>8.1 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>2.5 L</td>
</tr>
<tr>
<td>Water</td>
<td>2.5 L</td>
</tr>
<tr>
<td>Equipment Maintenance</td>
<td>20,000</td>
</tr>
<tr>
<td>Internet and phone</td>
<td>5,000</td>
</tr>
<tr>
<td>Laundry</td>
<td>10,000</td>
</tr>
<tr>
<td>Building Maintenance</td>
<td>20,000</td>
</tr>
<tr>
<td>Rent</td>
<td>2.5 L</td>
</tr>
<tr>
<td>Loan EMI</td>
<td>2.5 L</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18.65 L</td>
</tr>
</tbody>
</table>

Table 4: Cost Classification for Dialysis

<table>
<thead>
<tr>
<th>Cost item</th>
<th>Cost category</th>
<th>Cost Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialyzer</td>
<td>Direct cost</td>
<td>Variable</td>
</tr>
<tr>
<td>Drugs</td>
<td>Direct cost</td>
<td>Variable</td>
</tr>
<tr>
<td>Consumables</td>
<td>Direct cost</td>
<td>Variable</td>
</tr>
<tr>
<td>Staff salaries</td>
<td>Direct cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Administration</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Electricity</td>
<td>Indirect cost</td>
<td>Variable</td>
</tr>
<tr>
<td>Water</td>
<td>Indirect cost</td>
<td>Variable</td>
</tr>
<tr>
<td>Laundry</td>
<td>Indirect cost</td>
<td>Variable</td>
</tr>
<tr>
<td>Sterilization</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
</tbody>
</table>

Continued...

<table>
<thead>
<tr>
<th>Cost item</th>
<th>Cost category</th>
<th>Cost Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Keeping</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Waste Disposal</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Building rent &amp; maintenance</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Security</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Depreciation</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
<tr>
<td>Interest</td>
<td>Indirect cost</td>
<td>Fixed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item</th>
<th>Price</th>
<th>Req.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dialyser (single use)</td>
<td>530</td>
<td>1</td>
<td>530</td>
</tr>
<tr>
<td>2</td>
<td>Blood tubings</td>
<td>112</td>
<td>1</td>
<td>112</td>
</tr>
<tr>
<td>3</td>
<td>Fistula needle</td>
<td>16</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>4</td>
<td>Acid concentrate-lts</td>
<td>16</td>
<td>4</td>
<td>64</td>
</tr>
<tr>
<td>5</td>
<td>Bicarb powder</td>
<td>25</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Transducer protector</td>
<td>8</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>N .S 1000ml</td>
<td>25</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Sterile glove</td>
<td>11</td>
<td>2</td>
<td>22</td>
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<tr>
<td>9</td>
<td>Unsterile Gloves</td>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>Heparin 25000iu</td>
<td>85</td>
<td>1.65ml</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>10 cc syringe</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>5 cc syringe</td>
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<td>1</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>IV set</td>
<td>17</td>
<td>1</td>
<td>17</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>891</strong></td>
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</tbody>
</table>

Cost of consumables and variable cost for a session of Dialysis

Estimated cost of Electricity per session – 80 Rs
Estimated Cost of water per session – 30 Rs
Estimated cost of Laundry per session – 10 Rs
Total Variable cost per session = 1011

Fixed costs per month
- Salaries – 8.1 L
- Rent and Building Maintenance – 3 L
- Loan EMI – 2.5 L
- Depreciation -1 L
Total – 14,60,000

Discussion

The total project cost required to establish a 30 bedded standalone dialysis unit would be Rs 2.8 crores. Of the above, 1.8 crores is required only for the HD
machines. Nearly 70% of the project cost is being spent on the medical equipment. This would also result in a high depreciation. Operational cost per month to run the unit at 50-70% occupancy would be Rs 18.65 lakhs. For the center to be self sustainable and profitable in the long run, nearly 18 lakhs of revenue should be generated per month. Fixed costs per month would be Rs 14.6 Lakhs and the variable cost per session of dialysis would be Rs 1011. The variable cost helps us in finalizing the tariff of each session.

**Conclusion**

With the rising incidence of ESRD, the requirement of Dialysis centers in India is rising. Dialysis centers attached to hospitals will be unable to meet this need and this need will have to be fulfilled with standalone dialysis units. The total project cost to establish a 30 bedded standalone dialysis unit with the latest HD machines would be Rs 2.8 crores.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not Required

**REFERENCES**

Assessment of Communication Skills of Budding Doctors in a Tertiary Care Centre Puducherry

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¹Asst. Professor, Department of Community Medicine, Aarupadai Veedu Medical College & Hospital, Pondicherry; ²Asst. Professor, Department of Community Medicine, Govt Thiruvarur Medical College & Hospital, Thiruvarur, Tamilnadu; ³MBBS II year student, Aarupadai Veedu Medical College & Hospital, Pondicherry

ABSTRACT

Background: In our country, the doctor-patient relationship has declined immensely and is portrayed as outburst of violence against doctors. Enhancing patient centeredness has been the toughest part of health care as there is no specific medical school curricula that augment their competency in social and communication skills.

Objectives: 1) To assess the self-rating of communication skills of the interns with the patients. 2) To objectively assess the communication skills of interns during their patient interaction. 3) To find if there is any correlation existing within the spectrum of communication skills being observed.

Methods: Forty interns of Aarupadai Veedu Medical College and Hospital, Puducherry were enrolled in August-September 2016. MAAS global rating list and Conversation Skill Rating Scale (CSRS) were used respectively for objective assessment and perception of their inherent patient-interaction skills.

Results: Young doctors rated them as an average conversationalist, socially semi-skilled, moderately competent and also partially appropriate and effective in the way they communicate with the patients (overall average score of 3.6/7). They were slightly above average (score 4/6) in being attentive, physically examining and managing illness in addition to being empathetic, informative to patients, in spite of having inadequate exploratory skills (score 3/6). When a young doctor thinks of being socially skilled, he/she delivers himself/herself as an excellent conversationalist and a competent communicator as evident from significantly positive Spearman's correlation coefficient (P<.05). Doctors who were efficient enough to summarize could endure themselves being better in all the components of a proficient communicator (P<.05).

Conclusion: In order to maximize the significance of inter-personal communication skills among doctors, efforts to imibe the sessions for skills and inter-personal development in the medical curriculum is indispensible to build a healthy doctor-patient relations in future.

Keywords: doctor-patient relationship, communication skills

Introduction

Patient-centeredness in health care system is evolving to be an important approach in effective health care delivery. Effective and competent communication by the physicians to their patients remain one of the core elements of patient-centeredness.¹² Moreover, physician’s skills in communication revealing their overall social competencies, have been identified as one of the six competencies by the Accreditation Council on Graduate Medical Education (ACGME) required for the effective practice of medicine.¹³
Communication in medical school curricula was informally imparted without a specific focus on improving the skills of the budding doctors. This traditional method left gaps in the teaching method that is getting widened with the prevailing circumstances.\[^5\] With the transition from paternalistic approach to individualism, the physicians are facing an extra burden in answering patient’s questions and educating them in pertinent manner.\[^6\] The patient population being diverse among Indians with significant variation in their language, cultural, educational and social background, there has to be vibrant strategy to be adopted by the physicians to tackle them accordingly.\[^7\]

Despite the understanding of this growing issue compiled to scarcity of the studies in Puducherry revealing communication skills of the doctors, the purpose of this study is to assess the same in the budding doctors of our future.

**Objectives**

1. To assess the self-rating of communication skills of the interns with the patients.
2. To objectively assess the communication skills of interns during their patient interaction.
3. To find if there is any correlation existing within the spectrum of communication skills being observed.
4. To suggest measures to improve interpersonal communication of young doctors.

**Materials & Method**

This cross-sectional study was carried out at Out-patient Department & In-patient Department of Aarupadai Veedu Medical College and Hospital, Puducherry. The study was conducted during August-September 2016. Convenient sampling was made and about forty interns were enrolled. We used Conversation Skill Rating Scale (CSRS) for self-rating\[^8\] and MAAS global rating list\[^9\] for doctor patient communication skills for the objective assessment. Statistical analysis were done using SPSS software (Version 22.0, Chicago, USA). Quantitative variables were presented as mean and SD (or median and IQ range). The variables were analyzed using Independent sample t-test and Spearman's correlation coefficient. p-value less than 0.05 was considered to be significant.

The study protocol was approved by the institutional ethics sub-committee following which the study was initiated. Informed verbal consent was taken from the patients before conducting the study.

**Results**

A total of forty interns students were subjected for the 20 interview sessions. The junior doctors rated them as an average conversationalist, socially semi-skilled, moderately competent and are partially appropriate and effective in the way they communicate with the patients. (Table 1)

The individual components of a good doctor -patient communication skills was assessed using MAAS scale. (Table 2) It showed that, all the budding doctors are good at introducing themselves to the patient. They were reasonably good at exploring the reasons they seek the doctors for the prevailing health conditions and in reciprocating their concerns. Only an average score was awarded to the junior doctors in the way they physically examine patients following a proper explanation of the procedure being done. In managing the illness discussing possible alternatives, the male doctors (score 4/6) were better compared to their counterpart (score 3.5/6) and was statistically significant.

They were also partially good in explaining the do’s and don’ts in an understandable language to the patient in addition to summarization and structuring of the diverse phases of appropriate interaction in sequence. Yet, they lack in skills exploring patient’s understanding of the information given and in addition to responding to their non-verbal gestures.

**Table 1: Self Rating of Communication Skills by CSRS Scale (n = 40)**

<table>
<thead>
<tr>
<th>Skills</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>IQ-range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversation</td>
<td>2</td>
<td>5</td>
<td>3.60</td>
<td>.841</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Social Skills</td>
<td>2</td>
<td>5</td>
<td>3.55</td>
<td>.639</td>
<td>4</td>
<td>3-4</td>
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<tr>
<td>Competency</td>
<td>3</td>
<td>5</td>
<td>3.65</td>
<td>.580</td>
<td>4</td>
<td>3-4</td>
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</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Skills</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>IQ-range</th>
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</thead>
<tbody>
<tr>
<td>Introducing</td>
<td>6</td>
<td>6</td>
<td>6.00</td>
<td>.000</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Attentive</td>
<td>3</td>
<td>6</td>
<td>4.00</td>
<td>.816</td>
<td>4</td>
<td>3-5</td>
</tr>
<tr>
<td>Managing</td>
<td>3</td>
<td>5</td>
<td>3.80</td>
<td>.564</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Physically Examining</td>
<td>3</td>
<td>5</td>
<td>3.80</td>
<td>.608</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Exploring</td>
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<td>4</td>
<td>3.48</td>
<td>.506</td>
<td>3</td>
<td>3-4</td>
</tr>
<tr>
<td>Informative</td>
<td>3</td>
<td>6</td>
<td>3.78</td>
<td>.733</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Summarizing</td>
<td>3</td>
<td>5</td>
<td>3.78</td>
<td>.733</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Structuring</td>
<td>3</td>
<td>5</td>
<td>3.70</td>
<td>.648</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Empathetic</td>
<td>3</td>
<td>5</td>
<td>3.65</td>
<td>.580</td>
<td>4</td>
<td>3-4</td>
</tr>
</tbody>
</table>

*a- All these skills are rated from scores 1-7*

Table 2: Objective assessment of communication skills using MAAS scale (n = 40)

<table>
<thead>
<tr>
<th>Skills *</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>IQ-range</th>
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<td>-</td>
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<tr>
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<td>3</td>
<td>6</td>
<td>4.00</td>
<td>.816</td>
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<td>.564</td>
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<td>3-4</td>
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<tr>
<td>Physically Examining</td>
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<td>5</td>
<td>3.80</td>
<td>.608</td>
<td>4</td>
<td>3-4</td>
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<tr>
<td>Exploring</td>
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<td>4</td>
<td>3.48</td>
<td>.506</td>
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<td>3-4</td>
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<tr>
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<td>6</td>
<td>3.78</td>
<td>.733</td>
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<td>3-4</td>
</tr>
<tr>
<td>Summarizing</td>
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<td>5</td>
<td>3.78</td>
<td>.733</td>
<td>4</td>
<td>3-4</td>
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<tr>
<td>Structuring</td>
<td>3</td>
<td>5</td>
<td>3.70</td>
<td>.648</td>
<td>4</td>
<td>3-4</td>
</tr>
<tr>
<td>Empathetic</td>
<td>3</td>
<td>5</td>
<td>3.65</td>
<td>.580</td>
<td>4</td>
<td>3-4</td>
</tr>
</tbody>
</table>

*a- All these skills are rated from scores 0-6*

Table 3: Correlation of self-rated communication skills

<table>
<thead>
<tr>
<th>Skills</th>
<th>Correlation</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversation</td>
<td>Spearman's rho (ρ)</td>
<td>1</td>
<td>.468</td>
<td>.389</td>
<td>.219</td>
<td>-.155</td>
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<tr>
<td></td>
<td>p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.002</td>
</tr>
<tr>
<td>Social Skills</td>
<td>Spearman's rho (ρ)</td>
<td>1</td>
<td>.118</td>
<td>.311</td>
<td>.242</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.469</td>
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<tr>
<td>Competency</td>
<td>Spearman's rho (ρ)</td>
<td>1</td>
<td>.110</td>
<td>.149</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.499</td>
</tr>
<tr>
<td>Appropriateness</td>
<td>Spearman's rho (ρ)</td>
<td>1</td>
<td>.281</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.079</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Spearman's rho (ρ)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Spearman's Correlation Coefficient (ρ) was found;  
A- Conversation, B- Social skills, C- Competency, D- Appropriateness, E- Effectiveness;  
p-value <.05 is significant;

Table 4: Correlation of objectively derived communication skills

<table>
<thead>
<tr>
<th>SKILLS</th>
<th>Correlation</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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</thead>
<tbody>
<tr>
<td>Attentive</td>
<td>Spearman's rho (ρ)</td>
<td>1</td>
<td>.390</td>
<td>.155</td>
<td>.062</td>
<td>.171</td>
<td>.300</td>
<td>.242</td>
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<td>.013</td>
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<tr>
<td>Managing</td>
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<td>-.198</td>
<td>.260</td>
<td>.074</td>
<td>.182</td>
<td>.094</td>
<td></td>
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<tr>
<td></td>
<td>p-value</td>
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<td>.010</td>
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<tr>
<td>Physically Examining</td>
<td>Spearman's rho (ρ)</td>
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<td>.242</td>
<td>.414</td>
<td>.104</td>
<td>.233</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>p-value</td>
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<td></td>
<td></td>
<td>.919</td>
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<td>-.050</td>
<td>-.023</td>
<td>-.031</td>
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<tr>
<td></td>
<td>p-value</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td>.332</td>
</tr>
</tbody>
</table>

Spearman's Correlation Coefficient (ρ) was found;  
A- Conversation, B- Social skills, C- Competency, D- Appropriateness, E- Effectiveness;  
p-value <.05 is significant;
Discussion

The novel of this study is the intra-skills correlations that were observed among the budding doctors. Table 3 shows that, a doctor who feels himself socially skilled is also a good conversationalist ($\rho = .468, P = .002$) and being a competent communicator ($\rho = .389, P = .013$) and vice-versa. In addition, the young doctors adjudicate their appropriateness in their conduct when they tend to over-rate their social ability ($\rho = .311, P = .05$). However, their competencies and effectiveness in communication have not been found to be correlated which might be due to the fact that, he or she might choose not to be competent or be impaired by anxiety or any inner motivation, in spite of possessing adequate understanding and abilities. Fentiman IS et al.,[10] in their study have revealed the importance of barriers of good communication like doctors burden of work, patients anxiety, etc and it is significant for a doctor to get through such barriers to provide a patient centered care.

In table 4, the picture of how one competency go hand in hand with the rest has been clearly depicted. A doctor who is attentive to the complaints betters in managing the patients by providing alternate options and involving in shared decision making ($\rho = .390, P = .01$). A work by Lee RG et al.,[11] have stated that the practitioners need to move beyond the traditional one-way approach with the patients which might not suit in all circumstances and hence shared decision making would remain a possible solution for it. Performing a proper physical examination aids in eminent managerial skills ($\rho = .404, P = .01$) in addition to the delivering of a compendious summary to the patient concerned ($\rho = .414, P = .008$). When they happen to be informative to

<table>
<thead>
<tr>
<th>Competency</th>
<th>Spearman's rho ($\rho$)</th>
<th>p-value</th>
<th>1</th>
<th>.333</th>
<th>.501</th>
<th>.293</th>
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<td>.001</td>
<td>.067</td>
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<tr>
<td>Summarizing</td>
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<tr>
<td>Structuring</td>
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<tr>
<td>Empathetic</td>
<td></td>
<td></td>
<td>1.178</td>
<td>.026</td>
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</table>

Spearman's Correlation Coefficient ($\rho$) was found; A- Attentive, B- Managing, C- Physically examining, D- Exploring, E- Informative, F- Summarizing, G- Structuring, H- Empathetic; p-value <.05 is significant;

In order to hamper the patient dissatisfaction rates and violence against doctors, proficient interpersonal interaction among them holds the key. In this study, it is it is evident that the young and future doctors utterly lack a proper communication technique. Hence there is a paramount need to inculcate the same by means of interactive sessions and training programmes cascaded throughout their curriculum to build a healthy doctor-patient relationship.

Conclusions

In order to hamper the patient dissatisfaction rates and violence against doctors, proficient interpersonal interaction among them holds the key. In this study, it is evident that the young and future doctors utterly lack a proper communication technique. Hence there is a paramount need to inculcate the same by means of interactive sessions and training programmes cascaded throughout their curriculum to build a healthy doctor-patient relationship.

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Source of Funding: No

Ethical Approval: Approved by Institutional Research Committees (IRC)

REFERENCES


Towards the Implementation of IoT for Environmental vStatus Verification in Homes

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ABSTRACT

In this paper, we have revealed a compelling impel-mentation for Internet of Things utilized for checking general household conditions by methods for ease universal detecting sys-tem. The portrayal about the coordinated system design and the interconnecting instruments for the dependable estimation of parameters by savvy sensors and transmission of information through web is being exhibited.

Keywords: Internet of things (IoT), wireless sensor network, home automation, ZigBee, energy management.

Introduction

With the advancements in Internet technologies and Wireless Sensor Networks (WSN), a new trend in the era of ubiquity is being realized. Enormous increase in users of Internet and modifications on the internetworking technologies enable networking of everyday objects [1]. “Internet of Things (IoT)” is all about physical items talking to each other, machine-to-machine communications and person-to-computer communications will be extended to “things” [2], [3]. Key technologies that will drive the future IoT will be related to Smart sensor technologies including WSN, Nanotechnology and Miniaturization.

Humans usually inside their home interact with the environment settings like light, air, etc., and regulate accordingly. If the settings of the environment can be made to respond to human behaviour automatically, then there are several advantages

There are several examples of intelligent home automation or “Smart Home Monitoring” in research labs around the world, such as the GatorTech Smart House [11], Casas Smart Home [12], iDorm [13], Georgia Tech Aware Home [14], Place Lab [15], etc. To date, there has been no complete development of a monitoring smart home of commercial perspective, nor any investigation into how such a house is perceived by either the inhabitants or their careers. The smart homes designed so far are for different purposes such as information collection and decision support system for the wellbeing of the inhabitants [16], [17], storing and retrieving of multimedia data [17] and surveillance, where the data is captured from the environment and processed to obtain information that can help to raise alarms, in order to protect the home and the inhabitants from burglaries, theft and natural disasters [17].

This paper illustrates an effective low-cost and flexible solution for condition monitoring and energy management in home.

System Description

The remote measurement and controlling of domestic devices over the Internet can be mechanized by following certain network architectural design strategies and applying ZigBee communication standards. The unified system will assist the inhabitants to avoid multiple systems to monitor their domestic utilization. The system can be run with the help of an inhabitant favorite laptop or i-pad device. Fig.1 shows the basic layout depicting key elements of the integrated WSN with internet system. It consists of i) Smart Sensing devices, ii) IoT Gateway and iii) Internet Server.

A. ZigBee Wireless Sensor Network: The ZigBee WSN comprises of XBee-S2 modules built by Digi [23] are configured as end devices (sensor nodes) and communicate wirelessly to a coordinator in the form of a mesh topology. If the
end device is within the range of the coordinator device, the system runs like a star topology. Otherwise, hopping takes place and the outer most end device will send its data to the nearby router and consequently the data will reach to the coordinator.

The sensing unit type #3 measures the environmental conditioning values such as temperature, light intensity, humidity, etc.,. Thus, the fabrication of different types of sensing units enabled in remote monitoring and controlling of house-hold appliances through IoT gateway and IoT application. Depicts the fabricated sensing units used in the IoT application.

The power supplies for sensing unit’s type #1 and type #2 are from electrical outlets, whereas for type #3 the power is supplied from a battery. Type #1 and type #2 radio units are continuously on, therefore consume 40 mA. Type #3 radio units’ uses a duty cycling method in which, it is on for 30 ms for every 5 secs, therefore current consumption is 0.24 mAh.

The wireless sensing units with internal sensors to measure temperature, light, humidity, electrical parameters, etc., are deployed at the house. Electrical sensing units are fabricated in such a way that they can be easily plugged into power points and can operate according to their functional characteristics within an indoor range of about 70-80 meters provided an XBee S2 Pro module is used. We considered Xbee-S2 modules in the present setup as they provide sufficient indoor range (i.e. up to 40 meters).

C. IoT Application Gateway: The transformation of sensing information between the ZigBee and IPv6 network is executed by a program at the IoT application gateway, as the ZigBee network does not have the architecture to communicate with internet protocols. The IoT application gateway consists of a program for trans-forming ZigBee addresses and encapsulating data payloads in an internet protocol. The XBee-S2 modules produce sample packets which are converted by
the application gateway to IPv6 User Datagram Protocol (UDP) packets and sent to a server. Command packets to control the XBee-S2 modules are encapsulated in an UDP packet by the server, and converted by the IoT application gateway to ZigBee packets.

D. Sensor Characteristics: The environmental parameters (temperature, humidity and light) are important aspects for deciding whether equipment such as (fans, electric heaters or lamps) should be switched on or off in a wireless monitoring network used for energy management in the home. The following sensors are used in the present setup.

The sensor nodes used in the ZigBee WSN have a temper-ature sensor (TMP 36) [25] operating in the range of −20 °C to +125 °C. The output voltage out of this sensor varies 1 °C for every 10mV with 500mV offset voltage. The light sensor used was BPW21R [26], consists of a planar silicon NPN photodiode that is equipped with a flat glass window and built in colour correction filter designed to approximate the spectral response of the human eye. The power dissipation is about 300 mW with operating temperature range of −40 °C to +125 °C and sensitivity to 9 nA/lx [26]. The AC voltage sensor has a range of 200-280 Volts-RMS with an accuracy of± 2Volts-RMS. The current sensor consisted of an ASM010 current transformer manufactured by Talema [27], with a range of 1 to 100 Amps and operating temperature range from −40 °C to +120 °C.

Implementation Details

A. Address Transformation: The key element in the data transformation from ZigBee to IPV6 format is the address translation. This was implemented by the application gateway program for determining the source or destination address of a packet that encapsulates a ZigBee packets’ payload. The corresponding application gateway performs the address transformation mechanism for ZigBee to address non ZigBee nodes. ZigBee is based upon the 802.14.5 protocol which uses a 64 bit address for each node on a PAN, and 16 bits to identify the PAN ID. IPv6 uses 128 bits to address a node on the network, of which 48 bits represent the network, 16 bits represent the local network (PAN ID), and 64 bits represent the host id (sensor node). Therefore, the node address for 802.15.4 can placed in an IPv6 address, and the PAN ID can be used to identify the ZigBee network in an IPv6 address. The address transformation of ZigBee and IPv6 packet.

B. Packet Translation: The packets originated from the XBee-S2 network are sent to a server using a tunnelling technique, where the addressing information is removed and placed in the encapsulating protocol. Packets destined for the XBee-S2 network use a stateful translation where the source address is stored on the gateway. This enables reply packets from the XBee-S2 network to be sent to the correct address.

A serial interface is used to transmit Application Programming Interface (API) packets from/to the coordinator and router. The WRT54GL router has two serial ports – one of which is used to connect to the XBee-S2 coordinator. The router performs the conversion of the XBee-S2 API packet to an IPv6 packet.

C. Transmission Over IP: The Linux-OpenWRT software provides the networking architecture to participate in many types of networks. These networks are abstracted into devices, which generalizes management and configuration. This abstraction requires device drivers which operate in the kernel space, making development difficult.

The IPv6 can be used with a TUN/TAP driver provided the kernel has IPv6 support. This means a virtual IPv6 network can be created, where packets destined for this network are routed to a user space program. IPv6 packets can also be created and sent via the TUN/TAP driver and will appear to originate from the virtual network.

D. Storage of Data: The UDP packets produced at the gateway encapsulate sample data to be sent to windows based server. An application running on the server uses the standard socket interface to receive UDP packets on an arbitrary port, and stores the relevant information in the MySQL database. The database table has 4 columns; source address, time, source channel and sample data. Rows are added to this table for each UDP packet received.
Experimental Results

The developed system is tested by installing the Smart sensing units and setting up a ZigBee based WSN at few houses. Interconnecting ZigBee network with IPv6 network is performed by connecting and configuring the modified router (IoT application gateway) as discussed in section III. Integrated system was continuously used and generated real-time graphical representation of the sensing information.

Reliability: The reliability of the system was determined by comparing the calculated value with the amount of sensor information received correctly. The lost packets include the total of lost packets between sensing device-coordinator, coordinator-router and router-server. The difference between arrival times of successive sensor information gives the interval value. If the time interval is greater or less than 10 seconds then there was an error. When the interval is less than 10 secs then the sample information received was incorrect or duplicated and therefore it is erroneous.

Throughput: The throughput of the sensing module is the amount of data sent from the sensing module to the server in a given time period [28]. The amount of data in each sample packet was 16 bytes, which is sent every 10 seconds. Therefore the throughput of the sensing module was 1.6 bytes per second. To measure the throughput of the sensing module, the number of packets received in a 5 minute time span was considered. The throughput was obtained by dividing the time interval of 5 minutes. The throughput of a sensing module for the period of one month. The average throughput is 1.55 bytes/second and the reli-ability was 97%. Investigation into the sporadic significant change in throughput is in process.

Discussion and Future Work

With the advancements in technology, it is expected that the availability of internet is everywhere and online at all time. Low-cost smart sensor node development enabled devices to be connected easily and corresponding information can be accessible globally. With the features of scalability, fault tolerance and effective power consumption of nodes and trans-ceiver IoT have facilitated ubiquity computational ability to internetwork heterogeneous smart devices easily and facilitate availability of data anywhere. In this paper, we proposed an efficient method for internetworking of 802.15.4 with IP network.

Conclusion

The longitudinal learning framework could give a discretion instrument to better task of the gadgets in observing stage. The structure of the observing framework depends on a mix of unavoidable conveyed detecting units, data framework for information collection, and thinking and setting mindfulness. Results are empowering as the unwavering quality of detecting data transmission through the proposed coordinated system engineering is 97%. The model was tried to produce ongoing graphical data instead of a proving ground situation.

Ethical Clearance: Taken from IEEE committee

Source of Funding: Self

Conflict of Interest: Nil

REFERENCES


Evaluation of Contamination of Different Regions of Surgeon’s Face During Minor Oral Surgical Procedures

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ABSTRACT

Aim: To determine the high risk region of contamination on a dental surgeon’s face during minor surgical procedures and investigate the relationship between duration of surgery and use of powered instrument on facial contamination by blood splatters.

Materials and Method: This study involved total of 60 minor surgical procedures. The contamination of different regions of the surgeons face was evaluated with the help of a custom made face shield with a sponge. At the end of each procedure the face shield was detached from the surgeon’s face and was subjected for analysis. To determine the incidence of blood and salivary splatters in different zones of the face, four reference boxes of 12cms x 3 cms (Fontal region, Orbital region, Nasal region and Oral region) was determined on checked white A4 sheet (21 cms x 29.7 cms). Each face shield was individually examined by placing the transparent sheet over the white A4 sheet with the reference boxes such that the borders of the face shield and the A4 sheet are approximated and the visible particles on each reference boxes were counted. One way analysis of variance (ANOVA) and chi square tests were used for data analysis.

Results: Results were tabulated with regard to instrumentation, the time factor, the incidence of splatter on different regions of face. Contamination different regions of dental surgeons face was significantly different (P < 0.05). And the contamination increased with increase in duration of the procedure and use of powered tools (P < 0.05).

Conclusion: Among different regions of the face orbital and nasal region have a high chance of getting contaminated.

Keywords: contamination, blood splatter, salivary splatter, face, minor oral surgery.

Introduction

Health care workers especially dental surgeons and dental assistants are more subjected to infectious diseases through aerosol and splatter in routine dental practice ¹, ², ³. For most of the last century, dentists have not used any protective equipment for eye, nose, mouth but the increasing incidence of infectious diseases accentuates the principles of infection control ⁴. The blood and saliva confront an identified risk of this group to pathogens like hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) ⁵. There is a yearly increase of 5.84% in contamination rate of healthcare workers ², ³ 2.5% of HIV infection and 40% of HBV and HCV infections in health care workers is accounted to be through occupational cross infection as stated by world health organization (WHO). Dental surgeons often deal with blood and saliva and also use powered instruments for various procedures. Oral cavity acts as a perfect environment for the survival of various pathogenic organisms. Thus WHO emphasizes the use of personnel protective equipments (PPE) for the safety of dental healthcare workers ⁶. PPE such as gloves, gowns, masks, protective eyewear or face shields and other

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protective barriers and safety devices are meant to prevent exposure to blood-borne pathogens through mucous membrane, intact skin or through parenteral routes. Blood and saliva being potential pathogen carriers are a threat to dental surgeons as they are converted into aerosol or splatter by the use of powered instruments during various procedure. Micik and colleagues defined the terms ‘aerosol’ and ‘splatters’. Aerosol is defined as particles less than 50 micrometer in diameter. Splatter is defined as particles larger than 50 µm in diameter. Micik and colleagues stated that these particles or droplets are ejected forcibly from the operating site and are in a trajectory similar to that of a bullet until they contact a surface or fall to the floor. Studies of Checchi et al demonstrates that the exposed areas of dentists face are at high risk of infection.

This study aims at evaluating contamination of different regions of the dental surgeons face during various minor surgical procedures and determining the high risk region.

**Materials and Method**

This study involved total of 60 minor surgical procedures done under local anesthesia all of which were intra oral procedures. The contamination of different regions of the surgeons face during the surgical procedures was evaluated with the help of a transparent sheet measuring 21 cms x 29.7 cms. The sheet was secured to the fore head of the operating surgeon with a help of an elastic band over a piece of sponge measuring 29.7 cms x 2.5 cms x 2.5 cms placed at upper border of the sheet for comfort of placement, forming a face shield (Figure 1). This face shield was positioned and placed on all the surgeons by the same person. The surgeon performed the surgical procedures with the face shield secured to the face throughout the procedure. All the surgeons who operated were right handed dentists. The type of procedure done, time taken for the completion of the procedure and the site where the procedure is being done and involvement of a powered tool in each procedure were noted. At the end of each procedure the face shield was detached from the surgeon’s face and the sponge was discarded and it was set aside to dry at normal room temperature. Once the sheet has dried completely it was subjected for analysis.

To determine the incidence of blood and salivary splatters in different zones on the face, four reference boxes of 12cms x 3 cms was determined on checked white A4 sheet (21 cms x 29.7 cms). The four boxes were labeled as Fontal region, Orbital region, Nasal region and Oral region. Frontal region (Forehead region) represented area of face from hair line to the upper eye brow. Orbital region (eye region) represented area of face from upper eye brow to lower eyelid. Nasal region (nose region) represented area of face from base of lower eyelid to the base of the nose. Oral region (mouth region) represented area from the philtrum of upper lip to the prominence of chin. Each face shield was individually examined by placing the transparent sheet over the white A4 sheet with the reference boxes such that the borders of the face shield and the A4 sheet are approximated and the visible particles on each reference boxes representing different regions of the face were counted.

**Figure 1: Custom made face shield**

**Result**

With regards to instrumentation: Out of the 60 procedures performed under local anesthesia 100% of the procedures were intra oral procedures. Blood and salivary splatters occurred to the face shield in 42 cases (70%) and 18 cases (30%) were devoid of any splatter on examination. In 40 procedures (67%) powered tool was used. Of these cases 36 cases (90%) produced splatter to the face shield. In 20 surgical procedures (33%) powered tool was not used of which 4 procedures (20%) resulted in splatter to the face shield. This was highly significant (P<0.00001).
With regards to the time factor: Out of the 60 procedures included 19 cases (32%) took less than 15 minutes for completion. Of these cases only 2 cases (10%) resulted in blood splatter to the face shield. 41 procedures lasted more than 15 minutes to get completed of which 40 cases (98%) produced blood splatters to the face shield. This was also significant (p˂0.00001)

With regards to incidence of splatter on different areas of face: Out of the 60 procedures included, Frontal region had splatters in 26.7% (16/60) of the cases; Orbital region had splatters in 63.3% (38/60) of the cases; Nasal Region had splatters in 50% (30/60) of the cases and Oral region had splatters in 36.66% (22/60) of the cases. There was statistically significant difference between the incidences of blood splatters in different regions of the face (p˂0.00001). Blood and salivary splatters were significantly higher in the Orbital region followed by Nasal region when compared with Frontal region and Oral region (Graph 1).

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
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<th>Mean Square</th>
<th>F</th>
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</thead>
<tbody>
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<td>3</td>
<td>82.6931</td>
<td>24.41327</td>
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<tr>
<td>Within groups</td>
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<td>236</td>
<td>3.3872</td>
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<tr>
<td>Total</td>
<td>1047.4625</td>
<td>239</td>
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<td></td>
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</table>

The f-ratio value is 24.41327. The p-value is <.00001. The result is significant at p < .05.

Graph 1: Incidence of splatter in different regions of face during minor oral surgical procedures

Discussion

This study shows that during minor oral surgical procedures there is a high chance of facial contamination with blood and salivary splatters. The rate of contamination increases significantly with the use of powered tools during the procedures. This result can be backed up by the fact that usage of powered tools during intra oral surgical procedures produces an aerosol effect, with blood and salivary particles spraying outwards. Also the contamination increases as the length of the procedure increases more that 15 minutes. Among the different regions of the face, orbital region has the higher incidence of getting contaminated followed by the nasal region when compared to the contamination of frontal and oral region.

Blood and saliva in oral cavity during the minor surgical procedures is a potential carrier of infectious pathogenic microorganisms. These microorganisms gain access the operating surgeon either by direct contact or through splatter. Aerosolization of the blood and saliva during surgical procedures is contributed by the use of high speed rotary instruments and surgical drills.

The splatter that arise from oral cavity due to the use of high speed handpieces and powered surgical drills can
vary in size from 50 micrometer in diameter to several millimeters and it can be projected from the patient’s oral cavity to a distance of 15-120 cms\textsuperscript{17,19}. These splatter or aerosol that escape the operative site can gain access to the operative surgeons respiratory system, skin, nose, eye or mouth or can get deposited in the collar, cloth or on the hair of the surgeon.

A study done by Schnetler JF\textsuperscript{20} shows that there are even higher threat of HIV and Hep B and C viruses being transmitted to the operating surgeon and the dental assistant through contamination of eyes by blood splatter. Also there is a high probability risk of saliva containing other pathogenic bacteria such as Streptococcus pyogenes, Haemophilus influenza, Staphylococcus spp, Pseudomonas spp, Acinetobacter spp, M.tuberculosis and viruses such as Epstein barr virus, cytomegalovirus and herpes virus from infected individuals\textsuperscript{21}. The gingival crevicular fluid also contributes to infecting the saliva with pathogenic organisms\textsuperscript{17}.

The result of this study is agrees with various different studies done previously, which have shown that the blood splatter contamination during various surgical procedures varies from 25\% to 51\%\textsuperscript{22,23,24,25,26,27}. But a study done by Endo S et al\textsuperscript{28} showed that contamination in mask region was higher when compared eye region, which was in contrast to other mentioned studies.

Another study conducted by Nejatidanesh F et al\textsuperscript{29} shows that among the different areas of face eye and nose regions are more prone to contamination with splatter and aerosol during prosthetic and periodontal procedures.

Despite the risk of infection of conjunctiva of the eye resulting from exposure to blood and body fluids the use of face shields among health care workers has been reported to be as low as 4\%\textsuperscript{30}. The upper facial protection is not widely used because of inconvenience\textsuperscript{31}.

Following proper dental ergonomics during every dental surgical procedure and maintaining proper precautionary measures will protect the operating surgeon and the dental assistants from the contamination risks. It is mandatory to use personal protective equipments like head cap, face mask and also a protective eye wear or a visor mask to prevent contamination of eye from splatter of saliva and blood. High power suction devices must be used for surgical procedures utilizing micromotor handpieces and other powered tools. Betadine or chlorhexidine mouth rinse should be given to every patient before the start of each surgical procedure to reduce the bacterial load of the oral cavity\textsuperscript{17,32}.

**Conclusion**

Among different areas of the face both region around eyes and nose have a high chance of getting contaminated when compared to the region of forehead and mouth. Rate of contamination increases with the use of powered tools. Emphasis should be made by the operator to reinforce the use of proper eye protection like eyewear, visor mask or face shield along with other personal protective equipments during all minor oral surgical procedures.

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**Conflict of Interest:** There are no conflicts of interest.

**Ethical Clearance:** Not required

**REFERENCES**


Relationship Between Body Composition, Physical Activity and Functional Capacity

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ABSTRACT

Background: Physical activity level among young adults are grossly reduced due to urbanization and tremendous increase in technology and this has led to increase in changes in body fat composition and functional capacity. Physical inactivity poses various threats to health of an individual. The relationship between body composition, physical activity and functional capacity needs to be understood and studied hence this study was taken up.

Objective: To find the association of body composition with physical activity and functional capacity.

Methodology: An observational study with sample of 150 both men and women of age group between 18-30 years. Anthropometric measurements were taken like Body Mass Index, Waist-Hip ratio, Skin fold, % body fat. Physical activity level was assessed using IPAQ long form and functional capacity was assessed by 6 minutes walk test. Results were analyzed by Regression analysis and Pearson’s correlation method by SPSS software 23.0 version.

Results: In this study we observed about 92% participants were moderately active and 4% were highly active and 4% had low physical activity. The mean 6 minutes distance achieved by male is 645.03 ± 57.498 and female is 566.22 ± 64. There is a significant effect of body composition on functional capacity, the Body Mass Index being the most influential factor.

Conclusion: This study concludes that in college students Body Mass Index was the most influential factor for functional capacity. There is a need to create an awareness about physical activity among college students and need for regular fitness assessment for this group of population.

Keywords: Body composition, body mass index, waist hip ratio, Physical activity, functional capacity, young adults.

Introduction

Globally physical inactivity level has increased one out of five adults are physically inactive.¹ Physically inactive and obesity are the primary risk factors for the primary and secondary cardiovascular diseases, neurological issues like stroke and certain musculoskeletal impairments.

Developing country like India now- a- days facing prevalence of coronary artery disease at a very young age predicting for further worsening of the India’s health status². Awareness regarding physical inactivity has to take place among young population in India.³ Obesity and physically inactivity not only causes physical or pathological health issues but also causes mental and psychological impairments. This social stress factor results even in the poor academic and/or functional abilities of young adults.
Obesity is usually reported in terms of Body Mass Index (BMI) and abdominal obesity in terms of Waist Circumference (WC) and percentage of body fat. Abdominal obesity measured as WC is a better marker of obesity related metabolic risk than BMI among Indians. If a child develops obesity probability chances are more for continuation of obesity in adulthood. Prevention is better than cure.

Physical activity has to be facilitated to prevent obesity and its risk factors. Thus right from young adulthood encouraging young adult to engage in any sport activity or aerobic activity would result in fit and healthy young adults.

Physical activity regulates and maintains lipid profile of our body by improving HDL which has anti oxidant property and reduces the risk of atheroma formation and by reducing LDL which causes oxidative stress which further results in the formation of atheroma in the blood vessels which leads to cardiovascular complications or stroke. Physical activity also has a major role in influence of fitness of bone density in adulthood in understanding bone maturation and in preventing bone related diseases.

People who were physically active have lower mortality rate than people who have sedentary habits. Physical activity reduces metabolic disorders and prevents hormonal dysfunctions. Especially in women it prevents breast and cervix cancers and also prevents colon and gastric cancers in both male and female.

Physical activity have several beneficial effects like improving all general fitness components like cardiac fitness, muscular endurance, and flexibility and strengthening of the major muscle groups & also plays a major role to overcome stress and enhances mental ability which indirectly improves academic performance of the students and work efficiency among young adults.

As young adults sit in classroom for most of the daytime their sedentary state tends to increase. This has an impact on their physical activity which further leads to abnormal body composition and lethargy. Since no such study has been done to find the relationship of WHR, BMI, Body fat%, physical activity, skin fold measurement on functional capacity in young Indian college students this study was taken up.

In this modern era, physical activity level in young adults has greatly reduced due to availability of resources and this increases the likelihood of developing life style related diseases. Hence this study aims at finding out the physical activity level of the college students and the influence of that on their functional capacity.

**Methodology**

**Study Design:** Observational study

**Sampling Design:** Purposive Sampling.

**Sample Size:** 150 calculated by power analysis.

**Subject recruitment:** Ethical committee clearance was obtained from SRI RAMACHANDRA UNIVERSITY ethics committee for student’s proposal. REF: CSP/16/SEP/51/274.

Paramedical collage students from Sri Ramachandra University were recruited as sample with age group of 18-30 years of age both genders, consented subjects were included for the study. People with h/o medical disorders particularly hypothyroidism, pulmonary or cardiovascular diseases, recent illness in last 4 weeks, musculoskeletal injuries or disorders, neurological disease or impaired cognitive function, pregnancy were excluded.

The recruited subjects physical activity level was assessed using International Physical Activity Questionnaire (IPAQ- long form).

Body composition measurements were taken as BMI by weight in kilograms divided by height in centimeter square. And body fat is measured by two methods 1. Bio-electrical impedance body fat analyzer. 2. Skin fold measurement (3 fold measurement for men: chest, abdomen and thigh and for women: triceps, supra-iliac region and thigh) were taken. Waist circumference and hip circumference were measured with measuring tape and ratio was calculated.

Functional capacity was calculated using six-minute walk test. Before and after the test vitals were monitored like pulse rate, respiratory rate, RPE, B.P, Spo2.

**Tool description:** Tools used in this study were Stadiometer and weighing scale, measuring tape, calculator, skin-fold calipers model name-Personal body fat tester, bio-electrical impedance body fat analyzer (Omron model-HBF-306), IPAQ questionnaire, pulse-oxymeter, Borg scale (6-20), sphygmomanometer, two cones, stopwatch.
IPAQ (long form): It’s a self-assessing questionnaire commonly used to assess the physical activity level of all age groups which was validated and reliable in almost seven countries worldwide. It consists of five components of questions including activities related to job-related, transport, house-hold and gardening, recreation and sports, and time spent for sitting within recent 7 days. The activities that has to be assessed are walking, moderate-intensity activities and vigorous intensity activities measured in MET-minute/week.

Six-minute walk test: Six-minute walk test was conducted in around 50 meters corridor by 30 meters as testing area and subjects were subjected to walk from the 30 meters marked cones considering one point as starting point and same point as ending point for one complete lap of 60 meters and another end point is considered as half lap of 30 meters. Subjects were asked to walk as fast as they can uptil their available range to complete the maximal available distance they can within six-minutes time period. Subjects should not allowed to run or jog they were allowed only to walk.

Statistical analysis: In this study the data were collected from 150 subjects. The collected data were analyzed with IBM.SPSS statistics software 23.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean and standard deviation were used for continuous variables. To assess the relationship between the variables Pearson’s Correlation with scatter plot was used. In all the following statistical tools the probability value .05 is considered as significant level.

Results

The influence of variables age, gender, BMI, W:H, skin-fold measurement, % body fat, P.A score on functional capacity was analyzed by regression analysis and by Pearson’s correlation.

Statistical analysis was tabulated and results were shown as follows.

### Table 1: Demographic analysis

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>MALE (N = 60) MEAN (SD)</th>
<th>FEMALE (N = 90) MEAN (SD)</th>
<th>TOTAL (N = 150) MEAN (SD)</th>
</tr>
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<tbody>
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<td>AGE</td>
<td>22.40 (3.24)</td>
<td>21.48 (2.53)</td>
<td>21.85 (2.86)</td>
</tr>
<tr>
<td>HEIGHT</td>
<td>172.45 (6.54)</td>
<td>156.61 (5.30)</td>
<td>162.95 (9.71)</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>69.06 (12.70)</td>
<td>56.63 (10.03)</td>
<td>61.60 (12.70)</td>
</tr>
<tr>
<td>BMI</td>
<td>23.45 (4.14)</td>
<td>23.22 (4.15)</td>
<td>23.31 (4.13)</td>
</tr>
<tr>
<td>W:H</td>
<td>0.84 (.06)</td>
<td>0.80 (.05)</td>
<td>0.82 (.06)</td>
</tr>
<tr>
<td>SKIN FOLD</td>
<td>30.30 (16.14)</td>
<td>36.70 (14.97)</td>
<td>34.14 (15.71)</td>
</tr>
<tr>
<td>BODY FAT %</td>
<td>18.28 (7.11)</td>
<td>28.93 (6.55)</td>
<td>24.67 (8.54)</td>
</tr>
<tr>
<td>P.A.SCORE</td>
<td>1778.45 (59.57)</td>
<td>1413.43 (44.59)</td>
<td>1559.44 (769.29)</td>
</tr>
<tr>
<td>SEDENTARYNESS</td>
<td>60.08 (16.31)</td>
<td>57.36 (17.84)</td>
<td>58.45 ((17.24)</td>
</tr>
<tr>
<td>6 MWD ACHIEVED</td>
<td>645.03 (57.49)</td>
<td>566.22 (64.90)</td>
<td>597.75 (72.97)</td>
</tr>
</tbody>
</table>

### Table 2: Correlation between Physical Activity Score, BMI, Skin-Fold measurement, Body Fat Percentage and 6 MWD Achieved

<table>
<thead>
<tr>
<th>Variable</th>
<th>r- value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.A score and 6 MWD achieved</td>
<td>.262</td>
<td>.001*</td>
</tr>
<tr>
<td>BMI and 6 MWD achieved</td>
<td>-.128</td>
<td>.119</td>
</tr>
<tr>
<td>Skin-fold and 6 MWD achieved</td>
<td>-.346</td>
<td>.000*</td>
</tr>
<tr>
<td>Body fat percentage and 6 MWD achieved</td>
<td>-0.519</td>
<td>.000*</td>
</tr>
</tbody>
</table>
Table 3: Correlation between Body Fat percentage, waist hip ratio, skinfold, BMI and Physical Activity Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>r-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Body Fat and P.A score</td>
<td>-.138</td>
<td>.093</td>
</tr>
<tr>
<td>W:H and P.A score</td>
<td>.158</td>
<td>.54</td>
</tr>
<tr>
<td>Skin-fold and P.A score</td>
<td>.025</td>
<td>.757</td>
</tr>
<tr>
<td>BMI and P.A score</td>
<td>0.75</td>
<td>.360</td>
</tr>
</tbody>
</table>

Table: 4 Regression analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables entered</th>
<th>Variables removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P.A score, BMI, W:H, %Fat</td>
<td>6 MWD achieved</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R square</th>
<th>Std.Error of the Estimate</th>
<th>F</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.612a</td>
<td>.375</td>
<td>58.498</td>
<td>21.724</td>
<td>.000*</td>
</tr>
</tbody>
</table>

Table 5: Correlation Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized coefficients</th>
<th>Standardized coefficients</th>
<th>T</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(constant)</td>
<td>B</td>
<td>Std.Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>615.880</td>
<td>64.185</td>
<td>.371</td>
<td>.000*</td>
</tr>
<tr>
<td>W:H</td>
<td>6.545</td>
<td>1.680</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Fat</td>
<td>-40.656</td>
<td>80.865</td>
<td>-.035</td>
<td>.616</td>
</tr>
<tr>
<td>P.A score</td>
<td>-6.390</td>
<td>.795</td>
<td>-.749</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>.013</td>
<td>.006</td>
<td>.137</td>
<td>.047</td>
</tr>
</tbody>
</table>

The present study shows a weak positive correlation between P.A score and 6 MWD achieved and statistically significant. This shows that as physical activity level increases the functional capacity also increases. There was a very weak negative correlation shown between BMI, skinfold measurement and 6 minutes distance achieved. It is showing that as there is an increase in BMI and skinfold measurement there would be reduction in functional capacity. It shows that if there is an increase in skinfold measurement there will be an reduction in 6 minutes distance achieved and it is statistically significant. There is a moderate negative correlation between % fat and 6 MWD achieved. It shows that if there is an increase in % body fat there will be reduction in 6 minutes achieved. Excessive body fat increases the work load for a given amount of exercise hence this could have led to reduction in 6MWD (Table:2)

There is a very weak negative correlation shown between % fat and P.A score. Increase in body fat percentage reduces the physical activity and it is statistically not significant. There is a very weak positive correlation shown between W:H and P.A score and it is statistically significant. There is a strong positive correlation shown between BMI and P.A score though statistically not significant (Table:3) To predict the functional capacity with variables such as physical activity score, BMI, W:H% and fat percentage the linear regression model was used. The results shows that all the variables has significant effect on 6MWD. Among the variables BMI significantly affects the 6MWD. (Table:5)

Discussion

A recent study found that the number of overweight and obese people globally increased from 857 million in 1980 to 2.1 billion in 2013.\textsuperscript{11} BMI provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and for all ages of adults. In the present study of 150 subjects 53% were overweight based on BMI (Male–mean 23.4, Female–mean 23.2) showed a positive correlation with age.

Skinfold thickness has been used for the assessment of body composition.\textsuperscript{12} In the present study based on skinfold measurements 53% were overfat and on basis of body fat percentage 36% were obese. And it showed negative correlation with functional capacity. The mean
skin fold measurement and body fat percentage were higher in females in the present study.

Waist-to-Hip ratio (WHR) has been suggested as a more accurate assessor of adiposity than the BMI in predicting cardiovascular disease risk. Present study showed normal waist hip ratio in both genders, & showed a weak positive correlation with physical activity and 6MWD.

The 6 MWT is a simple, inexpensive test for the measurement of functional capacity. Obesity increases the workload for a given amount of exercise. The present study show a negative correlation between BMI and 6MWD, this shows that the increased workload due to obesity has reduced the distance walked. The 6 MWD achieved by males were approximately 80 metres more than females. Similar study done by Gosselink R and coworkers on healthy subjects showed 6MWD was greater in males than females.

In the present study BMI and fat percentage were found to be positively correlated and negative correlation between BMI, physical activity score and functional capacity in both genders.

A study done by Anjana et al showed that physical inactivity is increasing tremendously in India with fewer than 10% engaging in recreational physical activity even in the present study it was noted only 4% of the individuals are involved in vigorous physical activity. physical activity and functional capacity showed a weak positive correlation thus physical inactivity would reduce the functional capacity of an individual. In the present study since there was lack of vigorous physical activity the correlation could have been weak. Regression analysis showed that among all variables BMI is the most influential.

Based on the findings of this study, the following recommendations are made:

1. The assessment of fitness and health levels of students should be a permanent feature in the colleges.
2. Education on the need to engage in regular and appropriate levels of physical activity should be given to students at regular intervals so that health risks associated with physical inactivity will be reduced.
3. Increased physical activity emphasized in female students in particular to improve their fitness levels.
4. A multicentric study to be conducted in this student population with large sample size.

Conclusion

The current study concludes that there exists a relationship between body composition and functional capacity in young adults and among the variables BMI is the most influential factor. It was also found that the study population lacks vigorous physical activities and the sedentary behavior were also to be found on higher side.

**Conflict of Interest:** None

**Source of Funding:** Self Funded

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Role of Diet and Lifestyle on Individual Health: A Global Public Health Concern

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ABSTRACT
Diet and Lifestyle disorders have been a major public health threat in the present world. In contrast to the advancement in scientific and technological sphere, the diet and lifestyle of individual has witnessed a drastic anomaly, compromising the requisites of good health. The fast paced society has often provoked unhealthy lifestyle (i.e. smoking, drinking etc) and more often skipping the habits for remaining fit (i.e. physical activity). Simultaneously, there is an increase in uptake of junk food that has led to the global problem of obesity. Sufficiency of sleep and sound mental health can curb the menace to a certain level. The choice of food habits vary between age groups and improper consumption has added to the problem. It is also strongly related to the socio economic status of individual. However, there are several indicators like BMI, skin fold, waist circumference etc. that can aid the process of monitoring individual health in terms of being obese. Several diseases including cardiovascular, metabolic or reproductive are directly or indirectly related to obesity that is influenced by lifestyle and diet. Thus, the present life style and diet is under threat for well being of individual and public health as well.

Keywords: Life style, diet, obesity, diseases, food habit, Obesity Indicators, Physical activity

Introduction
Obesity, a complex health issue has reached epidemic levels and has become major public health concerns. It results from a combination of causes and factors, including individual, behavior and genetics. BMI, waist circumference etc. are promising indicator to obesity. Diet and Lifestyle habits have predominant influence on the obesity. Moreover, food habits, consumption of junk foods and socio-economic status have also influence obesity, to a great extent. This review attempts to elucidate the role of diet and lifestyle on individual health along with public health concerns.

Diet and Life-style: Diet is an individual concept that significantly influences health outcomes despite wide range of variation because of diversity of cultural groups and population. An unhealthy lifestyle is a serious and unnoticed problem. The impacts on unhealthy outcomes like overweight, obesity or some other metabolic disorder are still controversial in children and adolescents. College years are the most crucial in development of healthy and unhealthy habits. This problem is inadvertently present is selected populations especially those staying away from home or even during holiday season. Watching television, usage of mobile and lack of exercise are major lifestyle irregularities that possess effect on diet and subsequently the health of individual. Jobs requiring rotating shifts also influence the health of an individual.

Life style habits: Lifestyle of individual plays an important role in the health especially in terms of health issues related to obesity. Fig 1 demonstrates a list of factors of life-style in human that influences obesity and related disorders.
Physical Activity: Physical activity is strongly related to obesity. Physical inactivity is inversely correlated with the risk of obesity for children and the adolescents. With the advent of time, the daily energy expenditure has declined up to 100 kcal approx because of reduced physical activity. Physical activity also varies with occupation. According to Hill et al., a threshold for physical activity exists above which people are in their 'regulated zone' being able to strike a balance between energy intake and energy expenditure. While, below the threshold, lies the 'unregulated zone' having imbalance leading to obesity. Effect of physical activity on children youth and young adults have been widely studied where the balance between energy intake and energy expenditure plays a crucial role.

Preference of Beverages: Preference of beverage primarily depends on the geographic location and its climatic condition. Table 1 shows a list of preferred beverages and its calorific value. Consumption of sugar sweetened beverages particularly carbohydrates soft drinks may be a key contributor of overweight and obesity. A dietary guideline on selection of beverage for moderate intake of sugar represents the role of beverage in sugar intake and subsequent obesity. Alcohol, which is another world-wide choice of beverage, has a controversial impact of obesity. Though its relation with the enhancement of coronary heart disease is well established, yet several epidemiologic studies relating alcohol consumption to obesity do not agree and suggests that alcohol consumption did not increase the risk of obesity.

Sleep: Sleep is an important modulator of neuroendocrine function and glucose metabolism. The role of sleep duration in the regulation of glucose metabolism, appetite and cardio-metabolic risk is well understood. Despite of relationship, the sleep duration and obesity are associated with numerous factors and may vary with age to a great extent showed the relationship between short sleep duration and weight gain, while the association of long sleep duration and risk of obesity also persists.

Food habits:
Veg vs Non-veg: Vegetarian diets may play a beneficial role in promoting health and preventing obesity. A study has indicated that BMI increases when a wider spectrum of animal products are eaten. Some experimental data suggests that vegetarian diets may carry metabolic advantages for prevention of type 2 diabetes. The lower prevalence of diabetes in vegetarian than semi or non-vegetarians was found while; processed meat consumption was a risk factor for diabetes. Vegetarian diet is however associated with an elevated prevalence of mental disorders.

Junk Food: Junk food has been considered a major source of obesity and associated health problems. This not only increased daily calories, but sugar, saturated fat and sodium intakes as well. More frequent use of fast food like burger and French fries was associated with higher risk of overweight and obesity. The association between fast food consumption and BMI could be due to...
to other specific dietary factors like higher fat intake, greater consumption of sugary drinks, fewer fruits and non-starchy vegetables. There is no association between higher fast food consumption and BMI in adolescents while the relation exists for children 30.

Socio-economic status: Family: Low family income and socioeconomic status were significantly associated with childhood depression through stressful life events, family environment and neighborhood characteristics31. Socio economic status shows a stronger bond with obesity and lack of recreational physical activity in women than in any other subgroup32, 33. The relationship between SES and obesity differs in developed and developing societies34.

Occupation: Individual countries suggest that socio-economic status and weight are positively associated in lower income countries and negatively associated in higher income countries 35. The global epidemic of obesity continues to worsen and the ready availability of cheap energy-dense foods and increasing sedentary lifestyle are considered likely causes. There have also been changes in the types of occupation in which workers are employed - from ‘high activity’ to ‘low activity’ occupations and the work environment that contemporary workers experience within a given occupation may now involve more sedentary times than previously36.

Obesity and its Indicators:

BMI: The BMI was invented by Belgian polymath Adolphe Quetelet in the 1800s, and consequently is sometimes known as the Quetelet index. Body Mass Index (BMI) is a mathematical expression used as an indicator to monitor under nutrition and overweight related to health outcome37 (WHO, 1995) in which weight and height are measured and calculated. According to CDC, it is expressed as weight in kg divided by square of height in meters (kg/m²). The simplicity, noninvasiveness and inexpensive nature have popularized the technique of BMI calculation. However, the method in not beyond question since BMI indicates body fatness rather than the excess body fat 38 or location of fat deposition 39. The universal standard for BMI 40 varies to that of Asians. BMI is utilized as an indicator for several epidemiological studies and its impact on parameters like age 41, location 42, disease 43 have been widely studied.

Waist Circumference: It is a measurement taken around the abdomen at the level of the umbilicus i.e. belly button. The waist measurement follows the gender specific standard exceeding which it increases the risk for weight related health problems. A protruding belly or high waist circumference is the accumulation of fat in visceral and posterior subcutaneous adipose tissue compartments 44. It is also associated with diabetes 45. Apart from food habit, stress hormone cortisol also promotes visceral fat deposition46. Thresholds for waist circumference have been recommended for various populations and its impact on sex, age, ethnicity and disease is stated by the World Health Organization as their recent research findings47. Though Waist circumference has been used as a standalone indicator like BMI in determining obesity, yet waist circumference/height ratio is considered as more applicable48.

Skin Fold: The measurement of skin fold is an old and common method for assessing body fat percentage 49 besides BMI 50. The sum of skinfold thickness is related to total body density51. Apart from efficiency of the measurement method i.e. accuracy of the calipers, age and gender of the individual also affect on this measurement a subsequent interpretation52. Various sites of measurements are used in performing skin fold based experiment as shown in Fig 2. Multiple site based measurement can be relied over a single site measurement of skin fold53.

Blood Pressure: The relationship between obesity and hypertension is well established fact. Blood pressure is an easy and accurate measure of hypertension which is a complex phenomenon, coordinated by several systems of the body. In the cardiovascular system renin-angiotensin system (RAS) plays a major role which is associated with controlling energy balance and metabolic rate thereby influencing obesity 53, 54. Activation of the sympathetic nervous system has been considered to have an important function in the pathogenesis of
obesity-related hypertension. However, age affects the blood pressure to a great extent while height affects considerably less. Therefore, high blood pressure of hypertension emerges as a major risk factor related to obesity and other diseases.

**Blood Glucose Level:** Fasting blood glucose has been related to Fat mass (FM) and percent body fat (PBF) and thus used a biochemical or metabolic indicator to obesity. High blood glucose level is a significant concern for Type 2 diabetes which is associated with BMI. The association is strong for high BMI on having increased risk of type 2 diabetes.

**Role of Age and Gender:** Obesity is an emerging and serious health crisis and threat for public health. The curse of obesity is dependent of age, as one of the factors. However slower metabolism or basal metabolic rate (BMR) is the principle behind the process despite of several other factors being cumulatively involved. Several studies reveal the dynamic relationship of age and sex on obesity.

**Obesity and Mental State:** Weight gain is shown to induced by antipsychotic drugs (AP) under chronic administration.

Depressive symptoms in both genders are prominent in obese patients. The relationship between mood and mental disorder is also governed by social or cultural factors. Building self esteem along with treatment of obesity should be a route of treatment for such cases.

**Disease Associated:** There are several reports of occurrence of diseases that are linked to obesity. However not all of them are directly related, yet correlation between disease and obesity is strong. In many of the cases, obesity acts as an indicator or influences the occurrence of certain diseases as a risk factor. The following Figure 3 shows a few of the diseases that are connected with obesity.

**Fig. 3: Diseases associated with obesity**

**Public health concern:** India is one of the countries burdened with the issue of obesity. The prevalence of obesity has doubled in adults and children and tripled in adolescents over the past 2 decades. Fig 4 shows the burden of obesity across the rural and urban population of India (source: World obesity). A population based strategy based on demographics and the prevailing scenario of that particular region can be of importance to minimize or eradicate the further spread of obesity. Identification and understanding of determinant factors is important in designing public health strategies to combat obesity. Obesity policy action framework has been illustrated by Sacks et al. while, Khan et al has put forward a recommended community strategies and measurements to prevent obesity in the United States. Mexico has also initiated a public health strategy against overweight and obesity as National Agreement for Nutritional Health.

**Conclusions**

There is a popular proverb in English, ‘Health is Wealth’. However, the present fast-paced lifestyle has left almost no time for individual to care for personal health. The diet has altered significantly and homemade cooked foods have replaced junk and ready to eat fast food in meeting the demand for daily life. This alteration of lifestyle and diet has significant effect on individual health. The problem has exceeded from a problem of an individual to a common problem posing global threat on public health. Therefore, adequate knowledge regarding life style and diet can render serious preventive measure before the issue becomes a severe curse.
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Valgus Osteotomy an Effective Option for the Management of Fracture of Neck of Femur in Young and Middle Age Patients: A Prospective Study

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ABSTRACT

Background: The fracture neck of femur in young and middle age patients, is one of challenging and unsolved fracture as management and results are concerned. Prognosis is usually unpredictable owing to usual complications in the form of avascular necrosis and non-union. Neglected fractures further enhance the challenge as the procedures to treat these are technically demanding and have not been given consistently reproducible results.

Material and Method: This study is based upon the management of 27 patients of fracture neck of femur who were treated primarily with valgus intertrochanteric osteotomy and internal fixation with double angled dynamic hip screw at BRD Medical college, Gorakhpur.

Results: Majority of patients were in 31-40 years of age group and sustained fracture as a result of road traffic accident. The union achieved in 26 patients with average time of 4.5 months to unite. Average Harris hip score at final follow up was 90.

Conclusion: valgus osteotomy and internal fixation is an optimal method that removes shearing stress and creates compressive forces at fracture site and enhance the bony healing. However, degenerative arthritis, persistent limping due to decrease in abductor lever arm length remains the limitation of this procedure.

Keywords: valgus, osteotomy, fracture neck femur, young

Introduction

Fracture neck of femur is quite common in old age however, number of young and middle age patients are increasing due to high energy trauma like road traffic accidents, fall from height etc. and contribute significant social and financial burden to the society.1-3 The management of fracture neck of femur remains challenging in middle aged patients with high failure rates and complications. The complications related to these fractures are Avascular Necrosis, Non-union and osteoarthritis.4-6 The results of this entity in middle aged patients is influenced by the displacement type, Degree of posterior comminution, duration of fracture, accuracy of reduction and rigidity of internal fixation. The duration of fracture and non-union have a direct relationship with each other. In developing countries, lack of awareness and poorly organized health system often delay the patient’s arrival to appropriate centre to address the fracture neck of femur. In young patients, with good general condition, reasonable size femoral neck and normal joint space, salvage of femoral head remains the aim of treatment. Various head preservation surgery options for such neglected fracture of neck of femur are osteosynthesis along with fibular graft, muscle pedicle bone graft and osteotomy with or without internal fixation. Valgus osteotomy and internal fixation remains good option for fracture neck of femur in young and middle age patients with no evidence of avascular necrosis.7-9 The main advantage of this procedure is to

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convert shearing forces at fracture site to compressive forces and to compensate for limb length shortening that occurs due to absorption of neck. Valgus osteotomy is also useful in improving the stability of highly unstable fracture of neck of femur with significant posterior comminution or high Powell’s angle. The present study was undertaken to establish the usefulness of valgus osteotomy as primary and effective option for the management of fracture neck of femur in young and middle age patients.

**Material and Method**

This prospective study was carried out by authors at BRD Medical college, Gorakhpur between June 2010 to October 2012. This study comprised of patients with fracture neck of femur in 20 to 60 years of age group. The Informed consent was taken from all patients prior to inclusion into study. The study was authorized by the local ethical committee and was performed in accordance with the ethical standards of the 1964 declaration of Helsinki as revised in 2000. Thirty patients presented to hospital with isolated fracture of neck of femur included, however patients with polytrauma or associated injuries were excluded from the study. three patients didn’t turn up to follow up later in the study so 27 patients were included in study and investigated. Valgus osteotomy was used primarily to treat these fractures and fixed primarily with double angled barrel plate and compression screw, Prebent 4.5 mm Dynamic compression plate and screws were also used in few patients. Careful preoperative templating is performed to determine the angle of wedge and angle of insertion of sliding compression screw. Regional anaesthesia was preferred over general anaesthesia for these patients. The patient laid supine on fracture table that allows excellent fluoroscopic visualization of the proximal femur. Lateral approach was used to expose theses fractures. The fracture was initially transfixed by guide wire and then Richard screw is placed at an angle determined by preoperative planning. The intertrochanteric wedge osteotomy was done after marking the wedge with guide wires under image intensifier. Double angled barrel plate was applied to Richard screw and abduction done to close the wedge and plate secured to shaft of femur with 4.5 mm cortical screws. Closure done over suction drain which was removed on third postoperative day.

The patient started non-weight bearing walk and quadriceps drill exercises on third post op day. The required time to union was documented. Fracture union, femoral head necrosis, arthrosis, and femoral head destruction and limb shortening were considered in follow up. The patients were followed up for a period of one year and Evaluation of patient done in accordance of Harris Hip Score Evaluation system.

**Figure 1:** Vertical fracture line through neck more prone to develop non-union. 95° blade or screw is inserted at an acute angle equal to effective angle of implant–wedge angle. Proximal femoral osteotomy is created and a wedge removed. Valgus created at osteotomy site and secured with plate and screws.

**Figure 2:** Radiograph showing fracture neck of femur with vertical fracture line.

**Figure 3:** Immediate post op radiograph showing valgus osteotomy fixed with double angle DHS. Fracture line has become horizontal.
Figure 4: Eight months post op radiographs showing union of fracture neck of femur with consolidated osteotomy site.

Results

Majority of patients were in the range of 31-40 years age and male to female ratio was 2:1 (18 males and 9 females). Majority of patients sustained fracture neck of femur as a result of significant trauma and most common mode of injury in these cases was road traffic accident and only 25.9% patients sustained fracture as a result of trivial fall. Approximately 93% patients presented after a week post injury to the hospital. The late presentation was due to illiteracy, ignorance and belief in traditional bone setters. Anaemia was the predominant co-morbid condition associated with 50% of patients with fracture of neck of femur consistent with poor general health of patients of eastern UP, followed by cardiac problems and hypertension. About 60% of cases were of transcervical type. Average preoperative shortening was 1.7 cm. The average delay in hospital, in seeking management was 9.6 weeks. In Majority of patients started exercises in bed on second post op day and partial weight bearing started at 6-10 weeks, however full weight bearing started after 14 weeks or radiological union. The average time of union was 4.5 months and one patient had non-union. Two patients had superficial stitch line infection which was controlled with change of antibiotics. Average Harris Hip Score was 64 preop and 90 at last follow up. There was no case of avascular necrosis or implant failure. Statistical analysis was done and P value <0.05 was considered statistically significant.

Discussion

Fracture neck of femur as such and neglected fracture in particular is considerable challenge to orthopaedic surgeon as far as union is concerned. The precarious blood supply, endosteal fracture healing, absence of periosteum around the neck, presence of angiogenic inhibiting factor in the synovial fluid and shearing stress at fracture site always predisposes to non-union and avascular necrosis. Despite improvements in understanding of reduction of fracture, better positioning of implant and better x-ray techniques, non-union results in 10-34% of cases. Early surgical intervention, anatomical reduction and rigid fixation reduces the complication rates however, delayed management reduces the possibility of closed reduction and jeopardise the vascularity leading to avascular necrosis. The various modalities in the management of neglected fracture neck of femur in young patients depends upon vascularity of femoral head and are internal fixation along with fibular or muscle pedicle bone grafting and valgus osteotomy.

The natural head must be preserved as far as possible particularly in young and middle age patients. Muscle pedicle bone grafting procedure is undertaken in patients with avascular head with impending non-union in the absence of segmental collapse requiring open reduction. However, these procedures are technically demanding and have not been given consistently reproducible results. Authors evaluated valgus osteotomy primarily to treat delayed presented and neglected fracture neck of femur. Pauwel first described the biomechanics of repositional osteotomy. Weight bearing forces across a vertically oriented fracture line produce shear stresses at the fracture site that favour the production of fibrous tissue. Valgus intertrochanteric osteotomy reorients the fracture site into a more horizontal position. Axial loading in this situation encourages osteogenesis and fracture union. After osteotomy, it is fixed with either angled blade plate or double angled dynamic hip screw but
blade plate is associated with higher rates of suboptimal position and implant failure while hip screw give more compression at fracture site. In the present study authors have evaluated valgus osteotomy and internal fixation primarily with double angle Dynamic hip screw. The rate of union was 96.3%, which was compatible with studies conducted by Marti et al and other authors.16,17 The average preoperative neck shaft angle improved from $112^\circ$ (82-123°) to $136^\circ$ (118-155°), which is comparable to other studies.18,19 This valgusization has an advantage of reducing shortening of limb length, However, it may also lead to limb lengthening as a result of excessive wedge removal at the time of osteotomy. Functional outcome of patients evaluated by Harris Hip score which was 90 at last follow up and was consistent with similar studies.

Although valgus osteotomy and internal fixation is an effective procedure in neglected fracture neck femur, it’s utility in treating fresh fracture of neck of femur with high grade Powel angle and significant comminution is well established. This procedure is head salvaging procedure and does not require open anatomical reduction of fracture. This technique converts shearing stress at fracture site to compressive one and enhance union. This procedure itself may lead to avascular necrosis, early onset degenerative arthritis and decreased abductor lever arm. However, our study showed satisfying results as far as the union rates and functional results are concerned.

**Conclusion**

Valgus osteotomy should be considered as an effective option for management of fracture neck of femur in young and middle age patients and provides compression of fracture site and high success rate.

**Conflict of Interest:** None

**Source of Funding:** None

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Effect of Caregiver Education on Quality of Life and Burden among Caregivers of Children with Cerebral Palsy: A Quasi Experimental Study

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ABSTRACT

Background: Cerebral palsy is one of the common neurodevelopmental disorders seen in children and is associated with lifelong disability. Caregiver’s health and well-being can be adversely affected because of long term delivery of care. It has been showed that family involved method is the best treatment strategy in needs of children with cerebral palsy.

Aim of the study: To investigate the effect of caregiver education on quality of life and burden among caregivers of children with cerebral palsy.

Methodology: The study used quasi experimental research design. 32 caregivers of children with cerebral palsy were included in the study. Caregiver education has been implemented to the participants. Quality of life and burden has been assessed by using WHOQOL-BREF and caregiver burden scale before and after one month of the caregiver education.

Results: The results showed that there is a positive effect of caregiver education on quality of life and burden among caregivers of children with cerebral palsy. The WHOQOL-BREF shows a statistically significant results across 3 domains; physical, psychological and environmental whereas social component didn’t show any significant change (p value >0.05). Caregiver burden scale also shows statistically significant results (p value <0.05)

Conclusion: The caregiver education programme may be helpful for improving the quality of life and reducing the burden among caregivers of children with cerebral palsy.

Keywords: Neurodevelopmental disorder, caregiver, World Health Organization, quality of life, cerebral palsy, burden, caregiver education.

Introduction

A caregiver is demarcated as a family member who has been living with the patient, and has been closely involved in his or her activities of daily living, health care and community relations for more than a year and at least 6 to 10 hours a day.¹ Caregiver burden is the stress experienced by the person who cares a disabled patient. Caregiver’s health and well-being can be deleteriously affected because of long term delivery of care.²

Cerebral palsy is one of such disorder which requires long term care and it is considered as one of the most common neurodevelopmental disorders in children.¹ Cerebral palsy results from insults to the brain during the developmental period and can cause dysfunction of posture and movement, accompanied by impairment in sensation, perception and cognition.³ The worldwide incidence is about 2 to 2.5 per 1000 live birth. In India the incidence is around 3 cases per 1000 live birth.⁴

Delivering care for a child with cerebral palsy is accompanying with financial burden. Parents were conveyed that for providing basic care needs significant

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amount of money and time. These may include consultation fee, transportation expense, food, cost of tablet and adaptive equipment.\textsuperscript{5}

World Health Organization states quality of life as individual’s insight of their position in life in the perspective of the culture and value systems in which they live and in relation to their aims, hopes, morals and concerns.\textsuperscript{6} Quality of life of siblings and parents in turn affects the well-being of the disabled children and family. Family centred care has shown to be more effective than patient centred care.\textsuperscript{7}

Physical therapy for children with cerebral palsy improves the neuromotor element at the level of body structure and function allowing them to carry out their activities of daily life.\textsuperscript{8} Strategies designed to aid the caregiver help them to become a more skilled and self-reliant provider. These interventions will help to prevent the complications of cerebral palsy. Interventions such as role playing and practice are considered to relief the caregiver burden and aid to understand how to carry the child at home. Addition of an educational program for primary caregivers to rehabilitation develops self- and freedom of movement.\textsuperscript{9}

With the advanced health care, the children with cerebral palsy are living longer and there is also a move from institution to family centred care. So the responsibility of caregiver is also greater than before. Most of the studies were reported a positive effect of family centred rehabilitation on cerebral palsy. Past studies were more on nursing practices.\textsuperscript{9,10} An education programme will need to be designed in physiotherapeutic aspect to provide a clear understanding of the caregiving process, how to take care of the cerebral palsy child at home, exercises that can be delivered at home, and various relaxation techniques for the child.

Most studies on caregiver burden were conducted in western countries. In India only few studies were done on this topic. So this study was designed to help and create awareness and better understanding regarding the quality of life, caregiver burden, and also the care giving process in order to take better care of their child through caregiver education in future. It is therefore suggested that inform the public about various programmes and guidelines that can be employed to help the caregiver, their level of stress and quality of life so that the governmental and non-governmental organisation can provide financial support as well as basic care required by the child. The aim of this study was to investigate the effect of caregiver education on quality of life and burden among caregivers of children with cerebral palsy. So in future the well-being of cerebral palsy children and caregiver can be improve with proper caregiver education.

Materials and Method

Source of Data: Data has been obtained from the caregivers of cerebral palsy children from Samanvayasampanmula Kendra special school at Kapikad (Thokkottu) and department of paediatric physiotherapy in Justice K S Hedge charitable hospital, Mangaluru.

Study Design: Quasi Experimental Study (Pre and post comparison study).

Target Population: Caregivers of children with cerebral palsy

Study Duration: 1 year

Sampling Method: Convenient sampling.

Inclusion criteria

- Caregivers of children with any type of cerebral palsy (1-14 years age group) irrespective of their gender.
- Caregiver who have been providing care for more than 1 year.
- Caregiver who spends at least 6 to 10 hours per day with the Cerebral palsy child.

Exclusion criteria

- Caregivers who are not willing to give consent and participate in the study.
- Caregivers who have more than one child with chronic illness.

Sample Procedure: Approval from scientific committee and Institutional Ethics Committee of Nitte Deemed to be University was obtained prior to the commencement of the study. Before commencing the study consent form were obtained from the participants. Principal investigator was post graduate student of physiotherapy. Face to face interview was conducted with parents...
and collected the socio-demographic details. After that caregiver burden and quality of life has been assessed by using caregiver burden scale\textsuperscript{2} and WHOQOL Scale.\textsuperscript{11} Instructions regarding the scale were explained clearly to the caregiver. Prior to the study both scales were converted to local language.

**Caregiver education programme**: It consists of three phases. In first phase explanation regarding the necessity of caregiving and various caregiving techniques has taught to the parents, which includes relaxation techniques, positioning, feeding position, training of activities of daily living, stretching etc. In second phase demonstration of caregiving has been done on the child for a period of 15 minutes. In the third phase caregiver were asked to practice the learned things. The participants were advised to deliver the same thing to the child at home.

A pamphlet was developed for the caregivers of children with cerebral palsy. It covered details regarding the,

1. Various positioning of the child that can be done at home.
2. Relaxation techniques on the lap and in sitting position.
3. Lifting and carrying techniques.
4. Various activities that can be encouraged in supine, prone, kneeling, sitting and standing position.
5. Stretching of tight muscles of upper and lower limb.
7. Wrong and right positioning for feeding.
8. Ideas for shoe ware and clothing for facilitating to wear and remove it from the body.

The content of the pamphlet was constructed and modified from literature and validated by experts. Follow up was done when the caregiver has come for taking physiotherapy treatment for the child and through telephone once a week. After a month quality of life and burden has been assessed again by using the caregiver burden scale and WHOQOL- BREF.

Statistical analysis was done by paired t test using SPSS 16.0 version. p value <0.05 considered significant. The socio-demographic details were analysed by using frequency and percentage of descriptive statistics. Effects size was calculated by using cohen’s d.

**Results**

A total of 32 caregivers of children with cerebral palsy were included in this study. Out of 32 participants 91% were female and 9 % were male. Mean age of the female participant was 36.00 years with a SD of 6.245 and mean age of the male participant’s was 33.51 years with a SD of 5.30. Since the p value is more than 0.05 suggesting age is homogeneously distributed among male and female participants. Table 1 shows socio-demographic details of the participants.

**Table 1: Socio-demographic details of the caregivers of children with cerebral palsy (n = 32)**

<table>
<thead>
<tr>
<th>Socio Demographic Characteristic’s</th>
<th>Frequency n = 32</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government employer</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>Unemployed</td>
<td>22</td>
<td>68.8</td>
</tr>
<tr>
<td>Private sector</td>
<td>2</td>
<td>6.2</td>
</tr>
<tr>
<td>Semi-skilled worker</td>
<td>7</td>
<td>21.9</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>11</td>
<td>34.4</td>
</tr>
<tr>
<td>Secondary</td>
<td>17</td>
<td>53.1</td>
</tr>
<tr>
<td>Graduation</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>5</td>
<td>15.6</td>
</tr>
<tr>
<td>Middle</td>
<td>9</td>
<td>28.1</td>
</tr>
<tr>
<td>Lower</td>
<td>18</td>
<td>56.2</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>23</td>
<td>71.9</td>
</tr>
<tr>
<td>Urban</td>
<td>9</td>
<td>28.1</td>
</tr>
<tr>
<td>Age of the child (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-8</td>
<td>19</td>
<td>59.3%</td>
</tr>
<tr>
<td>8-14</td>
<td>13</td>
<td>40.6%</td>
</tr>
<tr>
<td>Type of cerebral palsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spastic diplegia</td>
<td>20</td>
<td>62.5</td>
</tr>
<tr>
<td>Spastic quadriplegia</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>Spastic hemiparesis</td>
<td>6</td>
<td>18.8</td>
</tr>
<tr>
<td>Dystonic</td>
<td>2</td>
<td>6.2</td>
</tr>
</tbody>
</table>
Paired t test was used to compare the WHOQOL-BREF before and after the intervention. The results showed that physical, psychological and environment had a significant change (p value < 0.001) whereas social domain (p value < 0.36) did not showed any significant change after the intervention. Pre post-test comparison of caregiver burden scale also showed a statistical significance. The effect size for WHOQOL- BREF shows moderate difference in effect size. Caregiver burden scale shows low to moderate difference in effect size.

Table 2: Comparison of quality of life and burden before and after the intervention (n = 32)

<table>
<thead>
<tr>
<th>WHOQOL-BREF Domains</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>“t”</th>
<th>p value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>13.906</td>
<td>2.041</td>
<td>16.625</td>
<td>2.599</td>
<td>-10.349</td>
</tr>
<tr>
<td>Psychological</td>
<td>13.656</td>
<td>3.075</td>
<td>15.312</td>
<td>3.411</td>
<td>-6.496</td>
</tr>
<tr>
<td>Social relationship</td>
<td>9.781</td>
<td>2.696</td>
<td>10.932</td>
<td>2.692</td>
<td>-0.961</td>
</tr>
<tr>
<td>Environment</td>
<td>13.156</td>
<td>2.287</td>
<td>13.687</td>
<td>2.292</td>
<td>-2.198</td>
</tr>
<tr>
<td>Overall QOL</td>
<td>50.406</td>
<td>5.129</td>
<td>55.656</td>
<td>5.013</td>
<td>-10.014</td>
</tr>
<tr>
<td>Caregiver burden scale</td>
<td>45.312</td>
<td>11.579</td>
<td>41.125</td>
<td>11.686</td>
<td>5.507</td>
</tr>
</tbody>
</table>

(* Indicates significance.)

There is a mean difference of 4.93 on WHOQOL and mean difference of 3.26 on caregiver burden scale for employed participants. A mean difference of 3.6 on WHOQOL and mean difference of 2.07 on caregiver burden scale for unemployed person. Pre and post comparison of quality of life and burden in relation to the educational level of participants revealed that there difference of 2.04 on WHOQOL and mean difference of 3.61 on caregiver burden scale for primary level educated participants. A mean difference of 2.90 on WHOQOL and mean difference of 2.36 on caregiver burden scale for secondary level educated participants. A mean difference of 4.15 on WHOQOL and mean difference of 4.1 on caregiver burden scale for graduated participants.

Pre and post comparison of quality of life and burden in relation to the socio-economic level of the participants showed that there is a mean difference of 1.78 on WHOQOL and mean difference of 2.12 on caregiver burden scale for participants of lower class socio economic level. A mean difference of 2.1 on WHOQOL and mean difference of 3.65 on caregiver burden scale for participants of middle class socio economic level. A mean difference of 3.23 on WHOQOL and mean difference of 4.84 on caregiver burden scale for participants of upper class socio economic level.

Discussion

The purpose of the present study was to investigate the effect of caregiver education on quality of life and burden among caregivers of children with cerebral palsy. It was a quasi experimental research design, compared the dependent variables before and after the intervention and there is no control group. Findings of the present study indicated that there was a statistical significance in quality of life and caregiver burden among the caregivers of children with cerebral palsy after caregiver education.

The study reports a similar findings of a study done by Carol Singago et al (2015) that the mother of a children with cerebral palsy are experiencing more burden compared to father and in 90% of the cases mother is the primary caregiver providing an endless care to the child. In this study 91% of participants were mother of cerebral palsy child and experiencing burden and poor quality of life.

Eliza Cristina Macedo et al (2015) conducted a study on burden and quality of mothers of children and adolescence with chronic diseases and found that the physical and mental health of the mothers is adversely affected. Another study conducted by Lucia paris et al to investigate the impact of cerebral palsy on child’s as well as family’s quality of life. Results showed that cerebral palsy had more effect on mothers quality of life compared to fathers.

The study also showed a significant change in caregiver burden after caregiver education. Compared to unemployed participants employed participants showed more difference in mean on WHOQOL-BREF and...
caregiver burden scale, which indicated that occupation plays a role in quality of life and burden among the participants.

Level of education of the participants also showed a difference in mean value on WHOQOL-BREF and CBS. Participants of higher educational level (graduate) showed a better quality of life and less burden compared others. The participants of different socio economic level also showed a relationship with quality of life and burden. Participants of upper class family showed a reduced burden for caregiving and an improved quality of life. Thus it is stated that the socio demographic variables like education, occupation and economic status were related to the quality of life and caregiver burden.

In this study individual oriented education was implemented to the caregivers of children with cerebral palsy. Yeowell reported a similar finding that individual oriented intervention was more beneficial for improving the quality of life compared to group sessions. According to the data bases searched it is the first study which provides a caregiver education programme in a physiotherapy perspective. Past studies were on nursing practices. The caregiver education can help to provide adequate knowledge and self practicing skills related to the condition, so that better care can be delivered at home. Descriptive longitudinal studies can be done on the same topic, so that it will help to evaluate the effectiveness over a long period of time. Limitations of the present study findings were there was no control group and the severity of burden depends on the type of cerebral palsy. In this study all types of cerebral palsy were included.

Conclusion

The caregiver education programme was found to improve the quality of life and reduce the burden among caregivers of children with cerebral palsy. Health care professionals can include the active participation of caregivers in the rehabilitation program so that better treatment can be delivered

Conflict of Interest: Nil

Ethical Clearance: Obtained from scientific committee and Institutional Ethics Committee of Nitte (Deemed to be University), Mangaluru.

Source of Funding: Self funding

REFERENCES


A Study to Assess Fear Perceived by Children Undergoing Painful Invasive Intravenous Procedures

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ABSTRACT

Introduction: Pain can be physiological but also includes spiritual, emotional and psychosocial dimension. The child may associate a great deal of anxiety and fear with pain. In the health care setting medical procedures that are applied using a needle, such as venipuncture and immunization are the most common and important sources of pain for children, causing anxiety, distress and fear. Atraumatic care focuses on reducing the negative impact of such procedures.

Statement of Problem: A descriptive study to assess the fear perceived by children prior to Painful Invasive intravenous procedures.

Objectives: To determine fear perceived by children prior to Painful Invasive intravenous procedures and to determine the association between selected variables and fear.

Method: A descriptive study was done to determine fear perceived by children prior to Painful Invasive intravenous procedures among 48 children. The subjects were selected by purposive sampling technique. The level of fear was assessed using Children’s fear scale.

Findings: Maximum children 97.9% had some level of fear whereas only 2.08% verbalized that they have no fear or procedure. Correlation coefficient between Fear of invasive procedures and selected demographic variables like age, Gender, Birth order, previous experience of painful procedure and presence of caregiver were calculated Fisher Exact test showed significant association between fear and birth order.

Keywords: Children, Fear, Pain, Invasive procedures, Intravenous Cannulation

Introduction

A child’s pain is one of the most compelling as well as most perplexing clinical situation for parents as well as health professionals (Lynda Dalhquist).¹ Children of all ages, including newborn experiences pain. The nurse is often unable to prevent pain but can do much to reduce the physical discomfort. The expression of pain is influenced by the child’s culture and parents’ child-rearing practice. The child may associate a great deal of anxiety and fear with pain and may perceive that pain is punishment for some misdeed.² Pain is physiological but also includes spiritual, emotional and psychosocial dimensions. The goal of pain management in any age or condition throughout the lifecycle is same to focus all the dimensions and to provide maximum pain relief with minimal side effect.

‘Medical fear’ is defined as “any experience that involves medical personnel or procedures involved in the process of evaluating or modifying health status in traditional health care settings (Steward and Steward)”³ In the health care setting medical procedures that are applied using a needle, such as venous access and immunization are the most common and important
sources of pain for children, causing anxiety, distress and fear (Blount 2009, Uman et al 2006). During placement of needle experience of pain is common and this painful experience is a source of fear leading to distress behavior. Pain-related fear is associated with high levels of disability, depressive symptoms, and school impairment. Human being is programmed to encounter fear, and in most cases, fear is adaptive. Pain an unconditioned noxious stimulus which triggers our fear response and alerts our flight-or-fight system to respond. Unfortunately, after only a few repetitions conditioning happens to pain-related fear happens and then it generalizes. These experiences are continued through pain anticipation and leads to operant process of reinforcement. This further causes increased fear and distress even more pain during future invasive procedures. Thus Pain management is the key responsibility of all pediatric health professionals.

The resulting pain due to medical procedures may be considered “mild” by some individuals; however, for many, these needle procedures are far from pricking pain at a local site and are associated with a high degree of pain and fear. Children in particular, are concerned about needle pain. The fear of needles prior to medical procedures like injections and vaccinations is so severe that they experience extreme emotional distress also want to stay away from any medical procedure in future. Pain is a most ubiquitous problem both in children and adults. It is a predominantly subjective emotional distress that also leads to impairment in the quality of life (Katz, 2002). Moreover, fear of pain experienced due to medical procedures in childhood usually continues up to adulthood.

An individual may have risk factors and protective factors influencing the pathway by which the severe needle fear would develop. These factors can predispose, precipitate, perpetuate, or protect against the development of pathologic fear.

There are many Predisposing factors like genetic factors, past life events, or temperament of child, which increases fear during such procedures. Developmental age, Birth order, and presence of care giver may alter the level of fear. Studies show that human being is biologically prepared to be scared of needles because of pain and fear of injury. Female tend to be more afraid and younger age have been shown to be significantly related to needle fear and phobia.

Pain caused by needles may disappear in short time but it may lead to long-lasting emotional effect and fear which may further lead to psychological problems avoidance of medical care or delay in treatment. ‘Trypanophobia’ is extreme fear of medical procedures involving needle. During childhood though these procedures may be very essential thus the health care worker must ensure that they adopt interventions to prevent negative effect like fear.

Effective management of pain is the fundamental right of a person and foremost responsibility of a nurse. International Network On Health Promoting Hospitals And Health Care Services (2010) defines the right of the child as “Children have the right not to feel Pain” Prevention or alteration of negative memories is a crucial part of breaking the negative feedback loop that can cause greater anxiety and pain during future procedures (Cohen 2008, Rocha 2009).

As Invasive intravenous procedures are most common type of painful procedures and the associated fear is a common phenomenon thus the investigator felt the need to assess the fear perceived by children prior to Painful Invasive intravenous procedures.

**Statement of Problem:** A descriptive study to assess the fear perceived by children prior to Painful Invasive intravenous procedures.

**Objectives**

The objectives of the study were to:

1. To determine fear perceived by children prior to Painful Invasive intravenous procedures.
2. To determine the association between selected variables and fear perceived by children during Invasive intravenous procedures.

**Research Hypothesis:** H1-There will be significant association between Fear and selected variables among children at 0.05 level of significance.

**Delimitation:** The study will be delimit to:

- Children admitted in paediatric wards of selected hospital of Mumbai.
- Children aged between 3 to 12 years of age.
- Children undergoing invasive intravenous procedure.
Child’s fear of procedure will be measured only prior to procedure.

Materials and Method

A descriptive study was done to determine fear perceived by children prior to Painful Invasive intravenous procedures among 48 children in a selected hospital after obtaining prior administrative and ethical permission. The subjects were selected by purposive sampling technique. After initial introduction consent and assent were obtained from parents and children. Then fear was assessed using children’s fear scale.

Sample criteria

Inclusion criteria: Inclusion criteria for sampling referred to the children,
- Within the age of 3 -12 years.
- Admitted to paediatric ward undergoing intravenous procedures.
- Willing to participate in the study.

Exclusion criteria: Exclusion criteria for sampling referred to children,
- Who are critically ill.
- Those who are unable to verbalize.
- Children with skin abrasions or any type of skin lesions at procedure site.

Data collection tools: The baseline data was assessed using a questionnaire. Child’s perceived fear was assessed using Children fear scale (McMurtry, C.M., Noel, M., Chambers, C.T., McGrath, P.J. (2011)). Investigator obtained permission to use the tool

The Children’s Fear Scale was adapted from the Faces Anxiety Scale (McKinley, Coote, & Stein-Parbury, 2003) to measure fear in children undergoing painful medical procedures. The initial validation study (McMurty, Noel, Chambers, & McGrath, 2011) with children undergoing venipuncture demonstrated construct validity as well as test-retest and interrater reliability. This scale has 5 faces are showing different amounts of being scared. The left most face shows least scared and the right most face shows maximum fear .The child pointed out the face corresponding their level of fear and it was recorded by the investigator.

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-6 year</td>
<td>20</td>
<td>41.67</td>
</tr>
<tr>
<td>6-12 year</td>
<td>28</td>
<td>58.33</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>79.1</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
<td>20.8</td>
</tr>
<tr>
<td>Birth Order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Youngest</td>
<td>13</td>
<td>27.08</td>
</tr>
<tr>
<td>Middle</td>
<td>5</td>
<td>10.42</td>
</tr>
<tr>
<td>Eldest</td>
<td>13</td>
<td>27.08</td>
</tr>
<tr>
<td>Only Child</td>
<td>17</td>
<td>35.42</td>
</tr>
<tr>
<td>Previous experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>79.1</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>20.8</td>
</tr>
<tr>
<td>Presence of Caregiver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>23</td>
<td>47.9</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>52.08</td>
</tr>
</tbody>
</table>

The study findings (Table-1) revealed that 41.67% children were preschoolers compared to 58.33 School-agers. 79.1% were boys whereas 20.8 were girls. 13 children (27.08 %) among 48 were youngest as compared to 10.42% Middle 27.08 % Eldest and 35.42 % were only child for their parents. Most of the children (79.1%) had history of previous invasive intravenous procedure. Along with 47.9 % children their parents accompanied during procedure whereas for 52.08% parents were not present.
Figure 1. Shows that maximum children i.e.31.25% experienced Bit more fear whereas 27.08% and 22.9% had Little bit fear and much more fear16.7% children perceive extreme fear and only 2.08 % children verbalized that they had No fear or procedure.

Correlation coefficient between Fear of invasive procedures and selected demographic variables like age, Gender, Birth order, previous experience of painful procedure and presence of caregiver were calculated using Kendal’s Tau. There was weak Negligible positive correlation between Pain and age(.077), Weak Positive correlation between Pain and Birth order(0.365), Pain and presence of caregiver(0.224) and weak Negative association between Pain and Gender, Pain and previous experience.

7.92 % of children had some degree of fear of painful procedure .Most of the youngest children in the family had little bit fear (41.15 %) followed by 38.5% with extreme fear of procedure. 41.2 % of children who were the only child had extreme fear. Fisher Exact test showed significant association between fear and birth order at (P> .05)

The study findings were similar to (Martin et. al. 2007) who found that children with higher levels of anxiety had a higher fear of pain and it was associated increased pain. The findings suggested that anxiety sensitivity and fear of pain may play important and distinct roles pain and pain-related disability in children

**Conclusion**

The gate control theory of pain clearly depicts that emotion factor like fear shapes the pain experience as well as future pain adaptation. This study also shows that almost all children exposed to painful procedures have fear. Moreover fear has bidirectional relationship like more pain experience may lead to high level of fear and vice versa. Although acute pain from needles typically dissipates in the minutes, hours, or days after a needle, the emotional sequela of unmanaged pain, most notably a fear of needles, can have a much longer lasting impact. Though these procedures may be very essential measures should be adopted to reduce the negative effect like fear. Health care personnel should plan interventions which will reduce pain as well as fear and distress before during and after the procedure.

**Ethical Clearance:** Obtained from Institutional Scientific and Ethics Board.

**Source of Funding:** Self

**Conflict of Interest:** None

**REFERENCES**


Prediction and Identification of Cancer and Normal Genes Through Wavelet Transform Technique

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ABSTRACT

Currently, in the field of bioinformatics the most important advanced practice of genome signal processing is used to analyze the biological sequences without involving any biological testing or treatments. To analyze the genome data with the help of signal processing concepts the technique of genome signal processing is being adopted. According to the earlier medical research reports, it was understood that the deadly disease of cancer is origin due to genetic abnormality. Some of the signal processing concepts such as Fourier transform, short term Fourier transform, wavelet transform, etc are used for analyzing the biological sequences. Wavelet transform is an important tool for analyzing the cancer genome. The main objective of this research article is to develop the necessary algorithm and to test for several databases available at National Center for Biotechnology Information. In this research the analysis was carried out by using MatlabR2015b for simulations which supports Bioinformatics toolbox. From the results it was found that, the coefficient of variation for cancer genes are always much higher than the normal genes.

Keywords: Detection, Cancer and Normal Genes, Genome Signal Processing, Deoxy Ribo Nucleic Acid, Bioinformatics, Wavelet Transform

Introduction

In the past decades, the disease of cancer is very difficult to identify and cure. Based on the medical research reports, due to cancer cells mortality rate has been significantly increased. After many research inventions in the medical field, the cancer disease has been diagnosed and treated. The major restrictions in the treatment or prediction of cancer disease with the use of biological concepts are high cost and more time consumption [1]. Genome Signal Processing (GSP) technology is the application of Digital Signal Processing Concepts (DSPC) for analyzing genomic sequences [2], [3]. Cancer disease is mainly caused due to environmental agents, chemical exploitation, mutation in the Deoxy Ribo Nucleic Acid (DNA) sequences, etc [4]. DNA is a double stranded molecule found in the chromosomes of the human cell and its major function is to provide instructions for synthesis of the human cell [5]. During the reproduction, DNA makes up chromosomes which are responsible for transferring the genetic information or instructions from parent cell to offspring. Mutation is the sudden alteration in the DNA sequences during cell division which can cause cancer disease [6], [7]. In an earlier research, the various types of mutations occur in DNA sequences such as substitution, insertion or deletion, copy number of alterations and translocations were explained [8].

It is not possible to analyze the DNA sequences as such in the character form of A, T, G, C. It is mandatory to convert the character form of DNA sequences into numerical form. Various numbers of mapping techniques are available for conversion of DNA sequences [9], [10]. The various types of numerical representations were clearly discussed with its merits and demerits in an earlier research. Among the various types of numerical representation techniques, Electron Ion Interaction Potential (EIIP) technique of average

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energy of delocalized electrons of nucleotide has more advantages compared to other methods [11], [12]. EIIIP contains more biological information without much loss and it enhances the discrimination capability and exhibits physicochemical property. The conventional way of Voss representation increases computational complexity since the results of mapping sequences contains four sequences [13]. EIIIP reduces computational overhead by about 75% and it is well known that the exon region reflects period-3- behaviour whereas intron region does not reflect. Hence, it is mandatory to identify the protein coding region in the analysis of genomic sequences [14]-[16]. To analyse the genomic sequences, signal processing concepts are well suited and also among many DSP concepts wavelet transform have been mostly used due to many benefits such as high accuracy resolution, independent of window length, time frequency domain representation, local feature identification, and multi-resolution scalability [17]-[19]. An alternative way to achieve higher accuracy of gene identification was described in an earlier research and the results shows that the wavelet approach is feasible and better than other methods of signal processing [20].

In this article section I describe the introduction which includes about Genome signal processing, DNA, Literature survey of some research papers, section II explain the objective and proposed methodology which describes the steps and procedure have to be followed in the proposed method, section III shows the algorithm and flowchart which involves the flow of the proposed method, section IV describes the results and simulations which clearly shows the discrimination of normal and cancer cells using MatlabR2015b and section V reveals the final conclusion.

Proposed Methodology

The main objective of this research is to develop the necessary algorithm and to test for several databases available at National Center for Biotechnology Information (NCBI) by wavelet transform technique and MatlabR2015b. The various proposed methods were discussed as follows.

Data Collection: The initial process of this research is to extract the DNA sequences. There are so many ways to collect the databases. There are many websites are available for collecting the DNA sequences such as Pubmed, Uniprot, NCBI, etc whereas in this research article, NCBI website was used for collecting the DNA sequences.

EIIIP Technique: The symbolic DNA sequences are converted into numerical sequences using EIIIP representation technique. By applying EIIIP values to each nucleotide, the conversion is to be carried out and the observed EIIIP values for each nucleotide are 0.1260 for A, 0.0806 for G, 0.1335 for T and 0.1340 for C nucleotide respectively.

Wavelet Transform Technique: Wavelet transform is an important mathematical analysis tool in analyzing biological sequences. In this article, wavelet transform is applied for normal and mutated numeric sequences hence, the mutated regions should be predicted which is different from normal sequences.

Power Spectral Analysis: The Power Spectral Density (PSD) graph should be plotted for both normal and the cancer cells. The discrimination between the normal and the cancer cells has to be determined by observing the spikes in the plot of genomic normal and the cancer sequences.

Parameter Evaluation: The mean amplitude, standard deviation, mean normalized frequency, coefficient of variation are the parameters calculated here for both normal and the cancer sequences. By estimating the ratio for those parameters, the differentiation between the normal and the cancer cells should be predicted.

Methodology and Algorithm: The various processes in the proposed methodology are existing data base collection, numerical mapping, analysis with wavelet transform technique, power spectral analysis and evaluation of the parameters with results.

The algorithm for the proposed methodology described as following.

Step 1: Primarily, the databases of normal and the cancer cells required for analysis have to be collected from open access NCBI website.

Step 2: The extracted DNA sequences are converted into numerical sequences using the representation technique called EIIIP.

Step 3: The wavelet technique is applied to the normal and manually mutated numeric sequences. The classification between the normal and mutated sequences has been identified and point out in the wavelet plot.

Step 4: The cancer sequences are also collected and converted into numeric sequences. The wavelet transform is applied to those sequences as same as done in step 2 and 3.
Step 5: Then, the power spectral density has to be computed for normal and the cancer sequences and observe the difference by the presence or absence of spikes.

Step 6: In another way of identifying the differentiation between the normal and the cancer cells, the parameters such as mean amplitude, standard deviation, mean normalized frequency and the coefficient of variation has been computed.

Simulation and Results

The required simulations and results have been developed using MatlabR2015b which supports Bioinformatics toolbox. The results have been taken by doing two methods such as the identification of mutation region and the analysis of both normal and the cancer cells. The normal and the cancer cells with its respective accession numbers were collected from NCBI and are shown in Table 1.

Table 1: Normal and Cancer Cells with its Accession Numbers

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Cell Types</th>
<th>Accession Numbers</th>
<th>Gene Name</th>
<th>Relative Position</th>
<th>Length of Exon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Normal Cells</td>
<td>AF186613.1</td>
<td>HBB</td>
<td>987:1172</td>
<td>186</td>
</tr>
<tr>
<td>2.</td>
<td>Normal Cells</td>
<td>AF186608</td>
<td>HBB</td>
<td>989:1175</td>
<td>186</td>
</tr>
<tr>
<td>3.</td>
<td>Normal Cells</td>
<td>AF083883</td>
<td>HBB</td>
<td>1237:1425</td>
<td>189</td>
</tr>
<tr>
<td>4.</td>
<td>Normal Cells</td>
<td>AF186607.1</td>
<td>HBB</td>
<td>988:1173</td>
<td>186</td>
</tr>
<tr>
<td>5.</td>
<td>Normal Cells</td>
<td>AF186611</td>
<td>HBB</td>
<td>987:1172</td>
<td>186</td>
</tr>
<tr>
<td>6.</td>
<td>Normal Cells</td>
<td>AF348448</td>
<td>HBB</td>
<td>139:324</td>
<td>186</td>
</tr>
<tr>
<td>7.</td>
<td>Normal Cells</td>
<td>AF007546</td>
<td>HBB</td>
<td>1186:1372</td>
<td>186</td>
</tr>
<tr>
<td>8.</td>
<td>Normal Cells</td>
<td>AF186614</td>
<td>HBB</td>
<td>988:1173</td>
<td>186</td>
</tr>
<tr>
<td>1.</td>
<td>Cancer Cells</td>
<td>NM_025225.2</td>
<td>PNPLA3</td>
<td>174:1619</td>
<td>1446</td>
</tr>
<tr>
<td>2.</td>
<td>Cancer Cells</td>
<td>NM_000142.4</td>
<td>FGFR3</td>
<td>257:2677</td>
<td>2421</td>
</tr>
<tr>
<td>3.</td>
<td>Cancer Cells</td>
<td>NM_007294.3</td>
<td>BRCA1</td>
<td>233:5824</td>
<td>5592</td>
</tr>
<tr>
<td>4.</td>
<td>Cancer Cells</td>
<td>NM_000595</td>
<td>LTA</td>
<td>162:781</td>
<td>620</td>
</tr>
<tr>
<td>5.</td>
<td>Cancer Cells</td>
<td>NM_004103.4</td>
<td>PTK2B</td>
<td>254:3283</td>
<td>3030</td>
</tr>
<tr>
<td>6.</td>
<td>Cancer Cells</td>
<td>EE178466</td>
<td>TP53</td>
<td>26:271</td>
<td>246</td>
</tr>
<tr>
<td>7.</td>
<td>Cancer Cells</td>
<td>NM_004333.4</td>
<td>BRAF</td>
<td>62:2362</td>
<td>2301</td>
</tr>
<tr>
<td>8.</td>
<td>Cancer Cells</td>
<td>AF284036</td>
<td>KLF6</td>
<td>4346:5238</td>
<td>892</td>
</tr>
</tbody>
</table>

Method 1: The first method involves the identification of mutation region. The normal sequences of DNA have been collected and converted into numerical representation by using EIIP mapping technique. The EIIP values were plotted for the DNA sequences {…AATCTGAGCCAGTGAAGA….} to find out the maximum values. The X-axis represents nucleotide indices (A, T, C, G) and the Y-axis represents EIIP values (0.1260, 0.1335, 0.1340 and 0.0806). Manually mutate some base pairs of DNA sequences and then conversion technique EIIP was applied for accession number AF186608 and accession number AF083883 before mutation are shown in Figure 1.
Now the wavelet transform was applied to the numeric sequences of both normal and mutated cells. In the wavelet plot of the mutated cells, the mutation region has been clearly indicated in red colour oval box for accession number AF1866608 and accession number AF083883 after mutation are shown in Figure 2. This method is very much useful for identifying the mutation spots in the normal sequences by applying wavelet transform. Wavelet transform plays a major role in observing the mutation region which occurs in the DNA sequences cause cancer.

**Figure 2: Wavelet Transform Plot for Mutated Cell**

**Method II:** In the previous method, the analysis was carried out only in the normal sequences. It is well known that mutation in DNA sequences can cause cancer and hence, the mutation region which causes cancer has been identified in the first method. The second method involves the analysis of both normal and the cancer cells for which, the cancer DNA sequences also collected in addition to the normal sequences. As same as in the previous method, the EIIP mapping technique and the wavelet transform also performed for both the normal and the cancer cells. Here, the power spectral density has been computed and in the PSD plot of cancer cells the spikes are present. The spikes are absent in the normal cells. By this observation, it is easy to predict the normal and the cancer cells. The power spectral plots for normal sequences for the accession numbers AF1866608, AF083883, AF186614 and AF348448 are shown in Figure 3. Similarly, the power spectral plots for cancer sequences for the accession numbers NM_007294.3, AF284036, EE178466 and NM_000142.4 are shown in Figure 4.

**Figure 3: Plot of Power Spectrum for Normal Cell**
The parameters like mean amplitude, standard deviation, mean normalized frequency and the coefficient of variation have been evaluated. The following are the inferences have been taken from those parameters of normal and the cancer cells.

- The ratio between mean amplitude to the standard deviation is more than 1 for normal cells and less than one for cancer cells.
- The coefficient of variation is more than 100% for cancer cells and less than 100% for normal cells.
- The ratio between mean amplitude to the mean normalized frequency is less than 1 for cancer cells and more than 1 for normal cells.

The different parameters with its evaluated values for cancer and normal cells with the ratio of mean amplitude to standard deviation, mean amplitude to mean normalized frequency and coefficient of variation are given in Table 2.

### Table 2: Results of Different Parameters for Cancer and Normal Cells

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Cell Type</th>
<th>Accession Numbers</th>
<th>Mean Amplitude (X)</th>
<th>Standard Deviation (Y)</th>
<th>Ratio (X/Y)</th>
<th>Mean Normalised Frequency (Z)</th>
<th>Ratio (X/Z)</th>
<th>Coefficient of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cancer Cells</td>
<td>AF186608</td>
<td>0.0426</td>
<td>0.0237</td>
<td>1.7975</td>
<td>0.0381</td>
<td>1.1181</td>
<td>55.6338</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>AF083883</td>
<td>0.0381</td>
<td>0.0135</td>
<td>2.8222</td>
<td>0.0296</td>
<td>1.2872</td>
<td>35.4331</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>AF186614</td>
<td>0.0781</td>
<td>0.0682</td>
<td>1.1452</td>
<td>0.0592</td>
<td>1.3193</td>
<td>87.3239</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>AF348448</td>
<td>0.0874</td>
<td>0.0733</td>
<td>1.1924</td>
<td>0.0628</td>
<td>1.3917</td>
<td>83.8673</td>
</tr>
<tr>
<td>1</td>
<td>Normal Cells</td>
<td>NM_007294.3</td>
<td>0.5377</td>
<td>0.6319</td>
<td>0.8509</td>
<td>0.7547</td>
<td>0.7125</td>
<td>117.5191</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>AF284036</td>
<td>0.2873</td>
<td>0.4961</td>
<td>0.5791</td>
<td>0.3575</td>
<td>0.8036</td>
<td>172.6766</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>EE178466</td>
<td>0.7358</td>
<td>0.976</td>
<td>0.7539</td>
<td>0.8422</td>
<td>0.8737</td>
<td>132.6447</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>NM_000142.4</td>
<td>0.0391</td>
<td>0.0482</td>
<td>0.8112</td>
<td>0.0574</td>
<td>0.6812</td>
<td>123.2737</td>
</tr>
</tbody>
</table>
Conclusion

The objective of prediction and identification of cancerous genes was carried out by using wavelet transform technique which is one of the most advanced signal processing concept. An efficient algorithm has been developed for analyzing normal and cancer cells and identification of cancer genes. The ratio of mean amplitude to standard deviation, ratio of mean amplitude to mean normalized frequency and coefficient of variation for cancer and normal cells was found. From the results it was found that, the values of cancer genes mean amplitude to standard deviation and values of mean amplitude to mean normalized frequency are higher than normal genes. Whereas the coefficient of variation results for different cancer genes are lower than the normal genes. For further research the wavelet transform technique has become great scope for analyzing biological sequences in cancer genome.

Ethical Clearance: Taken from the advisory committee of Raja Rajeswari Medical College and Hospital, Bangalore, India

Source of Funding: Self

Conflict of Interest: Nil

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Awareness Regarding Human Papilloma Virus Vaccination among Medical Undergraduates: A Study from Coastal South India

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ABSTRACT

Introduction: Cervical cancer is one of the commonly occurring cancers among women. More than ninety percent of mortality related cervical cancer are reported from middle and low-income countries.

Objectives: To assess the knowledge regarding cervical cancer and HPV vaccination among medical undergraduates in Mangalore.

Materials and Method: This cross sectional study was conducted among medical undergraduates studying at Kasturba Medical College, Mangalore. A pre tested semi structured questionnaire was used for collection of the data. Approval from Institutional Ethics Committee of Kasturba Medical College, Mangalore was obtained before commencement of the study. Data was entered and analysed using SPSS ver. 11.5.

Results: The study involved 154 (40.3%) males and 228 (59.7%) female students. It was found that that aetiology for cervical cancer was known among 347 (90.8%) and 326 (85.3%) knew about correct mode of transmission. Awareness regarding ideal age for HPV vaccination was observed in 45.5% (n=174) of the participants.

Conclusion: The present study showed that awareness regarding cervical cancer was good, but the knowledge regarding HPV vaccination was sub optimal among medical undergraduates.

Keywords: Human Papilloma Virus, Medical Undergraduates, Mangalore

Introduction

Cervical cancer is one of the most common cancers among females. Around five lakh cases were reported in the year 2018 and constitutes just more than five percent of female cancers globally. More than ninety percent of mortality related cervical cancer are reported from middle and low income countries. [1] Around 1.3 lakh newly diagnosed cervical cancer cases and around 75,000 mortalities are reported from India every year which constitutes around 33% of cervical cancer death globally. Human Papilloma Virus 16 and 18 are responsible for more than two third of cervical cancer cases. These are also the most reported genotypes responsible for cervical cancer cases in India. [2]

As mass scale regular screening is tough to achieve in developing nations like India, vaccination can be considered as the best strategy for prevention of cervical cancer. [2]

The chances of detection of abnormal smear while performing PAP smear screening is 35%, but if screening is not performed on a routine basis such women can have 4% life time risk of having cervical cancer. [3] As mass scale regular screening is tough to achieve in developing nations like India, vaccination can be considered as the best strategy for prevention of cervical cancer. [2]

Currently two recombinant DNA vaccines i.e. Gardasil™ and Cervarix™ are available in the market. Gardasil™ provides protection against genital warts and cervical cancer, whereas Cervarix™ provides protection against cervical cancer and dysplasia.
Three doses of HPV vaccination is recommended for females aged 11-12 years as per the recommendation of Advisory Committee on Immunization Practices. The vaccination can begin as early as 9 years to 13 to 26 years. In India mass vaccination against HPV is not feasible due to its high cost.

As medical undergraduates are considered to be future doctors of the society, their knowledge regarding Cervical cancer screening and vaccination is vital in guiding patients regarding HPV vaccination, considering the huge burden of cervical cancer in India. Hence, the present study was conducted to assess the knowledge regarding cervical cancer and HPV vaccination among medical undergraduates in Mangalore.

**Materials and Method**

This descriptive cross sectional study was done among medical undergraduates studying at Kasturba Medical College, Mangalore. A sample size of 400 was calculated considering a power of 80%, precision (relative) of 10% & confidence level of 95% based on the study where the awareness regarding appropriate age for HPV vaccination was 49%. Convenience sampling was used for selection of study subjects. The study was done over a period of 4 months and a pre tested semi structured questionnaire was used for collection of the data. The questionnaire consisted of questions related to knowledge about cervical cancer, HPV vaccination and cervical cancer screening. Participants who refused to give the written informed consent were excluded from the study. Approval for ethical consideration was received from Ethics Committee of Kasturba Medical College, Mangalore. Necessary approval was also obtained from the head of the institution to distribute the questionnaire to medical undergraduates. Data was entered and analysed using SPSS ver. 11.5 and presented in the form of proportions.

**Findings**

**Table 1: Distribution of study participants based on awareness regarding Cervical Cancer (n = 382)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical cancer is preventable</td>
<td>Yes</td>
<td>302</td>
<td>79.0</td>
</tr>
<tr>
<td>Cervical cancer aetiology</td>
<td>Virus</td>
<td>347</td>
<td>90.8</td>
</tr>
<tr>
<td>Mode of Transmission</td>
<td>Sexual contact</td>
<td>326</td>
<td>85.3</td>
</tr>
<tr>
<td>Correct screening technique for cervical cancer</td>
<td>Pap smear</td>
<td>287</td>
<td>75.1</td>
</tr>
</tbody>
</table>

The study involved 154 (40.3%) males and 228 (59.7%) female students. Table 1 depicts the awareness regarding cervical cancer among medical undergraduates. It was found that that aetiology for cervical cancer was known among 347 (90.8%) and 326 (85.3%) knew about correct mode of transmission.

**Table 2: Distribution of study participants based on awareness regarding HPV vaccine (n = 382)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical cancer vaccine is available</td>
<td>Yes</td>
<td>347</td>
<td>90.8</td>
</tr>
<tr>
<td>Ideal group for vaccination</td>
<td>9-13 years</td>
<td>174</td>
<td>45.5</td>
</tr>
<tr>
<td>HPV vaccine can be given to boys</td>
<td>Yes</td>
<td>164</td>
<td>42.9</td>
</tr>
<tr>
<td>HPV vaccine is most effective</td>
<td>Before the onset of sexual activity</td>
<td>145</td>
<td>38.0</td>
</tr>
<tr>
<td>Number of doses of vaccine to be given</td>
<td>Two</td>
<td>224</td>
<td>58.6</td>
</tr>
</tbody>
</table>

Awareness regarding ideal age for HPV vaccination was observed in 45.5% (n=174) of the participants and 42.9% (n=164) of the students knew that HPV vaccine can be given to boys as shown in table 2.

On analysing the reasons for not receiving the vaccine, 38% (n=146) of the medical students were under the opine that cost of the vaccine is the main hindrance followed by lack of awareness towards HPV vaccine (n=132, 34.5%). Around 80.1% (n=306) felt that HPV vaccine must be added to national immunization schedule.
Discussion

The burden of cervical cancer is very high in India and it is one of the top cause of mortality in women. The present study has been done to assess the knowledge regarding cervical cancer and HPV vaccine among future doctors.

In contrast to our study findings where 91% of them knew that virus was the aetiology for cervical cancer, in a study conducted at Thirupathi [7] all the participants of the study were aware of the aetiology. Whereas a study done at Manipal [8] and Mangalore [9] has shown findings similar to our study. A findings similar to our study was observed in a study conducted at Manipal and Mangalore [8,9] where more than three fourth of the students were aware that cervical cancer is preventable. However 95% of the students from Thirupathi [7] were aware of the same. In contrast to study done among medical undergraduates at Thirupathi [7] and Kerala [10] where more than three fourth of the study participants were aware that cervical cancer is transmitted through sexual route, a study done among female in general population at Delhi [11] it was observed to be only one third. Less than half of participants in our study were aware that HPV vaccine can be administered to males similar to studies done at Southern part of India. [7,9] However awareness was very low regarding this in a study conducted at Mehta et al [6] and Deeksha Pandey et al [8].

On analysing the results for correct age for HPV vaccination, a finding similar to our study was observed in a study done by Mehta et al [6] whereas it was more than three fourth in a study done at Mangalore. [9] It is evident from our study that nearly two third of the medical undergraduates were aware that two doses of HPV vaccines to be given, whereas it was only 29% for two doses and 60.6% for three doses in a study conducted at Thirupathi [7] However in a study done at coastal part of South India three fourth of the participants knew that three doses of HPV vaccine is required [9]. High cost was cited as a major hindrance for HPV vaccination in the present study, in congruence to a study done at Andhra Pradesh [7]. However social stigma was cited as a major hindrance for HPV vaccination by general female population of Delhi. [11]

Conclusion

The present study showed that awareness regarding cervical cancer was good, but the knowledge regarding HPV vaccination was sub optimal among medical undergraduates. It emphasis the need to incorporate these aspects in their medical undergraduate curriculum.

Source of Funding: Nil

Conflict of Interest: None to declare

Ethical Clearance: Taken from Institutional Ethics Committee of KMC, Mangalore

REFERENCES


Comparison of the Effects of Various Irrigants on Apically Extruded Debris after Biomechanical Preparation with Four Different Rotary Endodontic Files: An in Vitro Study

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ABSTRACT

Aims: The purpose of this in vitro study was to assess the amount of apically extruded debris during the root canal preparation using different rotary instrumentation systems and different irrigants.

Materials and Method: In this study, 80 human mandibular first premolars were randomly assigned to 4 groups (n = 20 teeth/group). Each group was then divided into four subgroups. In each group, the root canals were instrumented according to the manufacturer’s instructions using the Protaper, Mtwo, K3 and full-sequence rotary Hyflex CM instruments. The canals of sub groups of each group were irrigated with four different irrigants: sodium hypochlorite, chlorhexidine and normal saline. Preweighed eppendorf tubes were used to collect the debris that extruded apically which was assessed with an electronic balance and compared.

Results: Protaper demonstrated maximum extrusion, while hyflex demonstrated least extrusion compared to other experimental groups and 5% Sodium Hypochlorite in each group demonstrated maximum extrusion, while Normal saline in each group demonstrated least extrusion.

Conclusions: Under the conditions of this study, it can be concluded that all systems extruded debris beyond the apical foramen.

Keywords: Apically extruded debris, ProTaper, Mtwo, K3, Hyflex, Irrigants.

Introduction

The main objective of endodontic therapy is to clean the root canal system. During root canal preparation, irrigants, dentin chips, pulp tissue, and microorganisms may be extruded into the periradicular tissues, and these extruded materials may cause postoperative pain and complications.1 Many studies examining the apicalextrusion of debris have stated that all instrumentation techniques and instruments are associated with the extrusion of debris.2-6

Sodium hypochlorite (NaOCl) is the most popular irrigant, and it is used at different concentrations ranging from 0.5%–6%. It is used because of its good tissue-dissolving ability and good antibacterial action.3,4 Chlorhexidine (CHX) is another irrigant that has the ability to kill various microorganisms, but it has no ability to dissolve pulp tissue.5,6

Earlier studies have evaluated the amount of AED by various instruments or techniques but none of them have investigated the effect of various types or concentrations of irrigants on AED. Therefore, the aim of the present study was to compare the amount of apically extruded debris after the preparation of the root canals in extracted human teeth using different rotary files systems and irrigants.

Materials and Method

A total of 80 freshly extracted human permanent mandibular premolars with a single root and a single
The inclusion criteria were one root canal with one apical foramen, root curvature between 0°-10° (by using the method of Schneider), no root caries, root canal calcifications and open apices. The collected teeth were washed under tap water to remove blood stains and soft tissue remnants. The external root surfaces of experimental teeth were cleaned of adherent remnants and debris with periodontal curette and were stored in physiological saline solution.

To have similar tooth lengths, all teeth were measured, and the crowns were ground with a high-speed bur under copious water spray until equal lengths of 14 mm were achieved. Access cavity was then prepared on each tooth, with a round bur (size ¼). The working length of each tooth was determined by inserting a size 15 K file (Mani, Tochigi, Japan). Eighty samples were assigned to 4 groups of 20 samples each on the basis of instrument used for canal preparation. Further each group was divided into 4 subgroups of 5 teeth each. In every group, subgroups were instrumented with same rotary file but with different root canal irrigants.

**Group 1 (P):** Singleinstrument (Rotary Protaper) was used for instrumentation. Further the group was divided in to 4 subgroups based on the 4 different irrigants used

- **a. Sub group 1:** (5 samples)
  5% Sodium hypochlorite as root canal irrigant
- **b. Sub group 2:** (5 samples)
  2.5% Sodium hypochlorite as root canal irrigant
- **c. Sub group 3:** (5 samples)
  2% Chlorhexidine as root canal irrigant
- **d. Sub group 4:** (5 samples)
  Normal saline as root canal irrigant

**Group 2(M):** Rotary Mtwo was used for instrumentation. Further the group was divided in to 4 subgroups based on the 4 different irrigants used

- **a. Sub group 1:** (5 samples)
  5% Sodium hypochlorite as root canal irrigant
- **b. Sub group 2:** (5 samples)
  2.5% Sodium hypochlorite as root canal irrigant
- **c. Sub group 3:** (5 samples)
  2% Chlorhexidine as root canal irrigant
- **d. Sub group 4:** (5 samples)
  Normal saline as root canal irrigant

**Group 3(K):** Rotary K3 was used for instrumentation. Further the group was divided in to 4 subgroups based on the 4 different irrigants used

- **a. Sub group 1:** (5 samples)
  5% Sodium hypochlorite as root canal irrigant
- **b. Sub group 2:** (5 samples)
  2.5% Sodium hypochlorite as root canal irrigant
- **c. Sub group 3:** (5 samples)
  2% Chlorhexidine as root canal irrigant
- **d. Sub group 4:** (5 samples)
  Normal saline as root canal irrigant

**Group 4(H):** Rotary Hyflex was used for instrumentation. Further the group was divided in to 4 subgroups based on the 4 different irrigants used

- **a. Sub group 1:** (5 samples)
  5% Sodium hypochlorite as root canal irrigant
- **b. Sub group 2:** (5 samples)
  2.5% Sodium hypochlorite as root canal irrigant
- **c. Sub group 3:** (5 samples)
  2% Chlorhexidine as root canal irrigant
- **d. Sub group 4:** (5 samples)
  Normal saline as root canal irrigant

One Eppendorf tube for each tooth was pre-weighed prior to canal instrumentation with a 0.0001 electronic weighing machine (Sartorius Cubis, Gottingen, Germany), 3 consecutive measurements were done, and the mean measurement for each tube was considered to be its weight. If these 3 consecutive measurements showed very different numbers, the process of weighing was continued until 3 similar measurements were obtained that only differed in the last digit by 1–2.

Debris and irrigant extruded through the apical foramen was collected in an eppendorf tube. This preweighed eppendorf tube was placed into a larger glass vial. This second bottle was used to hold the device during instrumentation so that no contact to the collecting vial was possible. A 27-gauge needle was inserted into each Eppendorf tube cover to balance the air pressure between the inside and outside of the tube during the insertion. The instrumentation was done by a single operator.

In each of these 4 test groups, 20 canals were enlarged. One set of instruments was used to prepare 4
All root canal preparations were completed by a single operator. The root canals of the four groups were instrumented with rotary Protaper, Mtwo rotary, K3 and Hyflex instruments. The files were used with X-Smart endomotor (Tulsa dental, DENTSPLY Switzerland) as per manufacturer’s instructions. Last apical file of tip size 30 was used in all the groups. The preparation sequence wereas follows:

1. **Group 1**: ProTaper instruments were used according to the manufacturer’s instructions using a gentle in-and-out motion. The instrumentation sequence was SX at two thirds of the WL; S1 and S2 at WL -1 mm; and then F1 (20.07), F2 (25.08), and F3 (30.09), at the WL. Once the instrument had negotiated to the end of the canal and had rotated freely, it was removed.

2. **Group 2**: All Mtwo instruments were used to the full length of the canals according to the manufacturer’s instructions using a gentle in-and-out motion. The instrumentation sequence was 10.04, 15.05, 20.06, 25.06, and 30.05.

3. **Group 3**: Canals were prepared with 0.10 taper K-3 instrument to the resistance followed by 0.08 taper instruments. Then, were further prepared with #40 K-3 instruments to the resistance from largest instrument to smallest reaching the working length. After middle third scouting with #10 K-files; #35 and s#30 K-3 instruments were used in crown down fashion till the working length was reached.

4. **Group 4**: The hyflex instruments were used in a gentle in-and-out motion with a rotational speed of 500 rpm and 250-g/cm torque. The instrumentation sequence was 25.08 (two thirds of the working length), 20.04, 25.04, 20.06 and 30.04 (full working length).

The extruded debris and the irrigant were collected in a preweighed tube. Once instrumentation had been completed, each tooth was separated from the eppendorf tube, and the debris adhering to the root surface was collected from the root surface by washing the root with 1 mL of distilled water into the tube. The receptor tubes were then stored in an incubator at 70° C for 5 days in order to evaporate the moisture before weighing the dry debris.

An electronic balance (Sartorius Cubis, Gottingen, Germany) with an accuracy of 0.0001g was used to weigh the tubes containing the debris. The dry weight of extruded debris was calculated by subtracting the weight of the empty tube from the weight of the tube containing debris. The amount of extruded debris and comparison of mean AED between different groups was done using Analysis of Variance and Tukey’s post-hoc test. The level of significance was fixed at p<0.05.

**Results**

All samples of Group 1 (protaper) demonstrated maximum extrusion, while Group 4 (hyflex) demonstrated least extrusion compared to other experimental groups (Graph 1) and 5% Sodium hypochlorite in each group demonstrated maximum extrusion, while normal saline in each group demonstrated least extrusion (Graph 2-5).

The mean AED obtained after preparation with protaperwas 0.1215 g, with Mtwo was 0.0903 g, with K3 was 0.0292 g, and with hyflex was 0.0202. There was no statistically significant difference between K3 and Hyflex (P > .05). There was no significant differences in the mean AED with Protaper and Mtwo (p>0.05). Mean AED obtained with protaper was significantly higher than that with K3 and Hyflex (p<0.05). Mean AED obtained with MTWO was significantly higher than that with K3 and Hyflex (p<0.05). There was no significant difference in the mean AED obtained with K3 and Hyflex (p>0.05) (Table 1).

In Group 1 (Protaper), the mean AED with 5% NaOCl was 0.2600 g with a standard deviation of 0.0540, with 2.5% NaOCl was 0.1837 g with a standard deviation of 0.0295, with 2% chlorohexidine was 0.0286 g with a standard deviation of 0.0130, and with normal saline was 0.0137 g with a standard deviation of 0.0041 (Table 3).

The comparison of mean AED obtained with various irrigants in Group 1 (Protaper), Group 2 (Mtwo) and Group 3 (K3) showed statistically significant differences. In all these groups, mean AED with 5% NaOCl was significantly higher than 2.5% NaOCl, 2% CHX and normal saline. Mean AED with 2.5% NaOCl was significantly higher than 2% CHX and normal saline. There were no significant differences between mean AED obtained with 2% CHX and normal saline (Table 4-8). The comparison of mean AED obtained with various irrigants in Group 4 (Hyflex), showed statistically significant differences. Mean AED with
5% NaOCl was significantly higher than 2.5% NaOCl, 2% CHX and normal saline. There was no significant difference between mean AED obtained with 2.5% NaOCl when compared with 2% CHX and normal saline (Table 9,10).

Discussion

In the present study, eighty single rooted human extracted mandibular premolars with straight roots and mature apex were selected. The reason for the selection of single rooted teeth with a single canal and having relatively less curvatures was to eliminate the complication likely to arise during instrumentation of severely curved canals. Teeth with mature apices were selected since there wouldn’t have been any control over the amount of apically extruded debris in cases of teeth with open apices.

In the present study, the teeth were ground coronally to keep the root canals similar in length in various subgroups and to create an easy reference point for the determination of working length. Schafer et al reported that to achieve endodontic success, minimum apical preparation for mandibular canines and first premolars should be up to tip size 30. So, all the teeth used in the study were instrumented till apical size 30 for all the groups.

In the present study, Protaper rotary instrument extruded significantly more debris than Mtwo, K3 and Hyflex rotary instrument. The final file of the ProTaper rotary instrument F3 has an apical taper of 0.09, which is much larger than the K3 that has a 0.04 taper. The large taper of the F3 instrument increases the stiffness of the file tip and the use of larger and greater taper apical files performed more aggressive cutting in the root canals. This could have been a reason for more apically extruded debris by Protaper group than the others used in the study.

Greater apical extrusion of debris is seen with Mtwo Rotary Ni-Ti instruments in comparison with K3 and Hyflex files. This may be attributed to its Standardized length preparation technique (Single-length technique) where all the Ni-Ti instruments are taken to full working length and also to the double cutting-edge geometry of Mtwo instruments. Because of its specific design characteristics, cutting efficiency, and its standardized length preparation technique Mtwo Rotary Ni-Ti instruments remove adequate amount of dentin in a short period of time thereby unable to displace the debris coronally, leading to significantly greater amount of apical extrusion of debris. In the present study, this could have been the reason for more AED in case of Mtwo group than K3 and Hyflex group.

HyFlex rotary instruments have been introduced recently. They are made from a controlled memory (CM) NiTi wire, which is manufactured by a unique process that controls the material’s memory. This CM feature makes the files extremely flexible and makes the instruments more resistant to cyclic fatigue than non-CM NiTi instruments. In the present study, the reason for the least debris extrusion with the HyFlex group compared to Protaper, Mtwo and K3 group might be caused by this unwinding feature of the instruments.

According to the results of the present study, apical debris extrusion occurred independent of the type of instrument and irrigant used. The present study showed that different root canal irrigants and different concentrations of irrigants can produce different amounts of AED. In the present study, 2 different concentrations of NaOCl were used because they have different tissue-dissolving ability, and this might influence the amount of AED produced during root canal preparation.

NaOCl is the most frequently used irrigant for root canal preparation. There is no general agreement regarding the ideal concentration of NaOCl that should be used in endodontics. It has been reported that 0.5% NaOCl has the same antibacterial activity compared with 5.25%, but its tissue-dissolving ability is less.

Hence, in the present study, 2 different concentrations of NaOCl (2.5% and 5%) were tested.

The dissolving capability of sodium hypochlorite relies on its concentration, volume, and contact time of the solution but also on the surface area of the exposed tissue. Previous studies have shown that the tissue-dissolving ability of sodium hypochlorite solution decreases if it is diluted.

Chlorhexidine cannot be advocated as the main irrigant in standard endodontic cases, because: (a) chlorhexidine is unable to dissolve necrotic tissue remnants, and (b) chlorhexidine is less effective on Gram-negative than on Gram-positive bacteria.

Conclusion

In conclusion, under the conditions of the present study, all instrumentation systems produced extrusion of debris.
of debris and irrigants apically. All samples of Group 1 (protaper) demonstrated maximum extrusion, while Group 4 (hyflex) demonstrated least extrusion compared to other experimental groups and 5% Sodium Hypochlorite in each group demonstrated maximum extrusion, while Normal saline in each group demonstrated least extrusion.

**Ethical Clearance:** Taken from. Institutional Ethical committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCES**


Clinical Characteristics and Associated Disability of Headache among Medical Undergraduates

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ABSTRACT

Introduction: Headache is the most common neurological disorder and is broadly classified into the migraine headache and tension headache. Students are more susceptible for headache.

Objectives: To determine the proportion, types and triggering factors for headache among medical undergraduates.

Materials and Method: This cross sectional study among 470 medical students was conducted at Kasturba Medical College Mangalore. Medical undergraduates studying in 2nd and 3rd and 4th MBBS were included in the study. Data was collected based on questionnaire, which had 3 sections. Section A includes personal information Section B includes question related to characteristics of Section C includes questions related migraine disability assessment (MIDAS). SPSS Version 11.5 was used for entering and analyzing the data. Descriptive statistics like proportion, mean and standard deviation were used to express the results.

Results: Most of the study participants were females (n=288, 61.3%) and the mean age of study participants was 20.68 (1.35) years. Out of 470 study participants 63% (n=295) of them reported of having headache in the last three months with 78% (n= 230) of them had tension type headache. It was found that 66.8% (n=197) had MIDAS Grade 1 disability.

Conclusion: The present study revealed that majority of the medical undergraduates had headache with tension type being the most common. Most of the students had little or no disability associated with headache.

Keywords: Characteristics, headache, disability, medical undergraduates

Introduction

Headache is the most common neurological disorder and is broadly classified into the migraine headache and tension headache. [¹,²] Tension headaches are common and are due to neck muscles going into spasm. Migraine is a severe form of headache, which shows familial predisposition and is recurrent in nature [²]. Migraine headache has been considered as one among the top 20 debilitating diseases globally [³].

In a study conducted by National Headache Foundation, over 45 million Americans reported to suffer from chronic headache. [⁴] It is estimated that more than 10 percent of school and college students suffer from headache which is more than the combined incidence of diabetes and asthma. [⁵] Tension headaches constitutes majority of headaches and are more common when there is stress and inadequate sleep. [⁶]

Despite of all the researched conducted about various types of headaches in the recent past, the exact etiology of headache is poorly understood and frequently mistreated. [⁷] As lot of stress is associated with students’ life, they are more susceptible to various
headaches. In spite of lot work that has been done in the area of headache, much still requires explanation. Hence, the present study was conducted to determine the characteristics of headache and associated disabilities among the medical undergraduates.

Materials and Method

This cross sectional study was begun after getting the approval from IEC of Kasturba Medical College Mangalore and written informed consent from the study subjects. The sample size of 470 was calculated based on the previous study wherein 46% of the medical students had headache[8] with 10% relative precision and 95% confidence level. Medical undergraduates studying in 2nd and 3rd and 4th MBBS were included in the study. A non-probability sampling was adopted for selection of the study participants. Data was collected based on questionnaire which had 3 sections. Section A includes personal information of the study participants. Section B includes question related to characteristics of headache namely duration, frequency, site, type, severity and triggering factors of headache. Section C includes questions related migraine disability assessment (MIDAS) [9] The questionnaire was prepared after thorough review of literature of published articles and guidelines adopted by International Headache Society (IHS) regarding the classification of headache.

Operational definition of migraine is headache attacks which lasted for 4-72 hours without treatment or failure of treatment which fulfills at least two of the following characteristics: moderate or severe pain intensity, aggravation by or avoidance of routine physical activity, unilateral headache, feelings of pulsation. During migraine, at least nausea and/or vomiting or photophobia and phonophobia is experienced.

Operational definition of tension type headache is attacks which lasted for 30 minutes to 7 days which fulfills at least two of the following characteristics: mild or moderate pain intensity, no aggravation by routine physical activity, bilateral headache, feelings of pressing or tightening (no pulsation). During headache, no nausea or vomiting or no more than one of photophobia or phonophobia. [10]

SPSS Version 11.5 was used for entering and analyzing the data. Descriptive statistics like proportion, mean and standard deviation were used to express the results.

Findings

Table 1: Baseline Characteristics of Study Participants (N = 470)

<table>
<thead>
<tr>
<th>Baseline Characteristics</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age in years ( ± SD)</td>
<td>20.68 ( ± 1.35)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>182</td>
<td>38.7</td>
</tr>
<tr>
<td>Female</td>
<td>288</td>
<td>61.3</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>395</td>
<td>84.0</td>
</tr>
<tr>
<td>NRI</td>
<td>028</td>
<td>06.0</td>
</tr>
<tr>
<td>Foreign</td>
<td>047</td>
<td>10.0</td>
</tr>
<tr>
<td>Academic Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>212</td>
<td>45.1</td>
</tr>
<tr>
<td>Third</td>
<td>145</td>
<td>30.9</td>
</tr>
<tr>
<td>Fourth</td>
<td>113</td>
<td>24.0</td>
</tr>
</tbody>
</table>

It was observed from Table 1 that most of the study participants were females (n=288, 61.3%) and the mean age of study participants was 20.68 (1.35) years.

Table 2: Characteristics of headache among study participants (N =2 95)

<table>
<thead>
<tr>
<th>Headache Characteristics</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of each episode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes</td>
<td>092</td>
<td>31.2</td>
</tr>
<tr>
<td>Hours</td>
<td>192</td>
<td>65.1</td>
</tr>
<tr>
<td>Days</td>
<td>011</td>
<td>03.7</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>046</td>
<td>15.6</td>
</tr>
<tr>
<td>No</td>
<td>249</td>
<td>84.4</td>
</tr>
<tr>
<td>Intensity of pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>109</td>
<td>36.9</td>
</tr>
<tr>
<td>Moderate</td>
<td>167</td>
<td>56.6</td>
</tr>
<tr>
<td>Severe</td>
<td>019</td>
<td>06.5</td>
</tr>
<tr>
<td>Disability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>071</td>
<td>24.1</td>
</tr>
<tr>
<td>No</td>
<td>224</td>
<td>75.9</td>
</tr>
<tr>
<td>Site of pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unilateral</td>
<td>085</td>
<td>28.8</td>
</tr>
<tr>
<td>Bilateral</td>
<td>210</td>
<td>71.2</td>
</tr>
<tr>
<td>Type of pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulsating</td>
<td>169</td>
<td>57.3</td>
</tr>
<tr>
<td>Non pulsating</td>
<td>126</td>
<td>42.7</td>
</tr>
</tbody>
</table>
Out of 470 study participants 63% (n=295) of them reported of having headache in the last three months with 78% (n=230) of them had tension type headache and remaining had migraine type of headache. Among 290 students who had headache, 218 students (73.9%) gave the family history of headache.

Among the participants who had headache attack in the last 3 months, 65.1% (n=192) of them had headache episodes that lasted for hours, 84.4% (n=249) of them did not take medication and most of them suffered from moderate pain (n=167, 56.6%) as depicted in Table 2.

### Table 3: Triggering Factors of Headache (N = 295)

<table>
<thead>
<tr>
<th>Triggering factors</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam</td>
<td>122</td>
<td>41.4%</td>
</tr>
<tr>
<td>Exercise</td>
<td>028</td>
<td>09.5%</td>
</tr>
<tr>
<td>Emotional stress/anxiety</td>
<td>163</td>
<td>55.3%</td>
</tr>
<tr>
<td>Fasting</td>
<td>086</td>
<td>29.2%</td>
</tr>
<tr>
<td>Bright lights/sun</td>
<td>128</td>
<td>43.4%</td>
</tr>
<tr>
<td>Reading hours</td>
<td>065</td>
<td>22.0%</td>
</tr>
<tr>
<td>Smoking</td>
<td>013</td>
<td>04.4%</td>
</tr>
<tr>
<td>Irregular sleep</td>
<td>216</td>
<td>73.2%</td>
</tr>
<tr>
<td>Menstruation</td>
<td>052</td>
<td>17.6%</td>
</tr>
<tr>
<td>Noise</td>
<td>109</td>
<td>36.9%</td>
</tr>
<tr>
<td>Weather changes</td>
<td>046</td>
<td>15.6%</td>
</tr>
<tr>
<td>Unpleasant odour</td>
<td>005</td>
<td>01.7%</td>
</tr>
<tr>
<td>Less water intake</td>
<td>004</td>
<td>01.4%</td>
</tr>
</tbody>
</table>

* Multiple responses

The most common triggering factors of headache among medical students are irregular sleep (73.2%, n=216), emotional stress or anxiety (55.3%, n=163), exposure to bright light or sun (43.4%, n=128), and exams (41.4%, n=122) as shown in Table 3.

### Table 4: Disability Associated with headache as per MIDAS Score (N = 295)

<table>
<thead>
<tr>
<th>MIDAS Grade</th>
<th>MIDAS Score</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (Little/No disability)</td>
<td>0-5</td>
<td>197 (66.8)</td>
</tr>
<tr>
<td>II (Mild disability)</td>
<td>6-10</td>
<td>045 (15.3)</td>
</tr>
<tr>
<td>III (Moderate disability)</td>
<td>11-20</td>
<td>029 (09.8)</td>
</tr>
<tr>
<td>IV (Severe disability)</td>
<td>&gt;21</td>
<td>024 (08.1)</td>
</tr>
</tbody>
</table>

On analyzing the disability associated with headache as per MIDAS score, It was found that 66.8% (n=197) had MIDAS Grade 1 disability followed by mild disability in 15.3% (n=045) among the study participants. Details are shown in Table 4.

### Discussion

The current study focused on the proportion and various types of headache among the medical undergraduates. It also analyzed the characteristics and triggering factors associated with headache.

The current study involved 470 medical undergraduates who were assessed for proportion of headache. It was observed from the study that headache was prevalent in almost two third of the study participants. Similar observation was made in a study conducted at Isfahan University of Medical sciences [11], whereas a study conducted at Athens University [12] and University of Lagos [13] has shown lower proportion of 39.6% and 46% respectively.

After analyzing the various types of headache in the present study, it was evident that more than three fourth of the medical undergraduates were having tension type headache in the preceding three months. Studies done at Isfahan University, University of Lagos, Kuwait and Sultan Qaboos University also shown higher proportion of tension headache among their student population. [11, 13,14, 15]

The proportion of migraine among females was more in a study done at Kuwait by Al-hashel. [14] Similar observation were also made at Isfahan University of Medical Sciences [11], Sultan Qaboos University [15] and Univesity of Lagos. [13]

In contrast to a study conducted at University of Lagos [13] where a family history of headache was found in less than quarter of study participants; in the present study it was nearly three fourth.

In the present study, it was found that most common triggering factors of headache among medical students were irregular sleep, emotional stress or anxiety, exposure to bright light or sun and exams. A finding similar to this was made in the study conducted at Kuwait, wherein stress, irregular sleep, substantial reading, smoking, fasting and exams were quoted as the common triggering factors for headache among student population. [14]
Conclusion

The present study revealed that majority of the medical undergraduates had headache with tension type being the most common. The major triggering factors being irregular sleep, emotional stress or anxiety. Most of the students had little or no disability associated with headache.

Source of Funding: Nil

Conflict of Interest: None to declare

Ethical Clearance: Taken from Institutional Ethics Committee of KMC, Mangalore

REFERENCES


Cardiotocography Class Status Prediction Using Machine Learning Techniques

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ABSTRACT

Physicians used Cardiotocography (CTG) to knowing of fetal well-being and potential complications from pregnant women. They used a continuous electronic record of the baby’s heart rate took from the mother’s abdomen. They visualized the unhealthiness that will give an opportunity for early intervention. CTG class status is classified in this paper with machine learning methods by using attributes of data obtained from the uterine contraction (UC) and fetal heart rate (FHR) signals and visualized the acquired information. This classification and visualization will help the doctor while treatment the patient. Experimental results has shown good accuracy score and low error rate.

Keywords: Cardiotocography; classification; machine learning; data mining; uterine contraction; fetal heart rate;

Introduction

In recent years technology of Data mining especially machine learning having many new developments. Also techniques improvements in machine learning had contributed in handling of new kinds of data types and applications. However, the field of machine learning and its application in medical domain is still active so that the possibilities of the application are still limitless [1-5]. Comprehensible knowledge extraction from medical CTG data is one of the challenges in this domain of research. So the use of machine learning tools is gradually increased day by day. This is mainly because the effectiveness of classification with machine learning and recognition systems has improved in a great deal to help medical experts in diagnosing diseases [1-5].

CTG is a technical means of recording the FHR, UC during pregnancy, typically in the third trimester to evaluate maternal and fetal well-being [6]. FHR patterns are observed manually by obstetricians during the process of CTG analysis. The currently proposed computation and machine learning techniques for FHR can be used for analyzing and classifying the CTG data to avoid human mistakes and helps the doctors to take a decision.

Literature Survey

Magenes G et al., [6] proposed classification method with neural process, that will describe states of fetal behaviors under fetal pathological conditions, with CTG data. In this approach the classifiers are trained and tested with fetal heart rate signals data.

Warrick PA et al., [7] proposed a classification model with SVM. In this authors trained the model with UP and FHR signals data and finding the relation in terms of an impulse response function. They obtained the results with a detector that combined the decisions of classifiers using both feature sets. It detected half of the pathological cases, with very few false positives.

Jacob SG, Ramani RG [8] used the Cardiotocography dataset, forming the clustering, and tells the significance of each attribute. In this work authors first analyze, then compare and then declare the impact of machine learning techniques by detecting outliers, executing ML techniques on Cardiotocography dataset.

Sahin H and Subasi A. [9] evaluated the eight prominent ML techniques for classification on the CTG data. It is necessary to predict newborn babies health, especially for the critical cases.

Sundar. C et al., [10] implemented a classification model with artificial neural network (ANN) for CTG data. According to their classification metrics, the performance of the proposed classification provided significant performance.
Tomáš P et al., [11] proposed a model that will automatically recognizes the prenatal care states. This models is mostly used in prenatal care for support decision systems

Spilka J et al., [12] proposed the model for FHR classification and evaluated conventional features and compared them to the nonlinear ones. The experiments were performed using a database of 217 FHR records with objective annotations, i.e. pH measurement.

Ocak H, Ertunc HM. [13] presented a model that will predicts the fetal state from FHR & UC signals from CTG data. The proposed scheme is with adaptive neuro-fuzzy inference systems (ANFIS). The proposed model predicted the normal and the pathological state.

Esra Mahsereci Karabulut, Turgay Ibrikci [14] used the adaptive boosting ensemble of decision trees for predicting the CTG data. They analyzed the CTG features and they also compared with the prominent ML techniques.

Yılmaz E, Kılıkçıer Ç[15] proposed a classification model with least squares support vector machine (LS-SVM) that will use a binary decision tree. They used CTG data to determine the fetal state.

Permanasari AE, Nurlayli A [16] proposed a model for classification with decision tree to analyze the CTG data for fetal state. In this author classified three classes called normal, suspicious or pathologic.

In a review of articles published on this subject, it was found that its important area which will give the good information. So, in this work, we are going to evaluate some of the statistical, machine learning techniques for the classification of CTG data.

Methodology

The system design proposed in this paper comprises of data pre-processing, model design and model evaluation.

Data pre-processing: In this phase, the training dataset is downloaded from the UCI Irvine Machine Learning Repository and is described by 2126 instances of Cardiotocography data and 23 attributes out of which 1 to 22 considered as input attributes and 23th attribute NSP is considered as output variable class. Hence this paper focuses on the performance of multi-class categorization. All the attributes in the dataset are considered because every attribute having their own importance. In this step we are standardized the dataset with standard scalar function provided by Python.

Model Design: In this phase, standardized dataset from pre-processing phase is taken and split it into parts based on 75% and 25% criteria one is for training and another is for testing. The training dataset is given as input to classifier model. In this paper three classification techniques called Decision tree classifier, Random forest classifier and AdaBoost classifiers are used. These three classification methods are trained by training dataset. After successful completion of training, models are tested with testing dataset.

Model evaluation: In this phase, used models are evaluated with evaluation metrics called Accuracy, precision, recall, F1 score etc.,

Decision Tree Classifier[17]: It uses a decision tree, where the target variable can take a discrete set of values are called classification trees. It initially pick the best attribute/feature, the best attribute is one which best splits or separates the data. For best attribute selection it used information gain or Gini index (Binary tree).

Random forest Classifier[18]: It is an ensemble algorithm. It created by a set of decision trees from randomly selected subset of training set. It then aggregates the votes from different decision trees to decide the target class.

AdaBoost Classifier[19]: It is also called Adaptive Boosting. It fits a sequence of weak learners on different weighted training data. It starts by predicting original data set and gives equal weight to each observation. If prediction is incorrect using the first learner, then it gives higher weight to observation which has been predicted incorrectly. This process can be performed iteratively until a limit is reached in the number of models or accuracy.

Dataset

Cardiotocography Data Set is downloaded from UCI repository, consists of measurements of fetal heart rate (FHR) and uterine contraction (UC) features on cardiotocograms classified by expert obstetricians. 2126 fetal cardiotocograms (CTGs) were automatically
processed and the respective diagnostic features measured. The CTGs were also classified by three expert obstetricians and a consensus classification label assigned to each of them. Classification was both with respect to a morphologic pattern (A, B, C, ... ) and to a fetal state (N, S, P). Therefore the dataset can be used either for 10-class or 3-class experiments. But in this paper, we considered 3-class called fetal state.

The dataset consists of 2126 instances and 23 attributes, out of which 1 to 22 considered as input attributes and 23th attribute NSP is considered as output variable class. This output variable further having three classes called N=normal represented with 1, S=suspect represented with 2 and P=pathologic represented with 3.

**Attribute Information:**

- **LB** - FHR baseline (beats per minute)
- **AC** - No. of accelerations per second
- **FM** - No. of fetal movements per second
- **UC** - No. of uterine contractions per second
- **DL** - No. of light decelerations per second
- **DS** - No. of severe decelerations per second
- **DP** - No. of prolonged decelerations per second
- **ASTV** - percentage of time with abnormal short term variability
- **MSTV** - mean value of short term variability
- **ALTV** - percentage of time with abnormal long term variability
- **MLTV** - mean value of long term variability
- **Width** - width of FHR histogram
- **Min** - minimum of FHR histogram
- **Max** - Maximum of FHR histogram
- **Nmax** - No. of histogram peaks
- **Nzeros** - No. of histogram zeros
- **Mode** - histogram mode
- **Mean** - histogram mean
- **Median** - histogram median
- **Variance** - histogram variance
- **Tendency** - histogram tendency
- **CLASS** - FHR pattern class code (1 to 10)
- **NSP** - fetal state class code (N=normal; S=suspect; P=pathologic)

Fig 2 has shown the histogram of 1 to 22 features, from Fig 1, it is observed that every feature is important. Fig 1 shows the Bar plot of attribute 23, from fig 1, it is observed that class 1 having 1655 instances, class 2 having 295 and class 3 having 176 instances. Fig 3 shows the diagonal correlation matrix of 1 to 22 input attributes.

**Class Information:** We used the data for a three class classification problem. The descriptions for the three classes are *Normal*: A CTG where all four features fall into the reassuring category

**Suspicious**: A CTG whose features fall into one of the non-reassuring categories and the reassuring category and the remainder of features are reassuring

**Pathological**: A CTG whose features fall into two or more of the Non-reassuring the reassuring category or two or more abnormal categories.

![Fig. 1: Bar plot of 23rd target attribute](image-url)
Fig. 2: Histogram of 1 to 22 attributes
Result Analysis

**Accuracy:** It is computed as “the total number of two correct predictions, True Positive (TP) + True Negative (TN) divided by the total number of Positive (P) + Negative (N)”.

\[ \text{Accuracy} = \frac{TP + TN}{P + N} \]

**Precision:** It is computed as “the number of correct positive predictions (TP) divided by the total number of positive predictions (TP + FP)”.

\[ \text{Precision} = \frac{TP}{TP + FP} \]

**Recall:** It is computed as “the number of correct positive predictions (TP) divided by the total number of positives (P)”.

\[ \text{Recall} = \frac{TP}{P} \]

**Confusion Matrix:** It is a summary of prediction values on a classification problem. It shows the classification models predictions. It gives us insight not only into the errors being made by a classifier but more importantly the types of errors that are being made.

Evolution metrics of DTC classifier for CTG dataset is shown in Table 1. Evolution metrics of RF classifier for CTG dataset is shown in Table 2. Evolution metrics of AdaBoost classifier for CTG dataset is shown in Table 3. Confusion matrix of DTC classifier for testing dataset is shown in Fig 4, Confusion matrix of RF classifier for testing dataset is shown in Fig 5, Accuracy and F1 score comparison of DTC, RF and AdaBoost classifiers is shown in Fig 6.

F1 score comparison is accurate to this dataset because target class data is unequally distributed. From Fig 6, it is observed that DTC classifier exhibits good F1 score of 96.4 which is good score than other two classifier. So it is concluded that DTC is good fitting method for CTG dataset.
Table 1: Evolution metrics of DTC for CTG dataset

<table>
<thead>
<tr>
<th></th>
<th>Precision</th>
<th>Recall</th>
<th>f1-score</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.98</td>
<td>0.99</td>
<td>0.98</td>
<td>410</td>
</tr>
<tr>
<td>2</td>
<td>0.93</td>
<td>0.89</td>
<td>0.91</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>50</td>
</tr>
<tr>
<td>avg/total</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>532</td>
</tr>
</tbody>
</table>

Fig. 4: Confusion matrix of DTC

Table 2: Evolution metrics of RF for CTG dataset

<table>
<thead>
<tr>
<th></th>
<th>Precision</th>
<th>Recall</th>
<th>f1-score</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.97</td>
<td>0.99</td>
<td>0.98</td>
<td>410</td>
</tr>
<tr>
<td>2</td>
<td>0.94</td>
<td>0.81</td>
<td>0.87</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
<td>50</td>
</tr>
<tr>
<td>avg/total</td>
<td>0.96</td>
<td>0.96</td>
<td>0.96</td>
<td>532</td>
</tr>
</tbody>
</table>

Fig. 5: Confusion matrix of RF classifier

Table 3: Accuracy and F1 scores of DTC, RF and AdaBoost classifiers

<table>
<thead>
<tr>
<th></th>
<th>Accuracy</th>
<th>F1 Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTC</td>
<td>97.55</td>
<td>96.40</td>
</tr>
<tr>
<td>RF</td>
<td>96.24</td>
<td>93.46</td>
</tr>
<tr>
<td>AdaBoost</td>
<td>92.29</td>
<td>81.34</td>
</tr>
</tbody>
</table>

Fig. 6: F1 scores and Accuracy of different models

Conclusions

Computer based studies especially machine learning models place vital role in every field of research, medical diagnosis is also one of the area that leads to great advance in clinical decision support systems. Due to computer based studies importance, in this paper we designed a prediction model which classified the CTG dataset class status which is very useful to doctor while treating the patient. Experiments are conducted based on CTG dataset, and gained good evaluation metrics for DTC, RG and AdaBoost classifiers. DTC gained 96.40% of F1 score, RF gained 93.46 % F1 score and AdaBoost gained 81.34% F1 score.

Ethical Clearance: Cardiotocography Data Set is downloaded from UCI repository, consists of measurements of fetal heart rate (FHR) and uterine contraction (UC) features on cardiotocograms and classified by expert obstetricians. 2126 fetal cardiotocograms (CTGs) were automatically processed and the respective diagnostic features measured. Different classifiers are applied on testing data based on the values of training. The classifiers are predict the data and validation will applied on predicted data, testing and training data.

Source of Funding: Self

Conflict of Interest: Nil
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Revenge Pornography: Impact on the Mental Health of Victims and Legal Remedies

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ABSTRACT

Revenge porn is one of the most devastating cyber sexual crime all over the world. The latest mobile and communication technologies have resulted in easy uploading and accessing the online content. The perpetrator may be an unsuspecting facebook friend, an anonymous stalker or a jilted lover. But once the damage is done, the victim’s life is never the same. This paper analyses the legal approach to the problem of revenge porn in UK and India, its impact on victims and possible preventive measures to address the related issues.

Keywords: Revenge, porn, perpetrator, technology, impact

Introduction

The advancements in information technology has changed the moral codes of conduct in society. Images can be uploaded and downloaded with ease at the click of a mouse. The development of technology assisted communication and instant messaging especially through mobile phones has led to a new forms of sexual crimes such as cyber harassment, cyber stalking and revenge porn. Though all these crimes have serious repercussions on the mental health of the victims but revenge porn is the most damaging of all. In most of these crimes the victims are generally females usually teens and young adults. This paper analyses the crime of revenge porn, legal options available in India and its psychological impact on the victims.

Salter M and Crofts T define revenge porn as images and videos made by men with the consent of the women they were intimately involved with, but then distributed online without her consent typically following the termination of a relationship.¹ The perpetrator may be known or unknown to the victim. This could be the work of a jilted lover, ex-boyfriend, or even a cyber stalker who may have gained access to victim’s pictures somehow. So the real motivation behind the crime may be revenge, entertainment or even profit-making.² According to an estimate, in England and Wales, the number of alleged cases being investigated by officers has more than doubled in the last four years – from 852 in 2015-16 to 1853 in 2018-19.³ This number is expected to rise in future due to the popularity of social media platforms and instant transmission methods.

Impact on Mental Health of Victims: The victims can get the content removed and deleted from the internet. But the major issue seems to be that even if the content is removed online, there may still be links available or dead pages displaying the name of the victim. The victims experience a feeling of humiliation, ashamed, exposed and loss of reputation. They may have to live under a different identity and a different get up life long. They may sue the perpetrators and the websites for damages but the pain and humiliation remains. Victims may experience a general loss of trust in others after being victimized by revenge porn. Along with the loss of trust and feeling of betrayal, many participants may experience more severe and disruptive mental health effects such as Post-traumatic Stress disorder (PTSD), anxiety, and depression and suicidal tendencies. These experiences are more or less the same as those experience by victims of sexual assault.⁴ For managing these psychological effects, the victims are required to undergo long term counselling and also need family support.

Legal Approach in UK: Revenge porn became an offence in England and Wales in April 2015. It is a
specific offence under the Criminal Justice and Courts Act, 2015 which involves distribution of private and personal explicit pictures, images, or videos of an individual through online or offline medium. Similar laws were introduced in Northern Ireland and Scotland. This is usually done maliciously by perpetrators so as to cause embarrassment, distress and shame to victims in public. Under the Act, if found guilty, the accused can be sentenced up to two years in prison. The Revenge Porn Helpline in UK is dedicated to supporting the victims of intimate image abuse. Social media platforms like Twitter, Facebook and search engines like Google etc. have prohibited the posting of revenge porn and sexual images without the consent. However, the revenge porn laws have been criticized on the ground that they do not afford anonymity to the complainant or victim which results in further victimization of the victims. Revenge porn is currently categorized as a “communications crime”, meaning that victims are not granted anonymity. During the court case, victims who have already been publicly shamed, embarrassed, and abused are expected to come forward without the guarantee of anonymity, drawing further publicity to their case and subsequently, their images.

**Legal Approach in India:** In India, revenge porn is not a specific crime under the law in India. Indian law criminalises dissemination of obscene content for whatever purposes it may be. Also there is lack of ground level sensitivity on part of the authorities to deal with the cases of revenge porn. The legal provisions under which the accused can be booked are:

- Section 67 and 67A of the Information Technology Act, 2000
- Section 500 of Indian Penal Code (hereinafter IPC) for criminal defamation
- Section 504 and 506 of IPC for criminal intimidation
- Section 354 and 509 IPC for outraging the modesty of women
- Section 354 A to D of IPC for sexual harassment, compelling to disrobe, voyeurism and intent to dishonor respectively.

The conservative and patriarchal set up of Indian society is not usually victim-friendly and the girl is blamed for sharing her intimate images. As a result very few victims may come forward to report the crime or may continue to be further victimized by the perpetrator. Because of this the actual filing of cases may be very few and the magnitude of the problem in India is still not known due to poor reporting. The first ever conviction in India for revenge porn was done by a court in East Midnapore, Bengal some time back, where the accused was jailed for five years. A beginning has been made and more such convictions would definitely have a deterrent effect on the perpetrators.

**Conclusion**

As a preventive measure, cyber awareness programmes may be conducted in schools and colleges for the younger generations so that they do not fall into the trap of sharing their intimate images. Also public awareness should be created to respect others’ privacy and consent. Intermediaries and service providers need to be held responsible for spread of content without the consent of those whose sexual images or videos are uploaded. It is their duty to ensure that the illegal content is not uploaded and is completely deleted from the public domain if uploaded at all. Victim’s identity must be protected at all costs by the authorities during the trial. Society needs to change its mindset and attitude towards the victims. Free of cost counselling and rehabilitative services needs to be provided to the victims by the State.

**Ethical Clearance:** Not applicable

**Source of Funding:** Self

**Conflict of Interest:** Nil

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An Analysis of Job Insecurity of Employees Working on I.T. & ITeS Companies, Resulting in Stress and Health Problems & their Perception towards the Career Growth —A Study with Reference to Chennai City

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ABSTRACT

To analyze the depth of job insecurity and their indifferent sustainable development towards their career growth which affects the morale of the employees and in turn which leads to stress were taken in this study domain. To measure the influence of personal and organizational profile of the employees on their perception towards job insecurity. Job insecurity is one of the most common stressors in contemporary working life. Job insecurity is so stressful from a variety of physical and psychological problems, including heart disease, loss of sleep and psychological distress. Job security companies’ results in developing core competencies and managerial capabilities by increasing the value of the workforce and provides career opportunities and in retaining quality employees. The employees prefer working for companies with full job security engaging them in challenging work involving cutting edge technology that is possible through effective HRM practices. It also results to next generation job aspirants expecting to possess a positive attitude towards the profession and equip themselves with the required skills to enter the industry and also gear up for their sustainable development in the career growth.

Keywords: Job insecurity, Health problems, Career growth, Psychological problems.

Introduction

Job insecurity is a major work related stressor, which affects growing number of workers. Exposure to job insecurity has been linked to a number of negative health outcomes, particularly mental health. In recent years, job insecurity and a sustainable development growth has become more relevant for employees and organizations. The global situation and the world economy have undergone major changes in recent decades, which have affected organizations. These global changes have called for alterations in organizations and organizational practices in order for companies to be able to survive in this new context with increased competitiveness. There has been a decline in the use of long-term employment and thus in life-long tenure as well, which were the standard previously. Today, employees need to be able to deal with organizations need for flexibility, while loyalty to the organization, which formerly predominated employee’s behavior and attitudes, has taken a back seat. This also means that organizations are less likely to provide an opportunity for the organizational career, a life-long employment with one employer. In comparison to before, when organizations were more likely to provide security and sustainable development, employees today often need to ensure their own security by staying employable. Technology has advanced rapidly with the increasing and there have been some negative effects on working life from these new technologies; the boundaries between work and life outside work have been blurred, increasing the risk of working always and everywhere, especially in situations where working hours are unclearly regulated. When dealing with information overload, which can be caused by the new technologies and by the increased pace and amount of work employees have to accomplish, work stressors might spill more easily over into the non-work domain. It is well established that job insecurity affects both the individual and the organization. Job insecurity found relations between job insecurity and the aspects of
decreased job satisfaction, organizational commitment, trust, performance, job involvement, mental and physical health along with their sustainable development, and increased turnover intention. Outcomes of job insecurity may be  

Health related problems such as hypertension, anxiety and depression. In addition, mental health as well as family life may be affected negatively. It is also to be noted that their work life balance may fluctuate to the point of reaching unsteadiness.

**Literature Reviews**

1. Banu et al(2012), In this study the researcher found out that seasonal workers perceive higher job insecurity compared to permanent workers. They are also affectively less committed to their organizations than permanent workers. Furthermore, job insecurity does not mediate the relationship between contract type and affective commitment
2. Beatriz Sora et al (2010), In an innovative study the researchers attempted to measure the consequences of job insecurity for employees in the midst of liberation and globalization of the respective economies they argued that the job insecurity has tremendous impact over employees work attitude and intention. The results also revealed job insecurity adversely affects job satisfaction and organizational commitment. It perceived that work stressor and negatively creative over employees attitude
3. Bert Klandermans (2010), In this study the researcher finds that job insecurity has adverse affects on psychological well being and it also self esteem. It also reveals that job insecurity even leads to job loss.
4. Bert Klandermans et al (2010), In this study the researcher states that the impact of ones job loss depends upon the individual employment status. The job insecurity reflects health problems and the objective conditions, severity of job loss and depending upon employment status.
5. J.H. Buitendach, (2005), In this study the results revealed that there is small but significant relationships between job insecurity, extrinsic job satisfaction, job insecurity and affective organizational commitment. Job satisfaction was found to mediate the relationship between job insecurity and affective organizational commitment.
6. Claudia Bernhardet al (2011), the researcher in this study investigates job insecurity affects the individual well being. Job insecurity is negatively related to organizational outcomes and it is associated with lower affective organizational commitment and higher turnover intentions.

**Research Gap:** After investigating the national and international literature reviews regarding the job insecurity reflects health & stress problems and Job insecurity of employees and their sustainable development in the career growth in IT and ITeS companies, the researcher identified two predominant gaps which are still unaddressed at national and international level.

1. Are there any sufficient number of factors able to determine that job insecurity and perception towards sustainable development in their career growth of employees in the growing IT companies.
2. Is there any correlation between the employee’s perception and that job insecurity & sustainable development of their career growth in IT and ITeS companies.

These two predominant gaps are ventured by the researcher to find the solutions to fulfil them.

**Objectives of the Study**

1. To analyze the depth of job insecurity reflects health & stress problems and its perception towards sustainable development of their career growth affecting the employees in the study domain
2. To measure the influence of personal and organisational profile of the employees on their perception towards job insecurity & sustainable development in their career growth.

**Hypothesis:**

1. There is no significant difference among the employees perception towards job insecurity & sustainable development in their career growth in IT and ITeS companies.
2. The following Hypothesis were formulated:

Perceived Job insecurity is associated with reduced affective commitment and increased job related stress.

Methodology

The IMFL companies in Tamilnadu was selected as a suitable setting to test the proposed model. Mainly the focus was on the HRM practices in IMFL companies in Chennai. The main reasons for selecting this industry are:

(1) Availability of a higher number of IMFL companies
(2) availability of more number of employees working in these companies.

The unit of analysis in this study is the “Job insecurity”. So identifying the dyads that would provide the needed information is the key to this project. In order to ensure higher number of dyads, a total of ten companies five each in IT companies were focused for the study. The researcher circulated totally 572 questionnaires in IT companies and received 556 responses, among them 16 of them are found with flaws, hence the sample size of the research is 540.

Data Analysis: The application of K-means cluster analysis classified the employees concerned to HRM practices into three clusters namely perfection seekers, Unambitious employees and enthusiastic employees with respect to their perception towards HRM practices. Similarly, the employees concerned to job insecurity and trust are classified into three groups, security employees, attached employees and dedicated employees. The association between these two clusters was verified.

Analysis and Discussion

Classification of Employees Based on the Insecurity and Employee Trust: Result show that employees at risk of losing their jobs showed higher levels of perceived stress, anxiety, depression, and negative feelings and lower levels of positive feelings compared to employees not at risk of losing their jobs. The samples units into heterogeneous groups and their nature of heterogeneity are anatomically analyzed by the perceptual differences of Employees are identified through k-means cluster analysis by classifying the sample unit in the following way.

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Job insecurity</th>
<th>Reliability</th>
<th>Organization caring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.79</td>
<td>2.79</td>
<td>2.45</td>
</tr>
<tr>
<td>2</td>
<td>3.97</td>
<td>3.97</td>
<td>3.02</td>
</tr>
<tr>
<td>3</td>
<td>2.92</td>
<td>4.92</td>
<td>4.73</td>
</tr>
</tbody>
</table>

Table 1: Final Cluster Centers

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Number of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>204,000</td>
<td>37.78%</td>
</tr>
<tr>
<td>2</td>
<td>205,000</td>
<td>37.96%</td>
</tr>
<tr>
<td>3</td>
<td>131,000</td>
<td>24.25%</td>
</tr>
<tr>
<td>Valid</td>
<td>540,000</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 2: Number of Cases in each Cluster

The first cluster consists of 204 employees (37.78%) highly agree with job insecurity and disagree with reliability and organization caring. Therefore this group is known as Security seekers.

The second group 205 employees (37.96%) moderately agree with job insecurity, reliability and organization caring. Therefore they are called as Attached employees.

The third group 131 employees (24.25%) disagree with job insecurity and strongly agree with reliability and organization caring, hence they can be label as Dedicated employees.

Association between Job Insecurity and Employee Trust And existing Innovative Hr Practices in IT and ITeS: Factor analysis by principal component method derived the factors of job insecurity and employee trust in IMFL companies. These factors are considered as the basis to classify the employees into heterogeneous groups. Therefore it is essential to establish the Associations between the clusters of employee’s perception on job insecurity and employee trust and existing innovative HR practices in IMFL companies. In particular the existing innovative HR practices are 360 degree appraisal, performance based incentive, best employee award, attitude survey, competency mapping, higher studies for advancement at its expenses, flexible working hours, best suggestion award and work from home. Vice versa in the case of those who are all not performing well will lead to down grading of their status due to which psychology of the employee will lead to stress and stain resulting in mental illness.
Association between Job Insecurity and Employee Trust and 360 Degree Appraisal Systems: The existing innovative practice 360 degree appraisal system practiced in the organisation provide the employees job insecurity and trust in the IMFL companies they work. The association between clusters of job insecurity and employee trust and 360 degree appraisal practiced in IMFL companies is verified in the following table.

<table>
<thead>
<tr>
<th>Commitment</th>
<th>360 degree appraisal practices</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Security seekers</td>
<td>Count</td>
<td></td>
</tr>
<tr>
<td>Attached employees</td>
<td>Count</td>
<td></td>
</tr>
<tr>
<td>Dedicated employees</td>
<td>Count</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td></td>
</tr>
</tbody>
</table>

From the above table, it is found that 77% of security seekers, 63.9% of attached employees and 41.2% of dedicated employees agreed towards their companies practicing 360 degree appraisal system and would provide job insecurity and employee trust among the employees working in IMFL companies. This leads to the computation of chi-square statistics as stated in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>43.924(a)</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>43.836</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>42.601</td>
<td>1</td>
<td>.000</td>
</tr>
</tbody>
</table>

From the above table it is found that chi-square = 43.924, p=.000, therefore it can be concluded that there is association between job insecurity and employee trust and practice of 360 degree appraisal system in the IMFL companies. This implies the rigors 360 degree performance appraisal system is a very important factor as it determines the quality of the performance appraisal during the end of the year and recognizes the suitable rewards for the executive employees in the IMFL Company.

Findings and Conclusion

In IT and ITeS companies there is association between job insecurity and trust of the employees and practice of 360 degree appraisal system, performance based incentive system, best employee award, attitude survey, competency mapping, higher studies for advancement at its expenses, flexible working hours, best suggestion award, working at home.

The job insecurity reflects health problems and the objective conditions, severity of job loss and depending upon employment status. Whereas the job security companies’ results in developing core competencies and managerial capabilities by increasing the value of the workforce and provide career opportunities by the way of sustainable development of their career growth there by retaining quality employees. The employees prefer working for companies with full job security engaging them in challenging work involving cutting edge technology that is possible through effective HRM practices like sustainable development in their career growth. It also results to next generation job aspirants expecting to possess a positive attitude towards the profession and equip themselves with the required skills to enter the industry. In the case of the employees mentality of job insecurity, has adverse affects on psychological well being and it also self esteem. It also reveals that job insecurity even leads to job loss.

Conflict of Interest: Nil

Ethical Clearance: Taken from UGC Committee

Source of Funding: Self
REFERENCES


Estimation of Serum Fasting Insulin in Patients with Acne Vulgaris and Compares these Values with that in Controls

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ABSTRACT

Introduction: Acne is a multifactorial inflammatory disease affecting the pilosebaceous follicles of the skin. Acne is a disorder resulting from the effect of hormones and other substances on the oil glands (sebaceous glands) and hair follicles present in the skin. The aim of this study was estimation of serum Fasting insulin in patients with acne vulgaris and compares these values with those in controls.

Methodology: This is the case control study which was carried out in the Departments of Biochemistry and Dermatology & Venereology of SGT Medical College Gurgaon. Fifty patients each of Mild (group I), Moderate (group II) and Severe Acne Vulgaris (group III) in age group 15-40 years were included as cases.

Result: In the present study, the level of serum insulin was significantly higher in moderate cases of acne as compared to controls. Therefore we suggest that insulin may also play an important marker for causing acne. Insulin stimulates the secretion of ovarian estrogen, androgen and progesterone which is consistent with our studies as increase in estrogen and testosterone has also been observed in moderate cases of acne.

Conclusion: Insulin was significantly higher in moderate cases as compared to controls. There by suggesting that insulin may play an important role to causation of acne.

Keywords: Insulin, acne vulgaris, multifactorial inflammatory disease

Introduction

Acne Vulgaris, chronic inflammatory dermatosis, insulin, hormonal misbalanced

Acne Vulgaris is a chronic inflammatory dermatosis notable for open or closed comedones (blackheads and whiteheads) and inflamatory lesions, including papules, pustules, or nodules (also known as cysts)¹.

The grading system of acne is based on the morphology of lesions. Acne was graded according to the Consensus Conference on Acne Classification convened by American Academy of Dermatology in Washington DC on 24-25 March, 1990².

According to these criteria:

- Mild acne is defined by the presence of comedones, without significant inflammation and a few or no papules
- Moderate acne, by the presence of comedones, with marked inflammatory papules and pustules
- Severe acne, by the presence of inflammatory nodules, in addition to comedones, papules and pustules.

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The extra sebum or oil that is produced by the sebaceous glands mixes with dead skin cells and bacteria on the skin’s surface and blocks these pores. Within the blocked pore, bacteria multiplies and cause inflammation. All of this leads to the lesions that are associated with acne. The pathophysiology of acne vulgaris can be broken up into four different events:

1. Androgen-dependent overproduction of sebum
2. Follicular hyperkeratosis (closed and open comedones)
3. Increase in microbial flora (Propionibacteria acnes)
4. Immunological processes and inflammation

These events are not individual events, and are affected by each other. For example, the increase in proliferation of Propionibacteria acnes is a result of increased sebum production, as well as hyperkeratosis. However, the bacteria are responsible in part for producing factors such as bacterial lipases, proteases, hyalurinadases and chemotactic factors that stimulate inflammatory mechanisms. Follicular inflammation can also cause an increase in sebum production.

The acne develops predominantly in adult age; possible reasons for this are diet, lifestyle and more synthetic hormones in our environment (foods, water, plastics and medicatin). By early recognition, the etiology and treatment protocol of acne may prevent unwanted conditions. Since its first clinical description, acne has always been the subject of a great number of studies and research. But only very few of them dealt with the history of the disease focusing on semantic considerations. Therefore in the present work estimation of Fasting insulin in serum of patients with different grade of acne vulgaris patients will be analyzed and to compare with control groups.

**Material & Method**

This is the case control study which was carried out in the Departments of Biochemistry and Dermatology & Venereology of SGT Medical College Gurgaon. Fifty patients each of Mild (group I), Moderate (group II) and Severe Acne Vulgaris (group III) in age group 15-40 years were included as cases. All of them presented to the OPD of Departments of Dermatology & Venereology of SGT Medical College Gurgaon and students of SGT University of varies faculty. A detailed history was taken and clinical examination was done. Fasting sample for estimation of all parameters was taken on second day of menstruation after the diagnosis was confirmed. Fifty healthy age matched females were recruited for the study as controls (group IV). Controls consisted of healthy volunteers. None of them had any prior history of medical disorders. Fasting sample was taken for the controls also. Duration of this study was one year (01/06/2015 to 31/05/2016). Institutional ethical committee clearance was also taken on 1/05/2015.

**Selection of Cases: (Group I, II and III)**

**Inclusion criteria for group I:** Fifty clinically diagnosed females were taken with Mild Acne Vulgaris, consists of open and closed comedones and some papules and pustules, based on detailed clinical history and examination.

**Inclusion criteria for group II:** Fifty clinically diagnosed females were taken with moderate Acne Vulgaris, consists of more frequent papules and pustules with mild scarring, based on detailed clinical history and examination.

**Inclusion criteria for group III:** Fifty clinically diagnosed females were taken with severe Acne Vulgaris, contains all of the above, plus nodules and abscesses and more scarring, based on detailed clinical history and examination.

**Inclusion criteria for control group IV:** Fifty healthy age matched females were taken as controls.

**Exclusion criteria: (group I, II, III and IV)**

- Patients on immunosuppressive therapy like corticosteroids, regular analgesic intake and hormonal therapy.
- Patients with concomitant inflammatory or autoimmune disease
- Patients with acute or chronic infections.
- Patients with acute or chronic inflammatory disorder.
- Patients with Acne other than Acne Vulgaris

**Sample Collection and Storage:** The samples were collected on the second day of menstrual cycle of the patient and before the start of treatment. Written and informed consent was taken from all subjects in the cases and control groups after explaining about the details of the study.
5ml venous fasting blood samples were taken from all the four groups of our study subjects in plain vacutainer under sterile conditions. Samples were centrifuged and separated immediately. Then serums were stored at -20°C till the time of analysis.

**Estimation of Insulin**

**Reagents**
- **Insulin Bead Pack:** Coated with monoclonal murine anti-insulin antibody.
- **Insulin Reagent Wedge:** Alkaline phosphatase (bovine calf intestine) conjugated to polyclonal sheep anti-insulin antibody and alkaline phosphatase (bovine calf intestine) conjugated to monoclonal murine anti-insulin antibody in buffer.
- **Insulin Adjustors:** Two vial (low and High), lyophilized insulin in a nonhuman serum matrix, with preservative. At least 30 minutes before use, reconstitute each vial by adding 4.0ml distilled or deionized water. Mix by gentle swirling or inversion.
- **Insulin Controls:** Two vials of lyophilized insulin in a nonhuman serum matrix, with preservative. At least 30 minutes before use, reconstitute each vial by adding 4.0 ml distilled or deionized water mix by gentle swirling or inversion.

**Statistical Analysis:** Data was collected and mean and SD for all the parameter was calculated. Statistical analysis was performed by the SPSS program for Windows, version 17.0.

**Result**

**The Study Group:** A cohort of Fifty female patients each of Mild (group I), Moderate (group II) and Severe Acne Vulgaris (group III) in age group 15-40 years, seen from 01/06/2015 to 31/05/2016 formed the study group.

**The control group:** Fifty healthy age matched females were recruited for the study as controls.

**Table 1: Frequency of cases in Mild, Moderate, Severe and Control**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>50</td>
</tr>
<tr>
<td>Cases</td>
<td>150</td>
</tr>
<tr>
<td>Mild</td>
<td>50</td>
</tr>
<tr>
<td>Moderate</td>
<td>50</td>
</tr>
<tr>
<td>Severe</td>
<td>50</td>
</tr>
</tbody>
</table>

In the present study, total 150 cases which were subdivided into mild 50 cases (25%), moderate 50 cases (25%) and severe Acne Vulgaris 50 cases (25%). The control group had 50 cases (25%). These values shows in Table 1.

**Table 2: Frequency of age distribution in control, mild, moderate and severe cases**

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Control Frequency (%)</th>
<th>Cases Mild Frequency (%)</th>
<th>Cases Moderate Frequency (%)</th>
<th>Cases Severe Frequency (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20 yrs</td>
<td>24 (48%)</td>
<td>30 (60%)</td>
<td>28 (56%)</td>
<td>16 (32%)</td>
<td>0.132</td>
</tr>
<tr>
<td>21-25 yrs</td>
<td>15 (30%)</td>
<td>8 (16%)</td>
<td>9 (18%)</td>
<td>14 (28.0%)</td>
<td></td>
</tr>
<tr>
<td>26-30 yrs</td>
<td>6 (12%)</td>
<td>8 (16%)</td>
<td>11 (22%)</td>
<td>14 (28.0%)</td>
<td></td>
</tr>
<tr>
<td>30-35 yrs</td>
<td>5 (10%)</td>
<td>4 (8%)</td>
<td>2 (4%)</td>
<td>6 (12.0%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 (100%)</td>
<td>50 (100%)</td>
<td>50 (100%)</td>
<td>50 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Females in the age group of 15-35 years were included in this study. The distribution of age group in case and control is shown in Table 2 and Graph 2. The differences in age between cases and control was statistically not found to be significant (P =0.132)

**Table 3: Comparison of age distribution in control and, mild, moderate and severe cases**

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Cases Mild</th>
<th>Cases Moderate</th>
<th>Cases Severe</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>22.20 ± 4.94</td>
<td>22.78 ± 5.62</td>
<td>22.28 ± 4.77</td>
<td>23.86 ± 5.18</td>
<td>0.347</td>
</tr>
</tbody>
</table>
The mean age of control and cases (mild, moderate and severe acne) is as shown in Table-3 and Graph-3. Differences in average age between cases and control was statistically not found to be significant (P =0.347).

### Table 4: Correlation of age distribution in control and, mild, moderate and severe cases

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>Std. Error</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Mild</td>
<td>-0.1</td>
<td>0.419</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>-0.98</td>
<td>0.546</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>-5.200*</td>
<td>0.703</td>
</tr>
<tr>
<td>Mild</td>
<td>Moderate</td>
<td>-0.88</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>-5.100*</td>
<td>0.721</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>-4.220*</td>
<td>0.802</td>
</tr>
</tbody>
</table>

There exist a significant correlation between control and severe, mild and severe and moderate and severe. (P value <0.001), thereby suggesting that cases of severe acne occur in older age group as compared to those with mild and moderate acne.

### Table 5: Mean and Standard Deviation of the Insulin in Controls, Mild, Moderate and Severe Acne Vulgaris

<table>
<thead>
<tr>
<th>Insulin (µIU/mL)</th>
<th>Control Mean ± SD</th>
<th>Cases Mild Mean ± SD</th>
<th>Cases Moderate Mean ± SD</th>
<th>Cases Severe Mean ± SD</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15.63 ± 8.36</td>
<td>17.74 ± 7.67</td>
<td>20.11 ± 9.30</td>
<td>15.07 ± 7.85</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td>16.25</td>
<td>17.00</td>
<td>22.20</td>
<td>13.86</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.01 - 34.50</td>
<td>4.60 - 30.50</td>
<td>3.30 - 38.30</td>
<td>3.03 - 36.38</td>
<td></td>
</tr>
</tbody>
</table>

The value of insulin in cases and controls is as shown in Table13 and Graph 9. Insulin was found statistically significant lower (P=0.017) in control group as compared to cases of study group (mild, moderate and severe).

### Table 6: Correlation of cases with each other and control in comparison to Insulin

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>Std. Error</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Mild</td>
<td>-2.1044</td>
<td>1.60475</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>-4.4784</td>
<td>1.76845</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>0.55944</td>
<td>1.62233</td>
</tr>
<tr>
<td>Mild</td>
<td>Moderate</td>
<td>-2.374</td>
<td>1.70487</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>2.66384</td>
<td>1.55277</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>5.03784*</td>
<td>1.72143</td>
</tr>
</tbody>
</table>

The difference of mean value of insulin was found to be significantly higher in moderate (P< 0.016) cases as compared to control and moderate with severe cases (P< 0.004). The mean values of serum insulin (fasting) were also found higher in mild acne (Mean ± SD 17.74 ± 7.67, P=0.196) as compared to controls (Mean ± SD 15.63 ± 8.36). However the difference was not found statistically significant (P= 0.196).

**Discussion**

Acne vulgaris is a common skin disease, affecting more than 85% of adolescents, women being affected more frequently than men. It is seen in nearly 100% of individuals at some time during their lives. Although it does not affect overall health, its impact on emotional well-being and function can be critical, especially active acne and its sequel, like permanent scarring, leaves psychological stress that do not always correlate with the clinician’s assessment of severity at one point in time. Our group I, I1, and I12 comprised of patients of Mild, Moderate and Severe Acne Vulgaris. Group IV consisted of healthy controls.

The age of the patients ranged from 15 to 35 years with 50(100%) of mild acne, 50(100%) of moderate acne and 50(100%) of severe acne and 50(100%) of control healthy.
In the present study, acne seems to be mostly found in 15-20 years of age group i.e 41(82%) cases of mild acne, 35 (70%) cases of moderate acnes and 10 (20%) cases of severe acne whereas 33 (60%) cases of control group. Only 6 (12%) cases have severe acne between 31 to 35 years of age group. This fact can be appreciated in Graph 2. The severe acne was found significantly in higher age group as compared to mild and moderate acne.

The mean values for age did not show significant variation in case when compared with control group and within the cases which is further supported by the work of Bassi et al. Rahman et al. and Rahman et al. who revealed that the mean values for age did not very much in obese and non-obese females with acne vulgaris when compared with control group.

**Insulin**

In the present study, the level of serum insulin was significantly higher in moderate cases of acne as compared to controls. Therefore we suggest that insulin may also play an important marker for causing acne. Insulin stimulates the secretion of ovarian estrogen, androgen and progesterone which is consistent with our studies as increase in estrogen and testosterone has been also observed in moderate cases of acne.

The work of Emiroglu et al. found that insulin resistance may have a role in the pathogenesis of acne and there exists a positive correlation between insulin resistance and severe acne vulgaris.

Shabir et al. observed that the serum fasting insulin was elevated in index patients and their family members and found a heritable component of β-cell dysfunction in the families of women with PCOS, which is likely to be a significant factor for the predisposition of metabolic syndrome in these families.

Pace insisted that Insulin resistance has been found to be a major component of PCOS; interaction can occur whereby hyperinsulinemia can promote hyperandrogenism and possibly also vice-versa.

**Conclusion**

Acne Vulgaris is mainly diseases of adolescent age where as severe acne is likely to be found in higher age group.

Level of LH, estradiol, testosterone and insulin may be studied in cases resistant to conventional treatment of acne in women and in those with history and clinical features suggestive of PCOD or hyperandrogenism and in obese women with acne. Any hormonal imbalance found may be correlated to help management of such cases.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCES**


Seminars in cutaneous medicine and surgery; 2008: Frontline Medical Communications.


Espousing Artificial Intelligence for Cataloguing of Tumors in the Brain

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ABSTRACT

Despite advantages in computer vision and machine learning its application in classification of Brain tumors and achieving optimal results is yet remains a challenge. The tumors appear at any location in the brain by nature and the tumors have any kind of dimensions, contour and contrast. This sources the motivation of our investigation of machine learning that adventures a high capacity deep learning algorithm being enormously effectual.

Deep learning has been used successfully in supervised classification tasks in order to learn complex patterns. The purpose of this research is to implement the machine learning technique to classify the tumors in the brain, with different classes of tumors such as benign and malignant. Training neural networks over the dataset is taken from the open f-MRI. There are 120 MRI datasets that are released to the public along as part of the materials for “Temporal interpolation alters motion in fMRI scans: magnitude and consequence for artifacts detection” Included for each subject is a T1-weighted anatomical image (MP-RAGE) and one or more T2 weighted scans (resting BOLD scans), legacy.openfmri.org. Every subject’s MRI is then split into 2D slices from the entire axis to increase the data volume, and then these images are preprocessed and fed into a 2D-CNN network. It is then trained for number of epoch cycle for a better processing speed and the resulted output of the weighted and biases are stored for the model to predict future inputs this has verified to be precise in its classifications with an average five-fold cross validation of 91.43%.

Keywords: Deep Neural Network, Convolutional Neural Network, Artificial Intelligence, RELU, Max-pooling, Connected layers, Hyper parameters, Sigmoid accuracy

Introduction

About Brain Tumors: Brain is one of the supreme and delicate organ of human body; it functions as the coordinating center of intellectual, nervous activities and center of sensation. One of the most formidable diseases of mankind is the Brain tumor. The two major classes of tumor are primary brain tumors and secondary brain tumors. They are also known as low grade (Benign) and high grade (Malignant) tumors[1]. The tumor that origin within the brain and does not extent in other parts of the body are called the Primary brain tumors they are less aggressive whereas the tumors that are generated by cancer cells that rove from the tumors developed in other places are known as secondary tumors[2]. One of the significant clinical difficulty in brain metastatic management is the limitations of diagnosis due to ambiguity in imaging for identification of the etiology of contrast – enhancing lesions viewed on Magnetic Resonance Images (MRI) to plan treatment stratagem.

Imaging the Brain: Ever since the invention of the Magnetic resonance imaging in the 1980’s the MRI is been useful to perform imaging of the brain [3]. Magnetic resonant images are obtained from various sequences like the T1, T2, Fluid Attenuation Inversion Recovery (FLAIR) and the Diffusion Weighted Images (DWI), where these sequences provide texture and intensity information of the brain tumors[4][5].

Computer aided diagnosis: With the progress of technology many new trends come forward to give better results and maximum efficiency. Machine learning and Artificial intelligence is one of the state-of-the-art trends in computer aided diagnosis, it is also one of the most widespread scientific research trends these days.

The objective about this work is to cultivate a system for the radiologist to support them in classification of the tumors. Computer vision allows us to make broad use of medical imaging to provide better diagnosis, predication
and treatment for patients suffering from health disorders. Computer vision can exploit shape, texture, delineation and prior knowledge along with appropriate information from image sequence which are helpful for better understanding. Many dominant tools have to be developed through machine learning where quantitative information can be obtained.

The First generation Artificial Neural Network (ANN) composed of neural layers for perceptron but these were limited to simple computations and suffered high error rates, to overcome this limitation the back propagation technique were been used to update weights of neurons according to the error rates [6]. As research continued in this fields with more and various applications other techniques like the Feed forward Neural Network (FNN), the Recurrent Neural network (RNN) along with Deep belief network etc. got popular as the complexity in research gained success in different ways and purposes.

Deep learning is a multilayer, nonlinear repetition of simple architectures that helps to obtain output for high complex functions, Deep learning gained success in both the Supervised and the Unsupervised learning [7]. It was in the mid 1980’s the term deep learning was introduced to the concept of machine learning [8], here the features of the data are learnt by multiple layers of deep learning with multiple levels of abstraction [6]. The hierarchy of features is formed at different levels and the higher levels are well-defined from lower levels which in turn help in building many more higher levels [8]. The structure of deep learning is extended from the traditional neural network by adding more no of hidden layers.

Convolutional Neural Network (CNN): The CNN tries to imitate how the visual cortex of the brain recognizes images. To get better results with image classification image, feature extraction should be used [9]. Before CNNs existed, these feature extractors were designed by experts in each field of the images to be classified. However, with CNNs the feature extractor is involved in the training process.

The data set is normalized using Equation (1),

\[ Z = \frac{X - \mu}{\sigma} \]  

... (1)

Here X signifies the dataset features and \( \mu \) represents the mean value of each dataset feature. The feature extractors consist of several convolutional layers and pooling layers. The convolutional layer can be seen as a digital filter. The pooling layer reduces the dimension of the image by combining neighboring pixels into a single pixel [9]. CNN is the reasons for advances in image recognition. LeNet5 set that has now has become standard structure for CNN. The structure has stacked convolutional layers, which can be followed by contrast normalization and max-pooling layers, as shown in Fig 1. These are then followed by fully-connected layer(s). Compared to feed-forward network with similarly sized layers a CNN has fewer parameters and connections. This makes them easier to train, but theoretically their best performance is somewhat less than a feed-forward network. CNNs are computational heavy when applied on a large scale over high resolution images, but with the GPUs since 2012 and optimized versions of 2D convolution it is possible to do this with reasonable computational resources [10].

Structure of CNN: The CNN consist of multiple convolutional layers and between each consecutive convolutional layer there is a subsampling layers. Initially the kernel convolve the input image with the help of addable bias vectors. The feature maps are generated in the first convolutional layer and new feature maps are obtained by weighing and averaging the localized regions in the sub layer through a nonlinear activation function. The newly obtained feature maps are then convoluted with the trained filters of the next convolutional layer which are then fed to the next sub layer, this process continues till the final sub layer to obtain a feature vector which is given as an input to a traditional neural network for training [11].

![Fig. 1: Architecture of CNN](image-url)
**Deep Neural Network (DNN):** A Neural Network with multiple hidden layers is a deep neural network. The idea of DNN has been around for many years, but it is only recently that many of the problems associated with the technique have been solved. This is mainly because of new learning algorithms and an increase of compute power. The main problems for multilayer networks were: vanishing gradient, over fitting and computational load. Simplest way to improve a DNN is by increasing its size in both depth and width, but this simple solution comes with two drawbacks. Increased size will make the networks more prone to over fitting and it will also greatly increase the computer power required, which can be resolved by using Global processing units (GPU).

The Rectified Linear Unit (ReLU) acts as an activation function in each hidden layer, also used as a classifier in the final layer of the network.

**Methodology**

**Dataset:** The images used here come from multiple different open access sources; here we have taken 385x150 = 57,750 sequences of training data and 85x150 = 12,750 testing data which includes the T1, T2, DWI sequences. The taxonomy was then averaged to partition the individual diseases into training classes. This generated training classes with diseases that are clinically and visually similar since all training classes are descendants of the root nodes. Each training class was ensured to have a number of images so that the CNN would have sufficient training data for each class.

Convolutional neural networks have a high number of learnable parameters; the cutting edge neural networks have millions of learnable parameters relying on a large number of images in order to train the system. This can often happen due to small datasets. We applied several methods that prevent over-fitting including data augmentation, regularization through dropout, and parameter sharing implied through rotations and transformations of images mentioned below.

1. **Rotation:** Images were rotated with an angle between 0° and 360° that was randomly taken from a normal distribution.

2. **Shift:** Images were randomly shifted -4 to 4 pixels left or right and up or down. These minor shifts were taken from a normal distribute and kept brains in the center of the image but changed the location of the brains enough to avoid memorization of location in an image rather than relative to the brain itself.

3. **Scaling:** Images were randomly rescaled using the scaling between 1.3–1.4. Mirror: Each image was mirrored across its y-axis (horizontally) with a probability of 0.5. After these initial transformations, further augmentation was performed in order to increase the size of the training set each round. Each image was rotated 0° and 45° and flipped horizontally to create four images. These four images were cropped to a size of 45 x 45 taking the four corners of the images as edges to produce 16 different images. The above data augmentation was run on the training data every epoch of training in order to constantly introduce new images to the neural network every iteration. This augmentation affected training time very little.

This neural network represents taking only images as input. While many combinations of layers were tested, the best combination for this neural network was the following:

- Convolutional Layer of filters(64) with size 5x5 and stride = 1
- Max-pooling Layer with pool and stride of size 2 x 2
- Convolutional Layer with 64 filters of size 5 x 5 and stride of 1
- Max-pooling Layer with pool and stride of size 2 x 2
- Fully Connected Layer with 800 neurons
- Fully Connected Layer with 800 neurons
- Softmax Layer with 3 or 4 neurons depending on brain tumor only in training or tumor less brain inclusion in training respectively.

The softmax function postulates a discrete probability distribution given by

\[ \sum_{k=1}^{K} P_k \]  

...(2)

Each layer besides max-pooling applied the nonlinearity ReLU, and last three layers applied
dropout to help in regularization and over-fitting. [export.arxiv.org]

This neural network provides more information than one image input. There are two version of the neural network. Each version has a neural network synonymous to CNN from above. However, a second input layer exists representing the same image input or the maximum and minimum x and y to represent the location of the tumor. If we consider x as activation second last (penultimate) layer and $\theta$ is the weight parameter at the softmax layer we get as the input to the softmax layer:

$$\sigma = \sum_{i=1}^{n} \theta_i x_i \quad \ldots (3)$$

therefore $P_k = \frac{\exp(\sigma_k)}{\sum_{i=1}^{n} \exp(\sigma_i)} \quad \ldots (4)$

Hence the predictive class is $\hat{y} = \arg\max\ pi$ for $i = 1, \ldots N$

These have their own neural network path that eventually concatenates with the CNN from before. This second neural network path consists of the following layers:

- Fully Connected Layer with 800 neurons
- Fully Connected Layer with 800 neurons

The last layer of and the fully connected layer from CNN were concatenated together and connected to one last fully connected layer with 800 neurons before reaching the softmax layer. The patients data were randomly placed into three sets for training, validation, and test with 149, 21, and 21 patients respectively. A patient represents all of a patients images; this avoids mixing patient data in both training and test which allows for easier predictions since patient images are similar in structure. The mean picture from training was subtracted from the train, the validation, and the test in order to centralize the data.

Training data was used throughout the training of the neural networks the train data was used for updating weights while validation data gave a glimpse into how the neural network was improving over time. After completion, the test data was used to see how well the neural networks predicted types of tumors from new images. A variety of hyper parameters are available to alter. We list the hyper parameters that produced the highest accuracies.

**Data Analysis**

- Regularization constant: 0.014
- Learning rate: 0.0001 • Momentum constant: 0.9
- Batch size: 4 for non-augmented datasets, 128 for augmented datasets
- Epochs: 100 (and one 500) which was compensation between accuracy and training time

Rather than maintain a constant learning rate, a decaying learning rate was attempted in order to increase accuracies by decreasing the learning rate over time. However, each case of the decaying learning rate had significantly worse accuracies than without them.

**Performance Elevation/Findings:** The exploration in this study is carried out on a laptop with Intel CORE i5 processor and NVIDIA GeForce 960M 4GB Ram, Table 1 displays the results of the construction of the CNN. The last layer dense_2, used the softmax classifier and the ReLU classifier coding done in python (open source software) using the Jupyter note book, numpy.

**Table 1: Construction for CNN**

<table>
<thead>
<tr>
<th>Layer (type)</th>
<th>Output Shape</th>
<th>Param #</th>
</tr>
</thead>
<tbody>
<tr>
<td>conv2d_1</td>
<td>(Conv2D) (None, 62, 62, 32)</td>
<td>896</td>
</tr>
<tr>
<td>max_pooling2d_1</td>
<td>(MaxPooling2 (None, 31, 31, 32)</td>
<td>0</td>
</tr>
<tr>
<td>conv2d_2</td>
<td>(Conv2D) (None, 29, 29, 32)</td>
<td>9248</td>
</tr>
<tr>
<td>max_pooling2d_2</td>
<td>(MaxPooling2 (None, 14, 14, 32)</td>
<td>0</td>
</tr>
<tr>
<td>flatten_1</td>
<td>(Flatten) (None, 6272)</td>
<td>0</td>
</tr>
<tr>
<td>dense_1 (Dense)</td>
<td>(None, 128)</td>
<td>802944</td>
</tr>
<tr>
<td>dense_2 (Dense)</td>
<td>(None, 1)</td>
<td>129</td>
</tr>
</tbody>
</table>

Total params: 813,217
Trainable params: 813,217
Non-trainable params: 0
Table 2: Testing accuracy with respect to ReLU and Sigmoid

<table>
<thead>
<tr>
<th>No of Epochs</th>
<th>RELU Accuracy</th>
<th>RELU Time</th>
<th>Sigmoid Accuracy</th>
<th>Sigmoid Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>81.08</td>
<td>8.21</td>
<td>49.69</td>
<td>10.12</td>
</tr>
<tr>
<td>80</td>
<td>79.65</td>
<td>10.45</td>
<td>49.65</td>
<td>12.15</td>
</tr>
<tr>
<td>70</td>
<td>78.77</td>
<td>12.56</td>
<td>49.40</td>
<td>14.14</td>
</tr>
<tr>
<td>60</td>
<td>79.46</td>
<td>14.78</td>
<td>49.52</td>
<td>16.15</td>
</tr>
<tr>
<td>50</td>
<td>77.76</td>
<td>16.98</td>
<td>49.52</td>
<td>18.16</td>
</tr>
</tbody>
</table>

**Conclusion**

In computer vision the state of the art is the Convolutional neural networks further introducing them into the medical field could greatly improve current practices of diagnosing patients. Training convolutional neural networks to detect types of tumors in brain images improves classification accuracy and provides initial steps into introducing deep learning into medicine. Neural networks also utilize a more general
methodology requiring only an image to understand brain tumor types. Furthermore, the accuracy per patient metric consistently remained at the levels of per image accuracy results, implying the neural network is providing consistent predictions for patient images.

**Ethical Clearance:** The data base used and implemented in this paper is taken from internet source available for research and does not contain any patient name and identity.

**Source of Funding:** The database used is taken from legacy.openfmri.org internet source.

**Conflict of Interest:** Nil.

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Impact of Maternal Obesity on Perinatal Complications

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ABSTRACT

Introduction: Obesity during pregnancy is one of the important risk factors for development of complications. This study is conducted to assess the association of body mass index with maternal complications in pregnancy.

Method: This was an observational study conducted retrospectively over a year comprised 300 pregnant subjects in second trimester. Incidence of gestational diabetes mellitus (GDM), pregnancy induced hypertension (PIH), Caesarean section and postoperative wound infection were compared in women with various Body Mass index (BMI). Analysis of the data was done using SPSS version 13 using chi square test and p ≤ 0.05 was considered statistically significant.

Results: Out of 300 participants, 62 (20.7%) subjects developed GDM out of which 88.7% were overweight/obese. 61 (20.3%) subjects developed PIH, out of which about 91.8% were overweight/obese. 162 (54%) subjects underwent C-section out of which 67 (41.4%) were in overweight/obese category. 82 subjects developed post-operative wound infection in which 41 (50%) cases were in overweight/obese category.

Conclusion: Normal body mass index at the time of incidence of pregnancy and proper antenatal care and careful monitoring of the maternal body weight can minimize the complications to a large extent. Obstetrician-gynaecologists could play a prime position to prevent it.

Keywords: Body mass index, Gestational Diabetes Mellitus, Pregnancy induced Hypertension, Caesarean section, Postoperative wound infection, Perinatal complications.
Obesity is a major contributor to the global burden of chronic disease and disability and has reached epidemic proportions globally with more than a billion adults being over-weight. The changing lifestyle has increased the prevalence of obesity worldwide including the women trying to become pregnant. It is now well recognized that maternal obesity during pregnancy increases the risks of complications for the mother and newborn. Adequate gestational weight-gain contributes for better pregnancy outcomes in both mother and infants for short and long-term health. Recognition of the importance of adequate weight gain during pregnancy has brought to light the lack of guidelines to establish proper weight gain during gestation. This study is conducted to assess the incidence and its possible association of BMI with maternal outcome of pregnancy.

Material and Method

This was an observational study conducted retrospectively in one year period with follow up being done for a period of 6 months post-delivery. 300 pregnant subjects in second trimester regularly attending the antenatal clinic at a tertiary health care center, Mangalore were taken in this study. Women in their second trimester and singleton pregnancy were selected. Women with multiple pregnancies and Pre-pregnancy complications like diabetes-mellitus, hypertension, cardiovascular and kidney diseases were excluded from the study. The study was approved by the Institutional Ethical committee (IEC), Kasturba Medical College (KMC), Mangalore, Manipal Academy of Higher Education (MAHE), Manipal, Karnataka, India. Prior permission was obtained from the hospital authority; all the pregnant subjects were briefed about the nature and purpose of the study, following which a written informed consent was taken. The study involved determination of height at the initial visit, weight at two separate occasions prior to the commencement of pregnancy and again during the second trimester. Body Mass index (BMI) was calculated and normal, underweight, overweight and obese groups were categorized based on their BMI.

Screening for GDM was conducted at (24-28) weeks of gestation using a 50 gram glucose test. After one hour of glucose intake blood sugar was measured. Levels >140 mg/dL were considered significant and diabetes confirmed on Glucose Tolerance Test (GTT). Pregnancy induced hypertension (PIH) was defined as persistently elevated blood pressure, systolic pressure >140 mm Hg and diastolic pressure > 90 mm Hg on more than two occasions with proteinuria or edema or both. Caesarean delivery defined as the birth of a foetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy). Post-operative wound infection could be either due to C-section or due to that of episiotomy.

**Statistical Analysis:** Analysis of the data was done using SPSS version 13, chi square test was done and $p \leq 0.05$ was considered statistically significant.

**Result**

**Table 1: Relationship of BMI with gestational diabetes mellitus**

<table>
<thead>
<tr>
<th>Gestational diabetes mellitus (GDM)</th>
<th>Group (BMI)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Absent</td>
<td>115</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>48.3%</td>
<td>44.1%</td>
</tr>
<tr>
<td></td>
<td>99.1%</td>
<td>94.6%</td>
</tr>
<tr>
<td>Present</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>1.6%</td>
<td>9.7%</td>
</tr>
<tr>
<td></td>
<td>0.9%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>38.7%</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

$x^2=177.180$ ***$p=.000$ (HS)

In the present study out of 300 subjects, 62 (20.7%) subjects developed gestational diabetes mellitus. Out of these 62, 1.6% were in the underweight category, 88.7% were in the overweight/obese category (Table 1).

**Table 2: Relationship of BMI with pregnancy induced hypertension**

<table>
<thead>
<tr>
<th>Pregnancy induced hypertension (PIH)</th>
<th>Group (BMI)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Absent</td>
<td>116</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>48.5%</td>
<td>44.4%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>95.5%</td>
</tr>
<tr>
<td>Present</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>8.2%</td>
<td>72.1%</td>
</tr>
<tr>
<td></td>
<td>4.5%</td>
<td>72.1%</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>38.7%</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

$x^2=194.826$ ***$p=.000$ (HS)
Further, 61 (20.3%) about 91.8% developed pregnancy induced hypertension in the overweight/obese category, with numbers being insignificant in the control group and nil cases being reported in the underweight BMI group (Table 2).

Table 3: Relationship of BMI with C-Section

<table>
<thead>
<tr>
<th>Caesarean Section (C-section)</th>
<th>Group (BMI)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Absent</td>
<td>64</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>46.4%</td>
<td>49.3%</td>
</tr>
<tr>
<td></td>
<td>55.2%</td>
<td>61.3%</td>
</tr>
<tr>
<td>Present</td>
<td>52</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>32.1%</td>
<td>26.5%</td>
</tr>
<tr>
<td></td>
<td>44.8%</td>
<td>38.7%</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>38.7%</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

$x^2$=56.675 ***p=.000 (HS)

162 (54%) cases had a C-section. Out of these 162, about 41.4% were in the overweight/obese category, and 32.1% were in the underweight group (Table 3).

Table 4: Relationship of BMI with postoperative wound infection

<table>
<thead>
<tr>
<th>Postoperative wound infection</th>
<th>Group (BMI)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Absent</td>
<td>90</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>41.3%</td>
<td>44%</td>
</tr>
<tr>
<td></td>
<td>77.6%</td>
<td>86.5%</td>
</tr>
<tr>
<td>Present</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>31.7%</td>
<td>18.3%</td>
</tr>
<tr>
<td></td>
<td>22.4%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>38.7%</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

$x^2$=47.974 ***p=.000 (HS)

82 (27.3%) cases developed a postoperative wound infection. Out of these 82, about 50% were in the overweight/obese category and 31.7% were in the underweight group (Table 4).

Discussion

Gestation induced diabetes could be linked to a chain of exaggerated physiological changes that are known to occur in glucose metabolism. Another possible explanation is, gestation induced diabetes is very often type 2 diabetes which is unmasked by diabetogenic factors such as obesity, and known to aggravate by both pregnancy and impending insulinopenia. These findings of our study have been consistent with studies conducted by Catalano and associates who compared the endogenous glucose production, insulin response and changes in insulin sensitivity in subjects who had normal glucose tolerance with changes identified in subjects with gestation induced diabetes with the latter subjects having abnormal glucose metabolism that were characteristic of type 2 diabetes 10. The reason why obese women are at higher risk of developing GDM is likely to be related to a progressively increasing insulin resistance due to the continuous production of counter-regulatory, anti-insulin hormones by the growing placenta, which results in increased availability of lipids for fetal growth and development. No significant associations of GDM in our study were found in the underweight and control group.

Obesity which is regarded the most consistent risk factor for pregnancy induced hypertension, also had a highly significant association with BMI in our study population. These finding were similar to the studies conducted by Cedereng, Jensen, Sebire, Weiss and their colleagues who showed a strong correlation with maternal overweight and obesity in causing undesirable pregnancy outcomes particularly PIH11,12. A review of studies conducted by O’Brien and associates found that for every 5-7 kg/m² increase in prepregnancy BMI the occurrence of preeclampsia doubled 13. The pathophysiology of obesity, in causing PIH, can be linked to, the presence of low-grade inflammation and endothelial activation which would play a dominant role in causing the disease. Studies conducted by Wolf and co-workers have provided interesting evidence which might explain this inflammation in being associated with obesity and preeclampsia 14. The present study, however did not show any significance of PIH in the underweight and control subjects.

The present study had higher rates of caesarean section (CS) among the overweight/obese women, thus making the relationship between high maternal BMI and CS highly significant. These findings have been similar
to studies conducted by Barau et al who also described a linear association between maternal pre-pregnancy BMI and caesarean section particularly in term deliveries. Several studies have found an association between increased risk of CS following labour induction and high maternal BMI. In another study, obese and overweight women not only accounted for almost 20% of all post-term pregnancies and 45% of all CS following labour induction, in addition to adverse maternal and foetal outcome. Obesity is an independent risk factor for failed trial of labour after previous caesarean and also emergency C-section. Possible reasons for increased abdominal deliveries in case of obese patients could be cephalopelvic disproportion, failure to progress, intra-uterine growth restriction presenting as fetal distress or simply excess of fat deposition in the maternal pelvis. Studies have also postulated that leptin may exert a physiologic inhibitory effect on uterine contractility, leading to dysfunctional labour and increased operative delivery. The below normal group also had high percentage for CS compared to that of normal body weight group.

Post-operative wound infection, a bacterial infection is well known to occur in the obese and particularly who have had a caesarean section irrespective of whether it is an elective or emergency type, with or without coverage of prophylactic antibiotic. In this study, out of the subjects, who developed postoperative wound infections, about 50% were in the overweight/obese category and 18.3% were in the control group. The risk factors attributable in our study population includes pre-existing diabetes with concomitant immuno-suppression due to long term treatment of corticosteroids, previous history of C-section delivery, prolonged labour, prolonged operative period, poor hemostasis due to increase in the thickness of the subcutaneous tissue, lack of pre-incision antimicrobial care and hematoma formation. Hyperglycemia, however as such is known to cause a decrease in the cytokine expression by delaying re-epithelialization and enhancing the risks for wound infection.

**Conclusion**

Increased body mass index has been a potent risk factor for the perinatal complications. This has been well supported by evidences obtained in this study. Obesity is increasing in alarming rate and is the most important modifiable risk factor for development of pre and post-natal complications. Therefore, our study stresses that normal body mass index at the time of incidence of pregnancy and proper antenatal care and careful monitoring of the maternal body weight can minimize the complications to a large extent. Creating awareness programmes about obesity related maternal complication could be helpful to the society Obstetrician-gynaecologists could play a prime position to prevent it.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCE**

implications for policy and intervention strategies.  
2004;157–63.


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Static Balance and Dynamic Balance in Obese School Going Children Between 11 and 14 Years of Age: A Cross Sectional Study

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ABSTRACT

Background: Childhood obesity is an epidemic. Childhood obesity leads to decreased balance.

Objective: The objective of the study is to determine the relationship between obesity and Static and Dynamic balance in school children aged 11 to 14 years.

Materials and Method: 100 school children between 11 and 14 years from the schools in Thiruvananthapuram city were included in the study using simple random sampling method. Students with musculoskeletal impairments, cardio respiratory disorders, neurological impairments and general weakness were excluded from the study. BMI percentile has been calculated for all the students. Stork balance stand test was used to measure the static balance. Modified Star Excursion Balance Test was used to measure the static and dynamic balance. The result of the study shows that there is a significant negative correlation between Body Mass Index and static and dynamic balance.

Conclusion: The result of the study shows that there is a significant negative correlation among Body Mass Index and static and dynamic balance. Thus the study concludes that obese school going children are having less static and dynamic balance.

Keywords: Childhood Obesity, Body Mass Index, Static balance, Dynamic balance.

Introduction

Childhood obesity is one among the most crucial health challenges the society is facing. Obesity is defined as “the excessive fat accumulation that presents a risk to health” (WHO). When the body weight is increased, it becomes much harder to shift the body weight and move from one place to another. Urbanization and digitalization of the society makes the children to involve more in indoor activities such as using smart mobile phones, social medias etc. In the ancient times, children go to school by walking, cycling etc. But nowadays majority of the children living in urban area are utilizing the transport facilities for going to school. More concentration on the academic activities and fear of the parents concerning the safety of their children force the children to spend most of the time indoor and live a passive lifestyle. Obesity in the childhood is the main source of non communicable diseases such as cardiovascular diseases and diabetes, musculoskeletal disorders etc in the adulthood. Obesity is associated with an increased risk of falls and subsequent injury. Excessive body weight increases the stress within the bones, joints and soft tissues resulting in abnormal musculoskeletal mechanics and function such as impaired balance, gait, strength, sensory function, neuromuscular function which ultimately leads to fall. Obesity alters the normal gait pattern. Obesity reduces the walking speed, cadence, step length; increased stance phase and double leg support duration. These gait

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abnormalities represent the impairment of balance and result in abnormal musculoskeletal function, exhaustion and frequent falls. Balance is a state of equilibrium in which the sum of all internal and external forces acting on the body is zero. The ability of the body to maintain the balance in a certain static position is known as static balance and the ability of the body to maintain the balance during certain movement of dynamic posture is known as dynamic balance. Body Mass Index is a main determinant of performance of static and dynamic balance tests. Obesity increases the demand on the attention to maintain the balance and postural stability, hence when the obese individuals do multi task activities in their daily life the balance is disturbed. The purpose of the present study is to find out the relationship between Obesity and static and dynamic balance in obese school going children aged between 11 and 14 years.

Materials and Method

100 school children between 11 and 14 years from the schools in Thiruvananthapuram city were included in the study using simple random sampling method. Students with musculoskeletal impairments, history of lower extremity injury for the past 6 months, history of any surgery in the lower limb, cardio respiratory disorders, neurological impairments, general weakness, mentally retarded, were excluded from the study. BMI percentile has been calculated for all the students. They were divided into three BMI categories. i.e., Normal weight, Overweight and Obese. Stork balance stand test was used to measure the static balance. The subjects were asked to stand on the foot of the one leg and to place the ball of the foot of the other leg on the inner side of the supporting leg knee with the thigh rotated outward. The subjects were instructed to place the hands on the hip. The subjects were informed to stand on the ball of the foot by raising the heel from the floor. The stop watch was started as the subject raises the heel from the floor to maintain the balance as long as possible without moving the ball of the foot from the initial position. The stop watch was stopped as soon as the subject loses the balance by touching heel to the floor, the non supporting foot looses contact with the knee, the supporting foot moves in any direction, the hand(s) come off the hips. The total time in seconds were recorded. The best of the three trials was recorded. The procedure was repeated on the other leg. Modified Star Excursion Balance Test (SEBT) was used to measure the dynamic balance. The Modified Star Excursion Balance test directions were constructed by affixing three tape measures with a centimetre scale on the floor. The first reach direction was aligned anterior to the apex; the other two were oriented 135° to the first in the posteromedial and posterolateral directions. The subject’s starting foot was placed on the convergence of the reach directional lines of Y. The lateral malleolus was positioned at the intersection point of the three directions with the foot’s longitudinal axis oriented at the anterior direction. The starting position was bilateral stand. Subjects stood barefoot with their hands on their hips. Maintaining single leg stance, they were instructed to reach as far as possible with the non-stance leg along the marked tape, point to the most distal portion with their great toe and return their limb back to the starting position. The maximum reach distance was recorded. Subjects practiced each direction 4 times before the main test to minimise the learning effect. This was followed by recording of 3 successful trials of maximum reach distance in each direction for both legs, with 10 seconds rest between each test. The leg length of the subjects were measured from anterior superior iliac spine to the medial malleolus for normalization, the mean reach distance of 3 trials was divided by limb length(cm) and multiplied by hundred for a percentage score. The composite reach distance was calculated by using the sum of three normalized reach distances divided by 3 times the limb length, multiplied by 100. The results were recorded and statistically analyzed.

Statistical Analysis

The result was analyzed using SPSS software version 16. The statistical tool used was pearson correlation.

Results

Table 1: Correlation among Body Mass Index and Stork Balance Test score of right and left side

<table>
<thead>
<tr>
<th>Stork Balance Test</th>
<th>BMI PERCENT</th>
<th>Pearson Correlation</th>
<th>Stork Balance Test (Right side)</th>
<th>Stork Balance Test (Left side)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>1</td>
<td>-.931**</td>
<td>-.930**</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
Conted...

<table>
<thead>
<tr>
<th>Stork Balance Test (Right side)</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.931**</td>
<td>.000</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stork Balance Test (Left side)</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.930**</td>
<td>.000</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2: Correlation among Body Mass Index and Anterior Reach distance Right and Left

<table>
<thead>
<tr>
<th>Modified SEBT</th>
<th>BMI</th>
<th>Anterior Reach Right</th>
<th>Anterior Reach Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.811**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Anterior Reach Right</td>
<td>Pearson Correlation</td>
<td>-.811**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Anterior Reach Left</td>
<td>Pearson Correlation</td>
<td>-.860**</td>
<td>.944**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3: Correlation among Body Mass Index and Postero-medial Reach distance Right and Left

<table>
<thead>
<tr>
<th>Modified SEBT</th>
<th>BMI</th>
<th>Postero-medial Reach Right</th>
<th>Postero-medial Reach Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.735**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Postero-medial Reach Right</td>
<td>Pearson Correlation</td>
<td>-.735**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Postero-medial Reach Left</td>
<td>Pearson Correlation</td>
<td>-.730**</td>
<td>.933**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4: Correlation among Body Mass Index and Postero-lateral Reach distance Right and Left

<table>
<thead>
<tr>
<th>Modified SEBT</th>
<th>BMI</th>
<th>Postero-lateral Reach Right</th>
<th>Postero-lateral Reach Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.805**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>1</th>
<th>.952*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postero-lateral Reach Right</td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>.952*</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postero-lateral Reach Left</td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

**Table 5: Correlation among Body Mass Index and Composite Reach distance Right and Left**

<table>
<thead>
<tr>
<th>Modified SEBT</th>
<th>BMI</th>
<th>Composite Reach Right</th>
<th>Composite Reach Left</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td>-.836**</td>
<td>-.824**</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Composite Reach Right</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.836**</td>
<td>1</td>
<td>.965**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Composite Reach Left</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.824**</td>
<td>.965**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

**Discussion**

100 school children between 11 and 14 years from the schools in Thiruvananthapuram city were included in the study using simple random sampling method. BMI percentile has been calculated for all the students. They were divided into three BMI categories, i.e., Normal weight, Overweight and Obese. The Stork Balance Stand Test was used to measure the static balance and the Modified Star Excursion Balance Test was used to measure the dynamic balance. The Pearson correlation for Stork Balance Test of Right side was -.931 and that of left side was -.930, P value was .000 which shows that there is a significant correlation at 0.01 level among Body Mass Index and Stork Balance Test score of right and left side. The Pearson correlation for right side anterior reach was -.811 and that of left side was -.860, P value was .000 which shows that there is a significant correlation at 0.01 level among Body Mass Index and Anterior Reach distance of Right and Left side. The Pearson correlation for right side Postero-medial reach was -.735 and that of left side was -.730, P value was .000 which shows that there is a significant correlation at 0.01 level among Body Mass Index and Postero-medial reach distance of right and left side. The Pearson correlation for right side Postero-lateral reach was -.805 and that of left side was -.805, P value was .000 which shows that there is a significant correlation at 0.01 level among Body Mass Index and Postero-lateral reach distance of right and left side. The Pearson correlation for right side Composite reach was -.836 and that of left side was -.824, P value was .000 which shows that there is a significant correlation at 0.01 level among Body Mass Index and Composite reach distance of right and left side. Also the value shows that the correlation is negative, i.e., as the Body Mass Index increases the static and dynamic balance decreases and vice versa. The increased abdominal fat shifts the body’s Centre of Mass and the Line of Gravity anteriorly, resulting in an increase in the magnitude of ankle torque that is required to stabilize the body in the upright position. Abdominal obesity decreases the angular movement of the thoracic segment and the range of motion of the thoracolumbar spine especially forward flexion. Obesity leads to gait abnormalities which
include decreased speed, cadence, stride length and an increase in the double leg support duration and the base of support. Gait abnormalities lead to poor muscular coordination, force production, decreased resistance to fatigue and functional impairments. Anterior tilt of the pelvis occurs during gait in obese persons impair the normal gait pattern. Obese persons have decreased ability to resist muscle fatigue that result in impairment in the balance control and requires more level of cognitive function for the coordination of the balance. Also excessive body fat increase the rate of perceived exertion during stresses resulting from balance and posture control. The balance is compromised in obese individuals while multitasking during the activities of daily living and needs greater attention to maintain the balance. In obesity there is an increased pressure in the plantar contact areas and pressure levels in the heel, midfoot and metatarsal areas. This increased pressure interferes with the function of the mechanoreceptors that is responsible for the maintenance of the body balance. Ambulatory stumbling and history of fall is more in obese individuals because of the impairment of balance. Body fatness is inversely associated with walking and balance abilities.

**Conclusion**

The result of the study shows that there is a significant negative correlation among the Body Mass Index and the static and dynamic balance in school children aged between 11 years and 14 years. Hence as the Body Mass Index increases the static and dynamic balance decreases and vice versa in school children. Thus the study concludes that obese school going children are having less static and dynamic balance.

**Ethical Clearance:** Ethical clearance has been obtained from the Institutional Ethical Committee of Bethany Navajeevan College of Physiotherapy

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCES**


15. Plisky, P.J.; Rauh, M.J.; Kaminski, T.W.; Underwood, F.B. Star Excursion Balance Test as a


Self–esteem and Psycho Social Impact of Dental Aesthetics among Children-Clinical Survey

Jincy V.V.,1 Suja M. K.2, Joshi K. C.3, Santhosh Kumar Caliaperoumal4

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ABSTRACT

Background: Self-esteem which is considered as one of the most important need to be satisfied by every individual during different stages of development. It is one of the major psychological concepts among children, especially during their transitional period. The self-esteem is related to the appearance, so the importance of dental aesthetics and related problems is a major element of self-esteem among children.

Aim: The aim of the study was to assess the level of self-esteem among the participants and to assess the Psychosocial Impact of Dental Aesthetics on self-esteem among the participant children, based on Clinical Survey.

Materials and Method: A total of 100 subjects aged 11-18 years were selected for study based on lottery method of Simple random sampling. The study was a clinical survey by Questionnaires pertaining to socio-demographic profile of age, gender, educational status, type of family, order of birth and nativity. The data collection was done in an interview schedule by answering the Questionnaires. The two standardised tools were used in the study, the Self-esteem scale developed by Rosenberg and the psychological Impact of Dental Aesthetics Questionnaire (PIDAQ) developed by Klages et al.

Statistical Analysis Used: Statistical tools used for the study ANOVA and independent sample T-test (T-test). Self-esteem and overall PIDAQ scale was compared with different variables of socio demographic profile.

Results: The result shows that there is no significant difference between any of the variables of both self-esteem and overall PIDAQ score.

Conclusions: The result led to a conclusion that both psychosocial impact of dental aesthetics and self-esteem has a common feature as both has difference in level of measurement among children by analysing its level through different socio demographic variables.

Keywords: Self-Esteem, psychological Impact of Dental Aesthetics Questionnaire (PIDAQ)

Introduction

The Self-esteem is the overall worth of a person that has to be formed and developed throughout his developmental stages. It’s one of the important personality traits that have an enduring and stable character from childhood. It starts to form as basement during childhood and get enriched during the later developmental milestones. The most important developmental milestones such as childhood to early and late adolescents are called as transitional period. In the transitional period, the appearance is an important matter of concern as it is considered as closely related to self-esteem or one of the important elements of self-esteem.

Aesthetic concern and related issues are the more common problems in these stages irrespective of

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As face and smile is an essential factor of appearance it is one of the main concerns coming to aesthetics. Thus by considering the relevance of the topic present study was conducted about self-esteem and (PIDAQ) Psychosocial Impact of Dental Aesthetics by analysing various variables in relation with the same based on clinical survey. The aim of the study was to assess the level of self-esteem among the participants and to assess the Psycho-social Impact of Dental Aesthetics on self esteem among the participant children, based on Clinical Survey.

**Materials and Method**

**Design:** Clinic based survey design. This is a descriptive research Conducted among 100 patients who are under dental treatment in Dar Al Hayath Medical Centre in Kingdom of, Bahrain.

The samples selected for the study were under the age group of 11-18 years. The sampling technique adopted for the selection of the respondent subjects was by lottery method under Simple random sampling method.

The tool of data collection used for the study was an interview schedule that included questionnaires pertaining to socio-demographic profile. The data collection was done in an interview schedule by answering the Questionnaires. The two standardised tools were used in the study, the Self-esteem scale developed by Rosenberg and the psychological Impact of Dental Aesthetics Questionnaire (PIDAQ) developed by Klages et al.

**Statistical Analysis**

For comparing Self-esteeem and PIDAQ with the variables of age, educational qualification, type of family, order of birth and nativity ANOVA test was used. The independent sample T-test (T-test) was used to compare and find the statistical significance of self-esteeem and PIDAQ with gender of the children.

**Results**

The self-esteem score was compared by with age, educational qualification, type of family, order of birth and nativity by using ANOVA (Table-1). The independent sample T-test was used to compare self-esteem and gender (Table-2). There is no significant difference between any of the variables and self-esteem. But the self esteem score was high among 16-18 years, with no higher study, nuclear family, single child, rural background and male child.

Overall PIDAQ scale was compared with age, gender, educational qualification, type of family, order of birth and, nativity by using ANOVA (Table-3). The independent sample T-test (T-test) was used to compare overall PIDAQ and gender (Table-4). There is no significant difference between among any of the variables and overall PIDAQ score. But the PIDAQ score was high among 16-18 years, with no higher study, joint family, youngest child, sub-urban background and male child.

The table-5 shows that there is no correlation between self-esteem on social impact, psychological impact, dental self-confidence, aesthetic concern and Overall PIDAQ score.

### Table 1: ANOVA Test for Comparing Self Esteem Score Based On Age, Educational Qualification, Type of Family, Order of Birth and Residence

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>N</th>
<th>Self Esteem score</th>
<th>F-value</th>
<th>P-value</th>
<th>Stat. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>11-12 yrs</td>
<td>16</td>
<td>32.06</td>
<td>1.715</td>
<td>3.090</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>13-15 yrs</td>
<td>40</td>
<td>31.90</td>
<td>2.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16-18 yrs</td>
<td>44</td>
<td>32.77</td>
<td>2.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational qualification</td>
<td>Secondary</td>
<td>34</td>
<td>32.00</td>
<td>1.435</td>
<td>3.090</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>Higher secondary</td>
<td>60</td>
<td>32.35</td>
<td>2.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not doing higher studies</td>
<td>6</td>
<td>33.67</td>
<td>1.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>N</th>
<th>Overall PIDAQ score</th>
<th>F-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>11-12 yrs</td>
<td>16</td>
<td>33.56</td>
<td>8.94</td>
<td>.055</td>
</tr>
<tr>
<td></td>
<td>13-15 yrs</td>
<td>40</td>
<td>34.50</td>
<td>11.47</td>
<td>.059</td>
</tr>
<tr>
<td></td>
<td>16-18 yrs</td>
<td>44</td>
<td>34.75</td>
<td>13.83</td>
<td>Not significant</td>
</tr>
<tr>
<td>Educational qualification</td>
<td>Secondary</td>
<td>34</td>
<td>34.15</td>
<td>11.85</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>Higher secondary</td>
<td>60</td>
<td>34.48</td>
<td>11.77</td>
<td>.059</td>
</tr>
<tr>
<td></td>
<td>Not doing higher studies</td>
<td>6</td>
<td>36.00</td>
<td>18.67</td>
<td>Not significant</td>
</tr>
<tr>
<td>Type of family</td>
<td>Nuclear</td>
<td>32</td>
<td>31.28</td>
<td>11.46</td>
<td>1.914</td>
</tr>
<tr>
<td></td>
<td>Joint</td>
<td>54</td>
<td>36.50</td>
<td>13.64</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>Extended</td>
<td>14</td>
<td>33.86</td>
<td>2.38</td>
<td>Not significant</td>
</tr>
<tr>
<td>Order of birth</td>
<td>Eldest</td>
<td>20</td>
<td>29.05</td>
<td>8.60</td>
<td>6.077</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>40</td>
<td>32.38</td>
<td>6.03</td>
<td>3.992</td>
</tr>
<tr>
<td></td>
<td>Youngest</td>
<td>34</td>
<td>40.94</td>
<td>16.54</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>Single child</td>
<td>6</td>
<td>36.17</td>
<td>15.74</td>
<td>Not significant</td>
</tr>
<tr>
<td>Nativity</td>
<td>Rural</td>
<td>41</td>
<td>33.95</td>
<td>10.09</td>
<td>.842</td>
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<td></td>
<td>Urban</td>
<td>37</td>
<td>32.14</td>
<td>5.95</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>Suburban</td>
<td>22</td>
<td>36.17</td>
<td>15.74</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

Table 4: Significance Test (T-test) For Comparing Overall PIDAQ Score Based on Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>N</th>
<th>Overall PIDAQ score</th>
<th>t-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>36</td>
<td>35.08</td>
<td>.384</td>
<td>1.984</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>64</td>
<td>34.11</td>
<td>Not significant</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Significance Test (T-test) For Comparing Self Esteem Score Based on Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>N</th>
<th>Self Esteem score</th>
<th>t-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>36</td>
<td>32.72</td>
<td>1.380</td>
<td>1.984</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>64</td>
<td>32.08</td>
<td>Not significant</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: ANOVA Table for Comparing Overall PIDAQ Score Based On Age, Educational Qualification, Type of Family, Order of Birth and Residence
Table 5: Correlation between self-esteem on dental self-confidence, social impact, psychological impact, aesthetic concern and Overall PIDAQ score

<table>
<thead>
<tr>
<th></th>
<th>Dental Self-confidence</th>
<th>Social Impact</th>
<th>Psychological Impact</th>
<th>Aesthetic Concern</th>
<th>Overall PIDAQ score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Esteem score</td>
<td>.153</td>
<td>.194</td>
<td>.139</td>
<td>.032</td>
<td>.196</td>
</tr>
</tbody>
</table>

Discussion

In this study we observed that 41% of the respondents are from rural area also only 16% of them have low self-esteem, in the study of Morris Rosenberg also it was stated that there was no association for self-esteem among children and their social classes.

The present study shows that there is no significant difference among respondents due to their age and self-esteem but the study done by Huajian Cai says that self-esteem is showing decrease with increase of age which means it is sensitive during development or age-related changes.

Frank M Biro et al in their study says that there is no significant difference found in self-esteem and gender difference same as like the present study. Margaret Zoller Booth in their study says that among 11-12 years student self-esteem was related to multiple indicators of later year academic achievements but in the present study it says that self-esteem has no significant difference based on their educational qualification even though it’s slightly high among children who are not doing their higher studies after higher secondary.

The present study states that psycho social impact of dental aesthetics is comparatively slightly high among males than females (64%) which is not agreeing with the study of Song Yi, C Zhang among young adults which shows the result among females the desire for orthodontic treatment is comparatively higher than males. Randa Abidia et al’s study among females also says that (89%) of them felt their teeth affected their attractiveness of their face which also influenced their quality of life.

Motloba in their study strongly agree that the age group 13-29 who are both male and female by showing the result significant negative impact on the psychological wellbeing of the patients due to malocclusion also the study enhance the patients general psychological wellbeing orthodontic treatment is showing an improved oral health-related quality of life, the same result is in the present study also as it is shown the psycho social impact of dental aesthetics is slightly high among 13-15 and 1-18 years old age group.

A study about self-esteem by and dental aesthetics among adolescents 13-16 years old is revealing that socio economic variability is playing an important role in self-esteem as it is seen when the dental aesthetics is high it comes and lowest level of self-esteem is among low socioeconomic status group which is somewhat agreeing with the present study the psycho social impact of dental aesthetics is slightly seen high among respondents from rural area who are considered as comparatively from low socioeconomic status. The correlation test also agrees that there is no positive correlation between self-esteem and any of the factors of psychosocial impact of dental aesthetics.

Conclusion

The research states that many of the socio demographic variables have influence on both self-esteem and psycho social impact of dental aesthetics among children even though it’s very slightly. The study also says that there is no correlation between self-esteem and any of the factors of psychosocial impact of dental aesthetics. Thus it can be concluded as both psychosocial impact of dental aesthetics and self-esteem has a common feature as both has difference in level of measurement among children by analysing its level through different socio demographic variables.

Ethical Clearance: Ethical clearence was obtained before commencing the study.

Source of Funding: Self

Conflict of Interest: Nil

REFERENCE


Effect of Electrical Stimulation along with Mendelsohn Maneuver in Muscles of Swallowing Function and Cognitive Function on Post-Stroke Dysphagia

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ABSTRACT

Aim & Objectives: To find out the Effect of electrical stimulation along with Mendelsohn maneuver in muscles of swallowing function and cognitive function on post stroke dysphagia subjects. To analyze the characteristics of cognition through MMSE in patients with sub-acute post-stroke dysphagia subjects and to evaluate laryngeal elevation and closure during swallowing muscle activity by Surface EMG.

Methodology: In this study, 30 subjects with stroke were selected as per inclusion and exclusion criteria. All samples under pre measures were assessed by therapist using sEMG (surface electromyography) for masseter, infrahyoid, suprahyoid muscles and MMSE (mini mental state examination) for cognition. After the pre-test measures all samples were reviewed for electrical stimulation. These were performed in supine lying on treatment table. Mendelsohn maneuver is taught to the patient and they are requested to do for every 2hrs. This protocol consists of 1 session/day; 6days/week for 2 weeks. Similarly outcome measures were re assessed for post test measurements of movement for swallowing recovery after 12 sessions.

Results: Statistical analysis of pre-test and post test values of group showed the significant changes with the p values of FOIS, MMSE and Surface EMG were p≤0.001, p≤0.001 and p≤0.001 respectively.

Conclusion: This study shows the significant improvement by using electrical stimulation with mendelsohn maneuver can improve the function of swallowing muscles and cognitive function was improved by treating dysphagia in subjects with post stroke dysphagia. Patient with severe dysphagia and decreased cognition had been improved when compared to the pre test assessment.

Keywords: electrical stimulation; cognition; mendelsohn maneuver; post stroke dysphagia; surface EMG; deglutation.

Introduction

Dysphagia is the common symptom in patients with stroke, with up to 50-70% of all cases of swallowing problems in their acute phase¹. Impaired swallowing is a common complication with the prevalence to be approximately between 42 and 67% after stroke². Dysphagia can lead to a deterioration of activities of daily living (ADL) and quality of life, leading to malnutrition, dehydration, aspiration pneumonia and increased mortality. Therefore, it is important to assess the presence of dysphagia in the early stages of post-stroke rehabilitation³-⁴. Stroke is one of the leading causes of death and disability in India. The estimated adjusted prevalence rate of stroke range, 84-262/100,000 in rural and 334-424/100,000 in urban areas. The incidence rate is 119-145/100,000 based on the recent population based studies⁵. The swallowing muscles are asymmetrical in both motor cortex⁶-⁷. Swallowing is defined as the semi-automatic motor action of the muscles of the respiratory and gastrointestinal tract that propels food from the
oral cavity into the stomach. Swallowing is also a complex phenomenon involving breathing, phonation and swallowing occurring at the same anatomical location requiring coordination between them, for a safe swallow and appropriate gas exchange. Although many stroke patients recover swallowing spontaneously, 11–50% still have dysphagia at six months. Patients have significant facial weakness, a high arched palate, micrognathia, and weak masseter and pterygoid muscles. The pharyngeal and laryngeal muscles may be affected such as palatopharyngeus muscle, superior constrictor muscle, middle constrictor muscle and inferior constrictor muscle, levator veli palatini. However, it is still controversial as to which of the two hemispheres plays a more important role in swallowing, and which injured hemisphere is more likely to cause the specific patterns of dysphagia seen in stroke patients. Both hemispheres play a larger role in swallowing, and which wounded hemisphere is more likely to cause specific patterns of dysphagia in stroke patients, the left hemisphere is associated with the oral phase, and the right hemisphere is the pharyngeal phase. The entire voluntary oral phase is mainly controlled by the medial temporal lobes and the limbic system of the cerebral cortex with contributions from the motor cortex and other cortical areas where cognition is affected. Several studies have shown that dysphagia is associated with other neurological conditions related to stroke, such as cognitive dysfunction and neglect. However, most of these studies investigated the relationships between post-stroke dysphagia and cognitive deficits by using simple cognitive screening tests, such as the Mini-Mental State Examination (MMSE). Although MMSE is commonly used in clinical practices, it does not assess frontal lobe functions and mainly evaluates. The left hemisphere involves cognitive functions, including language, verbal memory, and calculation.

The FOIS is an ordinal scale reflects the functional oral intake of patients with dysphagia is levels (1 to 7). Although a standard clinical examination of dysphagia in stroke patients has recently been published, Electrical stimulation, when applied in this way, accelerates muscle building, accelerates cortical reorganization (especially after stroke), and increases the effectiveness of exercise therapy. The Mendelsohn maneuver, or the voluntary extension of the hyolaryngeal elevation to the swallow’s spike, has been used to treat patients with pharyngeal dysphagia for many years - sometimes as a compensatory strategy to help the bolus pass more efficiently in the pharynx. Some studies provide data on dysphagic patients who used the Mendelsohn maneuver as part of a series of exercises to rehabilitate them, but none used the maneuver alone and reported a change in the physiology of swallowing. Surface electromyography (sEMG) provides information on the temporal and amplitude characteristics of muscle contraction during swallowing. It is a non-invasive and inexpensive technique for studying muscle activity. It has been used to study the function of swallowing. Surface electromyography (sEMG) is useful for monitoring performance of the effortful swallow and can be used to collect and display information regarding performance of these maneuvers in treatment; such performance-contingent information can enhance motivation, compliance and task performance.

**Methodology**

**Participants:** The sample will be drawn from Physiotherapy department OPD and IP at Saveetha Medical hospital. The subjects will sign an informed consent form after elaborate education about the study purpose, duration and other aspects by the researcher. The subjects who fulfill the criteria’s of inclusion will be selected for the study. Inclusion criteria: Age group: 30-75 years, both genders, Patients must be conscious and comprehensive, Ischemic/haemorrhagic stroke patients leading to admission to the SMCH, Post stroke subjects with difficulty in swallowing. Subjects confirmed swallowing difficulty with Functional oral intake scale. Exclusion criteria: Individuals with current/history of tracheotomy or other structural alteration to the swallowing mechanism, Individuals with unconsciousness, Patients with histories of diseases related to swallowing, severe cognitive impairment (MMSE≤9), or severe aphasia preventing thorough evaluation of neurocognitive function, Recent trauma, unstable vital signs, recent surgeries around the neck.

**Procedure:** Subjects who are willing to participate in this study were screened for inclusion and exclusion criteria. They were explained about the safety and simplicity of the procedure and informed consent were obtained. Thirty post stroke dysphagia patients were selected from Saveetha Physiotherapy and rehabilitation centre (SPARC), Saveetha Institute of Medical and Technical Sciences (SIMATS) after concern referral for the study by using convenient sampling method. Informed consent was been obtained from each patient before the intervention. All the 30 samples were taken for confirmatory test FOIS (Functional oral intake scale) level of 1-4 to assess the level of swallowing inability and were selected for the study. The subjects under pre measures were done by using two scales as an outcome measure they are Semg by placing Patient position was sitting and three muscle groups were investigated and muscle activity recorded. Three muscle locations were examined in the study: (1) masseter (2) submental (3)
Infrahyoid its frequency, amplitude and duration are noted and MMSE scale (mini mental state examination) for cognition it is a diagnostic test to assess the cognition.

After the pre-test measures all 30 samples reviewed for electrical stimulation. Patient position is in supine lying and pillow is placed under the head, inactive electrode placed on the nape of neck and active pen electrode over the pharyngeal muscles and the current is surged faradic, intensity is minimum. Palpable, observable, contractions of minimum of 90/session and should be done as 1 session/day; 6days/week for 2 weeks. Mendelsohn maneuver is taught to the patient by asking the patient to take a small bit of food or sip of water then hold it in mouth, position index finger and thumb around Adams apple (thyroid notch) when they swallow and when the adams apple reaches the highest point of elevation then made to hold it with muscles for 5 seconds, then release. And make them to repeat it with each swallow. This was advised to do for every 2 hours in ward.

Result

Results of this study show that electrical stimulation with mendelsohn maneuver to swallowing muscles improves the muscle activity and simultaneously cognition also improves along with it in subjects with post stroke dysphagia.

### Table 1: Pre-Test and Post-Test Values FOIS, MMSE and SURFACE EMG right and left (masseter, submental and infrahyoid)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>T Value</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional Oral Intake Scale (FOIS)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>1.93</td>
<td>0.82</td>
<td>-32.904</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>5.96</td>
<td>1.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimental State Examination (MMSE)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>22.26</td>
<td>1.43</td>
<td>-38.633</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>28.43</td>
<td>1.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surface Electro Myography (S EMG)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masseter Right Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>15.98</td>
<td>0.93</td>
<td>-142.309</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>65.79</td>
<td>2.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masseter Left Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>15.87</td>
<td>1.01</td>
<td>-131.668</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>65.49</td>
<td>1.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submental Right Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>24.58</td>
<td>1.86</td>
<td>-331.590</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>115.63</td>
<td>2.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submental Left Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>24.16</td>
<td>2.23</td>
<td>-195.467</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>114.75</td>
<td>3.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrahyoid Right Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>18.87</td>
<td>0.97</td>
<td>-212.430</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>77.30</td>
<td>2.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrahyoid Left Side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>18.83</td>
<td>0.86</td>
<td>-137.203</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>75.71</td>
<td>2.94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The purpose of the study is to determine the effect of electrical stimulation with Mendelsohn maneuver in swallowing function muscles and Cognitive function on Post-stroke dysphagia. To investigate characteristics of the post-stroke dysphagia and to determine the relationships between swallowing dysfunction and cognitive functions in patients with stroke and to determine whether any lasting physiologic changes in swallowing function can occur from utilizing the Mendelsohn maneuver as an exercise.

One of the aims of the present study was to evaluate the long-term effect of electrical stimulation on swallowing performance, including involuntary and voluntary swallowing. Cognitive function tests revealed lower performance in all measured subtests for the dysphagia. Earlier work for example revealed that low MMSE scores and neglect were associated with dysphagia. For the current investigation, we hypothesized that duration of superior and anterior maximal hyoid movement would be prolonged, as well as duration of UES opening.

Over a period of 4 weeks of treatment session, the result of the present study found that there is an extremely significant improvement in swallowing muscles and cognition with mendelsohn maneuver and electrical stimulation.

Conclusion

The study result showed that electrical stimulation with mendelsohn maneuver is effective to effective in promoting the activity of palatopharyngeal muscles during swallowing and cognitive functions might contribute to the severity of dysphagia in stroke patients.

Limitations & Recommendations

Limitations are less number of RCT’s was enrolled in the study. The study did not use dysphagia severity scale to assess the severity of stage. In this study only qualitative outcomes were performed. Recommendations are Further studies including a larger patient cohort were needed to fully verify the results. Dysphagia severity can be used for the assessment. Quantitative outcome can be used to assess for the effectiveness of cortical reorganization.

Ethical Clearance: The study was approved by Institutional Ethics Committee (Number 020/15/2018/IEC/SU on 15/02/2018) and was done in accordance with Ethical Guidelines for the Human Participants. This study protocol was approved by institutional ethical committee.

Conflict of Interest: Nil

Sources of Funding: Self

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Collation of Different Sleep Pattern and Their Heart Rate Variability in Healthy Individuals

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ABSTRACT

Background: Heart Rate variability (HRV) is a powerful non-invasive tool which can be used to detect the status of cardio-autonomic function. Its analysis gives information about the cardiac health status. In this study we tried to find out what is impact of different sleep patterns of healthy individuals on their respective heart rate variability.

Objectives: To assess the relationship between sleep duration along with its quality and autonomic function in healthy adult individual. The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep duration & its quality. Heart Rate Variability (HRV) was used as non-invasive indicator of autonomic function to examine the influence of sleep.

Design: Cross-sectional and experimental study on the effect of sleep duration along with its quality on autonomic nervous activity.

Participants: Apparently healthy individuals without any systemic and sleep disorder were included. Individual divided on the basis of sleep duration and its quality into 3 groups: Normal sleepers with good quality (N=20), Short sleepers with poor quality(N=20), & Long sleepers with good quality(N=20).

Method: We examined the subjective sleep duration and quality (efficiency, latency, awakening, medication) by the Pittsburgh Sleep Quality Index (PSQI). Time, Geometric and Frequency domain measures were calculated on supine 5-minute measurements of ECG.

Results: Time domain measures like STDHR, SDNN, TINN and RRTri significantly reduced in the long and short sleepers as compared to the normal sleepers. Frequency domain measures VLF, HF, Total power were also reduced in short & long sleepers.

Conclusion: From this study we conclude that the sleep duration along with its quality is associated with the autonomic nervous function. HRV was significantly altered in individuals with long and short sleep duration. This shows alteration in autonomic nervous system activity found in long and short sleepers in healthy individuals.

Keyword: PSQI, Sleep duration and quality, STDHR, TINN, RRTri, VLF, HF, Total power, ECG, Autonomic Nervous System.

Introduction

Sleep plays a crucial role in our well-being. It is a vital healing process which helps in repairing and rejuvenating our body. States of brain activity during sleep and wakefulness is a result of different activating & inhibiting process that are generated within brain.

Sleep is important for our general wellbeing but it should be for an optimum duration and quality. As evident from the literature, sleep duration in human being can be categorized into: Short sleep duration (≤6 hours) (1-4), Normal sleep duration (7 or 8 hours.) (5-8), Long sleep duration (≥9 hours). (9-11) Sleep quality is also important predictor for autonomic development in childhood than the sleep duration. (12) Subjective sleep quality, (13,14) and duration is assessed by a reliable tool i.e. The Pittsburgh Sleep Quality Index (PSQI).
HRV examines the tonic baseline of autonomic activity. Low HRV values usually indicate a relative sympathetic dominance. On the other hand, high HRV values indicate a shift of the sympathetic/parasympathetic balance toward increased vagal activity. All the parameters of HRV decrease with the age increases, especially of parasympathetic cardiac activity due to aging\textsuperscript{15}. Conversely, there is developing confirmation that unfavourable psychosocial factors might also be connected with a fall in HRV and different measures of irregularity in sympathetic\textsuperscript{16}.

There are two approaches to measuring HRV: Time domain and frequency domain measures. In time domain, the standard deviation of NN intervals (SDNN) represents the general measurements of the nervous system\textsuperscript{17} and the root mean square of successive differences (RMSSD) reflects the parasympathetic activity of the nervous system. Geometric time-domain methods are obtained through the conversion of the NN intervals data into geometric forms like histograms or the HRV triangular index (RRTri) and Triangular interpolation of RR intervals (TINN) that is a valuable estimate of overall HRV\textsuperscript{18,19}.

In frequency domain, spectral analysis of R-R intervals can detect two major components: called high frequency component (HF) of physiologic HRV (spectral band from 0.15 to 0.4 Hz), and the low frequency (2). Component (spectral band from 0.04 to 0.15 Hz). The HF component represents predominantly parasympathetic activity of the nervous system and LF component represents both sympathetic and parasympathetic activity of the nervous system. The total power represents overall HRV. The ratio LF and HF is used to assess the fractional distribution between the two systems and is an important marker of sympatho-vagal balance\textsuperscript{20}.

In this study we focused on understanding the link between sleep and autonomic function. Our Intention is to explore phenotype-phenotype link between sleep and autonomic function as measured through HRV.

**Methodology**

A written consent was taken from all participants in the study. All the Parameters of the group were collected between 9:00 am to 5:00 pm at room temperature (20-22°C). Subjects were told to report 15 minutes before screening. They were asked to have light breakfast at least two hour before and allowed to have relaxed for half an hour before the HRV test.

The study was conducted at Amity University, Noida. Subjects were recruited from the faculties and students from the campus

**Sample Design:** On the basis of sleep duration, individuals categorized into 3 groups-

- Short Sleepers (≤ 6 hours)\textsuperscript{1-6}
- Normal sleepers (7 or 8 hours)\textsuperscript{7-8}
- Long sleepers (≥ 9 hours)\textsuperscript{9-11}

Each category consists of Poor and Good quality of sleep.

**Study Design:** Cross-sectional and experimental study.

**Inclusion Criteria:** Age group of 18-44 years, both males and females, regular night time of sleep, body mass index (range 18-24 kg/m²), Individuals without any eating disorders (on a regular diet).

**Exclusion Criteria:** Individual unwilling to participate, Presenting any feature of systemic and/or sleep disorders, Any sleep disturbances, Shift workers (rotating or night schedules), Pregnancy or any hormonal dis balance, Habit of regular day time sleep or prolonged deviated sleep schedule.

**Questionnaire/Instruments**

**Sleep Assessment:** Sleep duration along with its quality was assessed through “The Pittsburgh Sleep Quality Index (PSQI)”. **Heart Rate Variability Assessment:** HRV is phenomenon with the beat to beat variation in the time interval. It can be termed as RR variability or cycle length variability PHYSIOBAC (KUBIOS 2.1) MATLAB Software system for Heart Rate Variability Test. The first 5 min. resting (supine) phase ECG data was analyzed in this study.

**Experimental Design**

Out of 100 screened volunteers, 87 were found free from any systemic and sleep disorders.

On the basis of PSQI, the subjects with normal, short & long duration of sleep having poor and good quality were grouped in 3 categories i.e. Group I- Normal with good quality; Group II- Short with poor quality; Group III- Long with good quality. It was intended to
To assess HRV of 30 volunteers of each group but due to low prevalence and slow turn up rate of volunteers, the numbers of HRV done in each group are as follows:

**No. of Volunteer**
- Group I: 20
- Group II: 20
- Group III: 20

**HRV Procedure:** HRV was assessed as per the HRV protocol. After PSQI screening a set of instruction (i.e. to remain nil orally 2 hours prior to test) was conveyed to the selected subjects.

**Analysis of HRV Data:** The first 5 min. resting (supine) phase ECG data was analyzed. The analysis of the data is done by using a sophisticated tool, Kubios HRV software package. The variability of heart beat intervals can be easily measured by using Kubios HRV.

**Statistical Analysis**
Statistical analyses were performed using IBM SPSS statistics (v.21). All data are presented as mean ± SD values.. Shapiro Wilk test was used to check the normal distribution. For comparison among the groups, One Way ANOVA was used to compare the normally distributed parameter and Independent Kruskal Wallis test was used for non-normally distributed parameter. Further, Independent t-test and Mann Whitney test were used to check the differences in two groups. P<0.05 was considered statistically significant.

**Results**
A total of 100 individuals were screened, but 87 healthy subjects provided sufficient sleep information on sleep duration & quality (with PSQI). Participants were categorized according to their sleep duration & quality into three groups out of which autonomic activity of 60 subjects was assessed with HRV for further analysis.

**Table 1: Baseline Demographic and clinical characteristics of individuals characterized on the basis of sleep duration along with its quality**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I (N = 20)</th>
<th>Group II (N = 20)</th>
<th>Group III(N = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(Years)</td>
<td>25.65 ± 3.36</td>
<td>23.91 ± 4.87</td>
<td>24.44 ± 4.44</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male*</td>
<td>11</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Female*</td>
<td>9</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>BMI</td>
<td>24.30 ± 3.07</td>
<td>24.33 ± 3.58</td>
<td>25.01 ± 2.91</td>
</tr>
<tr>
<td>SBP</td>
<td>121.5 ± 8.75</td>
<td>119.33 ± 8.91</td>
<td>121.33 ± 5.56</td>
</tr>
<tr>
<td>DBP</td>
<td>78 ± 7.677</td>
<td>75.5 ± 7.34</td>
<td>80.66 ± 3.74</td>
</tr>
<tr>
<td>HR</td>
<td>74.3 ± 4.36</td>
<td>77.75 ± 3.65</td>
<td>80.22 ± 10.26</td>
</tr>
<tr>
<td>RR</td>
<td>16.6 ± 0.75</td>
<td>15.91 ± 1.31</td>
<td>17.33 ± 1.11</td>
</tr>
</tbody>
</table>

*, values expressed in numbers. Values expressed in Mean ± S.D. Group I, Normal sleepers with good quality of sleep; Group II, Short sleepers with poor quality of sleep; Group III, Long sleepers with good quality of sleep; BMI, Body Mass Index; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; HR, Heart Rate; RR, Respiratory Rate;

Sleep quality, defined as a PSQI score i.e. Group I and Group III contain good quality with scores 2.05 ± 1.19 & 2.22 ± 1.20 respectively and Group II had 5.83 ± 0.83 score which shows the poor quality of sleep (Table 2). The mean sleep duration (S.D) in Group I, Group II, Group III was 7.57 ± 0.40, 5 ± 1.02 & 9 ± 0.25 respectively.

**Table 2: Comparison of PSQI parameters among three groups**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I (N = 20)</th>
<th>Group II (N = 20)</th>
<th>Group III(N = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sleep Time(Hrs.)</td>
<td>7.57 ± 0.40</td>
<td>5 ± 1.02</td>
<td>9 ± 0.25</td>
</tr>
<tr>
<td>Sleep onset latency(Min.)</td>
<td>11 ± 7.88</td>
<td>11.6 ± 10.73</td>
<td>10 ± 8.66</td>
</tr>
<tr>
<td>Global PSQI score</td>
<td>2.05 ± 1.19</td>
<td>5.83 ± 0.83</td>
<td>2.22 ± 1.20</td>
</tr>
</tbody>
</table>

Values expressed in Mean ± S.D.
Table 3 and Figure 1 indicates that the STDHR, SDNN, RRtri, TINN in Group II and Group III was also showed decreased as compared to Group I and showed statistically significant difference in between groups. The Mean RR, RMSSD, NN50, pNN50 in Group II & Group III tended to be reduced as compared to the Group I, but showed no statistical significant changes in between groups. Overall HRV reflected by SDNN, RR Tri and TINN was found reduced in the long and short sleepers as compared to the normal sleepers.

Table 3: Comparison of time domain measure of heart rate variability among three groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I (N = 20)</th>
<th>Group II (N = 20)</th>
<th>Group II (N = 20)</th>
<th>Significant level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean RR(ms)</td>
<td>870.8 ± 149.6</td>
<td>841.30 ± 68.15</td>
<td>849.05 ± 186.78</td>
<td>.833</td>
</tr>
<tr>
<td>Mean HR (1/min)</td>
<td>71.10 ± 11.66</td>
<td>71.99 ± 5.80</td>
<td>73.95 ± 15.86</td>
<td>.825</td>
</tr>
<tr>
<td>STDHR (1/min)</td>
<td>4.86 ± 1.02</td>
<td>4.19 ± 1.26</td>
<td>3.58 ± 2.02</td>
<td>.025*</td>
</tr>
<tr>
<td>SDNN(ms)</td>
<td>59.45 ± 18.80</td>
<td>48.25 ± 11.14</td>
<td>41.12 ± 27.61</td>
<td>.047*</td>
</tr>
<tr>
<td>RMSSD(ms)</td>
<td>51.92 ± 27.79</td>
<td>37.25 ± 14.44</td>
<td>38.2 ± 31.24</td>
<td>.215</td>
</tr>
<tr>
<td>NN50</td>
<td>92.6 ± 61.44</td>
<td>61.41 ± 52.46</td>
<td>55.88 ± 72.26</td>
<td>.156</td>
</tr>
<tr>
<td>pNN50(%)</td>
<td>28.22 ± 21.28</td>
<td>17.50 ± 15.21</td>
<td>18.4 ± 25.00</td>
<td>.195</td>
</tr>
<tr>
<td>RRtri</td>
<td>13.75 ± 4.09</td>
<td>12.69 ± 2.61</td>
<td>9.59 ± 5.88</td>
<td>.037*</td>
</tr>
<tr>
<td>TINN(ms)</td>
<td>228.25 ± 78.40</td>
<td>215 ± 57.28</td>
<td>157.22 ± 104.79</td>
<td>.047*</td>
</tr>
</tbody>
</table>

Values expressed in Mean ± S.D. * shows statistical difference in Group I and Group III (p<0.05); Mean RR, The mean of the RR intervals; Mean HR, The mean of the heart rate; STDHR, Standard Deviation of Heart Rate; SDNN, The standard deviation of NN intervals; RMSSD, Root mean square of successive differences; NN50, the number of pairs of successive NN intervals that differ by more than 50 ms ; pNN50, the proportion of NN50 divided by total number of NN intervals. RRtri, Triangular Index of RR intervals; TINN, Triangular Interpolation of RR intervals; ms, milliseconds.

![Figure 1: Effect of sleep on time domain measures of HRV Time Domain Parameters](image)

Table 4: Comparison of frequency domain measures of Heart Rate Variability among three groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I (N = 20)</th>
<th>Group II (N = 20)</th>
<th>Group II (N = 20)</th>
<th>Significant level</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLF(ms²)</td>
<td>1219.1 ± 997.75</td>
<td>1073.33 ± 776.42</td>
<td>450 ± 365.33</td>
<td>.032*</td>
</tr>
<tr>
<td>LF(ms²)</td>
<td>990.15 ± 969.20</td>
<td>562.83 ± 288.27</td>
<td>711.33 ± 1104.40</td>
<td>.186</td>
</tr>
<tr>
<td>HF(ms²)</td>
<td>1210.75 ± 809.40</td>
<td>674 ± 528.21</td>
<td>830.33 ± 1108.76</td>
<td>.088*</td>
</tr>
<tr>
<td>LF/HF</td>
<td>1.06 ± 0.81</td>
<td>1.32 ± 1.33</td>
<td>1.55 ± 1.84</td>
<td>.79</td>
</tr>
<tr>
<td>Total power</td>
<td>3421.45 ± 2265.16</td>
<td>2311.33 ± 1118.4</td>
<td>1994.88 ± 2412.02</td>
<td>.044*</td>
</tr>
<tr>
<td>LFnu</td>
<td>45.09 ± 18.69</td>
<td>49.7 ± 15.41</td>
<td>49.95 ± 19.85</td>
<td>.7</td>
</tr>
<tr>
<td>HFnu</td>
<td>54.86 ± 18.66</td>
<td>50.22 ± 15.38</td>
<td>49.911 ± 19.88</td>
<td>.7</td>
</tr>
</tbody>
</table>
Values expressed in Mean ± S.D. * shows statistical difference in Group I and Group III (p<0.05). # shows statistical difference in Group I and Group II (p=0.05).

VLF, Very Low Frequency; LF, Low Frequency power; HF, High Frequency power; LF/HF, Sympatho-Vagal balance; nu, normalized value; ms, millisecond.

While comparing the parameters of frequency domain in Group I, Group II and Group III, VLF and total power was reduced in Group II and Group III and was found significant differences in the Group I and Group III (Table 4). The HF was found significantly reduced in Group II as compared to Group I. LF was found lowered in Group II and Group III as compared to Group I but not significantly different. LF/HF ratio was not significantly different in between the Groups. LFnu was found increased whereas HFnu was decreased in Group II & Group III as compared to Group I but differences were not statistical significant. This shows the sympathetic activity is more and parasympathetic activity is less in the individuals with long and short sleeping hours in comparison of normal sleepers. Overall HRV that denoted by the total power was also reduced in the long and short sleepers.

**Conclusion and Discussion**

It was concluded from this study that sleep duration along with its quality is associated with the autonomic nervous function. HRV was significantly altered in individuals with long and short sleep duration. Alteration in autonomic activity denotes reduced physiological flexibility & mal-adaptation to internal and external stressors. Phenotype to phenotype correlation such as association between sleep & autonomic function accentuate essentiality of optimum sleep duration & quality health. Moreover, bidirectional association of sleep and autonomic activity would not only be helpful to assess risk and severity of disease but also modulate life style changes as therapeutic intervention.

**Strengths & Limitations of the Study**

**Strengths:** It was a novel approach to explore association between both sleep duration and quality with the autonomic nervous system activity through heart rate variability (HRV) in healthy population. Though the subjective assessment of sleep was performed with PSQI but thorough history & pattern of sleep phenotype was studied in detail.

**Limitations:** Our study had a small sample size due to low prevalence and slow turn up rate of volunteers. Also gender regression was not attempted due to small sample size.

**Conflict of Interest:** Nil.

**Source of Funding:** Self.

**Ethical Clearance:** Taken from IEC of Amity University, Noida.

**REFERENCES**


Serum Lipid Profile among the Patients of Various Cardiac Diseases Admitted in Intensive Cardiac Care Unit (ICCU)

ABSTRACT

Introduction: Cardiovascular disease (CVD) is one of the leading cause of morbidity and mortality globally. Hypertension is a major risk factor for CVD and account for more than 80% of deaths. Increased total cholesterol, triglycerides, LDL and decreased HDL are risk factors in CVD patients. As various types of cardiac diseases are differentially changes the metabolic patterns, hence the current study was undertaken to evaluate serum lipid profile of the patients suffering from various cardiac diseases.

Methodology: Cross-sectional study conducted on 278 CVD patients. Anthropometric, physiological and lipid profile parameters were recorded by using standard techniques. Statistical analyses were done by using SPSS software version 23.0.

Results: SBP, DBP, MAP and PP show a significant increase in hypertensive heart disease, myocardial infarction and ischemic heart disease as compared to other groups. Serum triglycerides, cholesterol and LDL were found to be statistically significant among hypertensive heart disease, myocardial infarction and ischemic heart disease groups.

Discussion: Results from present study revealed that there were serious changes in cardiovascular physiological parameters and lipid profile parameters among various types of CVD.

Conclusion: Results concluded that cardiovascular risk factors like blood pressure and lipid profiles are closely associated with each other and these risk factors are very specific in manifestation of different types of CVD especially linked with cardiovascular stress.

Keywords: lipid profile, dyslipidaemia, hypertension, cardiovascular diseases

Introduction

Cardiovascular disease (CVD) is one of the leading causes of death globally. Among the various types of CVD, coronary heart disease (CHD) is the most important cause of morbidity and mortality in both developed countries as well as in developing countries. Cardiovascular disease is regarded as a multifactorial disease, which is affected by the environment and genetic factors. Traditional cardiovascular risk factors, such as smoking, drinking, diabetes, dyslipidemia and advanced age, can increase the risk of cardiovascular disease. Hypertension is also a major risk factor for CVD and account for more than 80% of deaths. It is widely accepted that CVD is associated with hypertension and dyslipidaemia. Various epidemiological studies have established a strong association of hypertension and coronary artery diseases. In general, hypertension doubles the risk of cardiovascular disease and accelerates significantly the development of atherosclerosis.
Apart from many traditional cardiovascular disease risk factors, dyslipidaemia is considered as the most important factor which is a strong predictor for cardiovascular malfunction. Increased total cholesterol (TC), triglycerides (TG), low-density lipoprotein-cholesterol (LDL-C) and decreased high-density lipoprotein-cholesterol (HDL-C) are risk factors in myocardial infarction (MI) patients. Interestingly some other observations revealed that, baseline LDL-C was not associated with CVD events.

There are several contradictory findings on lipid profile in association with CVD. The contradiction on lipid profile in some cases on LDL-C or TG and some cases in HDL-C or TC/HDL-C ratio in relation to different types of CVD.

As there are several contradictory reports on dyslipidemia among the cardiac patients, hence current study has been undertaken to evaluate serum lipid profile of the patients suffering from various types of cardiac diseases admitted in ICCU of a tertiary hospitals in north Karnataka.

### Methodology

This cross-sectional study was conducted on 278 [With 95% confidence level, anticipated prevalence of cardiovascular diseases is 3% and desired precision as ± 5. the minimum sample size is 45 per group] cardiovascular disease patients with age range from 40-70 years who were admitted in ICCU of Shri B.M. Patil Medical College, Hospital and Research Centre, Vijayapur (Karnataka). The patients with all cardiovascular diseases diagnosed for myocardial infarction, MI (group1), ischemic heart disease, IHD (group2), angina (group3), hypertensive heart disease (group4), rheumatic heart disease, RHD (group5), congestive cardiac failure, CCF (group 6), cardiomyopathy (group7), admitted in ICCU were included in the study. Patients suffering from hyperthyroidism, antihypertensive drugs, chronic kidney disease, supplementation with drugs that are known to alter biochemical parameters, metabolic and malignant bone diseases were excluded from the study.

Institutional ethical clearance was obtained (IEC No-111/2015-16, dated 10/04/2015), purpose of study was explained and informed consent in local language (Kannada) was taken from all the patients. A data collection sheet was designed to gather all the necessary information of the patients. The written official permission was also taken from the hospital administrator. Detail clinical history from all the patients was noted.

Physical anthropometry: Body mass index (BMI): All the study participants were weighed barefoot with minimum clothing using an electronic weighing machine. Body weight was recorded to the nearest of 0.1 kg. Height was measured to the nearest of 0.1 cm using standard measuring tape. BMI was calculated using the formula BMI=Weight (kg)/Height² (m).

Physiological parameters : respiratory rate (RR), pulse rate (PR) systolic blood pressure (SBP), diastolic blood pressure (DBP), pulse pressure and mean arterial pressure (MAP) were recorded immediately after their hospitalization by using standard techniques.

Lipid profile: serum triglyceride, serum cholesterol, low-density lipoprotein (LDL), high-density lipoprotein (HDL), very low-density lipoprotein (VLDL) were also measured in all study subjects by using standard laboratory kits method (random blood samples were collected immediately after their hospitalization on day 1).

Statistical analyses were done by using SPSS software version 23.0. All characteristics were summarized descriptively. For continuous variables, the summary statistics of mean ± standard deviation (SD) were used. Chi-square ($\chi^2$) test was used for association between two categorical variables. The difference of the means of analysis variables between two independent groups was tested by unpaired t test. The difference of the means of analysis variables between more than two independent groups was tested by ANOVA and F test of testing of equality of Variance. Tukey’s post-hoc test was used for multiple comparison.

### Results

Table 1 shows mean age and anthropometric parameters of various cardiovascular disease patients. BSA shown significant difference in different cardiac disease groups although the values remain within the normal range.

Results from physiological parameters like blood pressures depict a significant changes between the groups (p<0.05). (table 2). Results clearly shows a higher blood pressure values in all the components of blood pressure in case of group 1, 2 and 3 as compared to normal blood pressure values. Similarly results from lipid profiles from CVD patients also showed a significant changes between the groups (p<0.05). A higher cholesterol level from normal range has been observed in case of group 1 and 2. Similarly in case of triglycerides, groups 1,2 and 3 also shows higher triglyceride limit from normal range. LDL levels in groups 1,2,3 and 6 showed statistically significant higher levels. Though HDL and VLDL levels showed statistically significant difference among cardiac patient groups but values are within normal range.
Table 1: Comparison of mean anthropometric parameters among cardiac patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal Values</th>
<th>HHD (n = 39)</th>
<th>MI (n = 49)</th>
<th>IHD (n = 44)</th>
<th>ANGINA (n = 40)</th>
<th>CCF (n = 35)</th>
<th>RHD (n = 33)</th>
<th>Cardiomyopathy (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>-</td>
<td>50.77 ± 7.44</td>
<td>55.16 ± 7.18</td>
<td>50.64 ± 7.43</td>
<td>51.38 ± 6.89</td>
<td>52.18 ± 7.81</td>
<td>48.27 ± 8.50</td>
<td>58.03 ± 8.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a</td>
<td>f</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>ef</td>
</tr>
<tr>
<td>Height (cms)</td>
<td>-</td>
<td>159.67 ± 5.3</td>
<td>160.98 ± 5.93</td>
<td>161.09 ± 5.83</td>
<td>161.13 ± 5.49</td>
<td>160.73 ± 4.86</td>
<td>160 ± 5.95</td>
<td>161.3 ± 5.39</td>
</tr>
<tr>
<td>Weight (kgs)</td>
<td>-</td>
<td>63.59 ± 10.53</td>
<td>66.39 ± 10.82</td>
<td>66.75 ± 10.69</td>
<td>67.58 ± 10.58</td>
<td>65.12 ± 10.1</td>
<td>63.58 ± 9.58</td>
<td>65.46 ± 11.32</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>18.5-24.9</td>
<td>24.87 ± 3.36</td>
<td>25.53 ± 3.22</td>
<td>25.62 ± 3.04</td>
<td>25.94 ± 3.1</td>
<td>25.16 ± 3.28</td>
<td>24.79 ± 3</td>
<td>25.05 ± 3.33</td>
</tr>
<tr>
<td>BSA (m²)</td>
<td>1.7-1.9</td>
<td>1.92 ± 0.14a</td>
<td>1.81 ± 0.15b</td>
<td>1.71 ± 0.15c</td>
<td>1.72 ± 0.14d</td>
<td>1.63 ± 0.15</td>
<td>1.57 ± 0.15a</td>
<td>1.67 ± 0.16</td>
</tr>
</tbody>
</table>

hypertensive heart disease (HHD); myocardial infarction (MI); ischemic heart disease (IHD); Angina pectoris (Angina); congestive cardiac failure (CCF); rheumatic heart disease (RHD).

* significant at 5% level of significance (p < 0.05), a, b, c, d, e, f, g represent significant difference in multiple comparison by tukey’s test (p < 0.05)

Table 2: Comparison of mean physiological parameters among cardiac patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal Values</th>
<th>HHD (n = 39)</th>
<th>MI (n = 49)</th>
<th>IHD (n = 44)</th>
<th>ANGINA (n = 40)</th>
<th>CCF (n = 35)</th>
<th>RHD (n = 33)</th>
<th>Cardiomyopathy (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR (cpm)</td>
<td>12-20</td>
<td>20.87 ± 9.28</td>
<td>20.16 ± 8.43</td>
<td>20.82 ± 7.66</td>
<td>21.55 ± 8.67</td>
<td>17.39 ± 2.03</td>
<td>20.3 ± 3.68</td>
<td>19.84 ± 7.95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a,e</td>
<td>f</td>
<td>a,b</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>PR (bpm)</td>
<td>60-100</td>
<td>89.08 ± 23.23</td>
<td>86.41 ± 21.39</td>
<td>85.09 ± 19.11</td>
<td>86.15 ± 25.15</td>
<td>85.94 ± 22.09</td>
<td>83.33 ± 29.12</td>
<td>91.73 ± 27.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a,b,c,d,e</td>
<td>e</td>
<td>f</td>
<td>g</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>≤ 120</td>
<td>142.87 ± 25.21a,c</td>
<td>136.73 ± 21.31</td>
<td>139.91 ± 22.89</td>
<td>124.35 ± 31.55b,c</td>
<td>130.42 ± 26.64</td>
<td>133.03 ± 29.51d,c,e</td>
<td>141.35 ± 23.96b,d,e</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a,e</td>
<td>f</td>
<td>a,b,d,e</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>≤ 80</td>
<td>108.51 ± 33.78b,c,d,e,f</td>
<td>87.18 ± 22.03a</td>
<td>84.27 ± 23.71b</td>
<td>79.9 ± 27.85c</td>
<td>82.67 ± 20.79d</td>
<td>81.03 ± 29.3e</td>
<td>88.38 ± 24.86f</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a,e</td>
<td>f</td>
<td>a,b,c,d,e</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>MAP (mmHg)</td>
<td>≤ 90</td>
<td>115.82 ± 16.68b,c,d,e,f</td>
<td>98.59 ± 12.67a</td>
<td>100.22 ± 17.97b</td>
<td>100.4 ± 16.89c</td>
<td>98.48 ± 17.81e</td>
<td>98.94 ± 16.98c</td>
<td>100.04 ± 18.64f</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a,e</td>
<td>f</td>
<td>a,b,c,d,e</td>
<td>c</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>PP (mmHg)</td>
<td>≤ 40</td>
<td>58.87 ± 13.48b,c,d,e</td>
<td>51.1 ± 12.5d</td>
<td>47.41 ± 15.78a</td>
<td>37.2 ± 15.41b,c,d,e</td>
<td>46.3 ± 14c</td>
<td>49.82 ± 15.36</td>
<td>51.73 ± 17.44a</td>
</tr>
</tbody>
</table>

hypertensive heart disease (HHD); myocardial infarction (MI); ischemic heart disease (IHD); Angina pectoris (Angina); congestive cardiac failure (CCF); rheumatic heart disease (RHD); RR, respiratory rate; PR, pulse rate; SBP, systolic blood pressure; DBP, diastolic blood pressure; MAP, mean arterial pressure; PP, pulse pressure.

* significant at 5% level of significance (p < 0.05), a, b, c, d, e, f, g represent significant difference in multiple comparison by tukey’s test (p < 0.05)
Table 3: Comparison of mean lipid profile parameters among cardiac patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal Values</th>
<th>HHD (n = 39)</th>
<th>MI (n = 49)</th>
<th>IHD (n = 44)</th>
<th>ANGINA (n = 40)</th>
<th>CCF (n = 35)</th>
<th>RHD (n = 33)</th>
<th>Cardiomyopathy (n = 37)</th>
<th>F value</th>
<th>ANOVA p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol</td>
<td>150-220</td>
<td>228.49 ± 40.21&lt;sup&gt;a,b,c,d,e&lt;/sup&gt;</td>
<td>223.63 ± 36.36</td>
<td>221.82 ± 38.34&lt;sup&gt;a&lt;/sup&gt;</td>
<td>192.03 ± 36&lt;sup&gt;b&lt;/sup&gt;</td>
<td>187.27 ± 26&lt;sup&gt;e&lt;/sup&gt;</td>
<td>195.42 ± 36.03&lt;sup&gt;d&lt;/sup&gt;</td>
<td>202.7 ± 42.44&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.354</td>
<td>0.003*</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>50-150</td>
<td>170.77 ± 44.73&lt;sup&gt;a,b,c,d,e&lt;/sup&gt;</td>
<td>157.71 ± 40.09&lt;sup&gt;c&lt;/sup&gt;</td>
<td>168.61 ± 41.41&lt;sup&gt;b&lt;/sup&gt;</td>
<td>137.35 ± 51.17&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>146.09 ± 47.69&lt;sup&gt;e&lt;/sup&gt;</td>
<td>140.61 ± 48.75&lt;sup&gt;d&lt;/sup&gt;</td>
<td>131.65 ± 40.04&lt;sup&gt;c,g&lt;/sup&gt;</td>
<td>1.313</td>
<td>0.025*</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>90-129</td>
<td>139.02 ± 18.9&lt;sup&gt;b,c&lt;/sup&gt;</td>
<td>136.68 ± 18.19</td>
<td>134.49 ± 18.87</td>
<td>124.95 ± 19.06&lt;sup&gt;a&lt;/sup&gt;</td>
<td>129.05 ± 13.41</td>
<td>134.84 ± 19.01</td>
<td>129.88 ± 15.58&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.023</td>
<td>0.007*</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>37-71</td>
<td>81.62 ± 14.03&lt;sup&gt;b,c,d,e&lt;/sup&gt;</td>
<td>72.96 ± 11.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>73.95 ± 14.48</td>
<td>66.8 ± 14.77&lt;sup&gt;c&lt;/sup&gt;</td>
<td>65.91 ± 11.62&lt;sup&gt;d&lt;/sup&gt;</td>
<td>67.48 ± 8.97&lt;sup&gt;a&lt;/sup&gt;</td>
<td>68.57 ± 11.56&lt;sup&gt;f&lt;/sup&gt;</td>
<td>1.525</td>
<td>0.017*</td>
</tr>
<tr>
<td>VLDL (mg/dl)</td>
<td>15-40</td>
<td>37.89 ± 18.45&lt;sup&gt;a,b,c&lt;/sup&gt;</td>
<td>34.27 ± 15.82</td>
<td>39.14 ± 14.49</td>
<td>28.14 ± 15.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td>35.7 ± 18.62</td>
<td>32.88 ± 13.14&lt;sup&gt;b&lt;/sup&gt;</td>
<td>32.48 ± 15.05&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.161</td>
<td>0.047*</td>
</tr>
</tbody>
</table>

hypertensive heart disease (HHD); myocardial infarction (MI); ischemic heart disease (IHD); Angina pectoris (Angina); congestive cardiac failure (CCF); rheumatic heart disease (RHD). LDL, low-density lipoprotein; HDL, high-density lipoprotein; VLDL, very low-density lipoprotein.

* significant at 5% level of significance (p<0.05), a,b,c,d,e,f,g represent significant difference in multiple comparison by tukey’s test (p<0.05)

Discussion

Results from present study revealed that there were serious changes in cardiovascular physiological parameters among all the types of CVD where all components of BP were found to be higher than normal. Haque et al (2016) in their study found that 54% of the patients had hypertension (SBP>140 mmHg) which contributes to more than one third of premature mortality due to CHD and a greater proportion due to stroke. Our results also indicate a higher BP as compared to normal range in most of the types of CVD patients admitted in ICU which may be a possible reason behind dyslipidemia in group 1, 2, 3 of CVD patients admitted in ICU.

Conclusion

Results concluded that cardiovascular risk factors like blood pressure and lipid profiles are closely associated with each other and these risk factors are very specific in manifestation of different types of CVD especially linked with cardiovascular stress.

Source of Funding: By BLDE (Deemed to be University), Vijayapur.[ref.BLDEU/REG/RGC/2015-16, dated 18/2/16]

Conflict of Interest: Nil

Ethical Clearance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.
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Research on Strategic Transformation of Marketing Organic and Herbal Products with Respect to Chennai City

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ABSTRACT

Organic and herbal products marketing and their production of all-natural health food is not new phenomenal process. But during recent year’s interest in the buying and selling organic and herbal products, industry has increased incredible growth and transformations. Organically grown health food has created a solid niche for itself it’s a knowledge of people knowing anonymously. Indeed with the growth of organic products, among the utility of stakeholders an increased concern over the effects of organic and herbal crucially began to make a serious bid for control of the various industry particularly in field of marketing. Indian brands like Dabur India, Himalaya, Herbalife, Patanjali, Eco Farms, Khadi and 24 Mantra organic etc., are using MLM (Multi Level Marketing) techniques and strategies for marketing and distributing the products. Organic and herbal marketing is growing rapidly and consumers are willing to pay for organic products. Companies that integrate organic strategies into product development, operational process and marketing activities find new opportunities for competitive advantages. Organic products are more preferred by our people in the market today because of natural ingredients. In contrast it has drawn attention of more and more consumers and retailers even to sell the products from street to stations and from supermarkets to online stores with different enclaves. As a result, the work is focused on the analysis of competitive dynamics (inter-firm rivalry, pricing and non-price policies, barriers to entry, regulatory conditions, etc.) within the sector, and draws lessons for competition policy and to overcome the new strategic transformation model of the small scale organic and herbal products in Chennai City.

Keywords: Marketing, Organic, Herbal, Strategic, Transformations.

Introduction

Although Asia has a very active organic movement, the area under organic cultivation remains relatively small. Herbal and organic markets highly depend on consumers buying behavior. Change in the buying behavior leads to change in the market demand. Today the organic products are becoming popular, which lead towards a transformation in the market demand and consumer behavior [1] [2]. As India is considered to be rich in heritage for organic agricultural and farming, it helps towards the growth and design of strong market development. Rapid increase in organic products and herbal (ayurvedic) products has created more market opportunities and challenges. Market development requires different marketing techniques and efforts to increase consumer awareness.

Many researchers have attempted to explain the motivations and marketing issues relevant in various studies and articles, to the topic as we discussed earlier focuses on the analysis of competitive dynamics (inter-firm rivalry, pricing and non-price policies, barriers to entry, regulatory conditions, etc.) within the sector, and draws lessons for competition policy and to overcome the new strategic transformation model of the small scale organic and herbal products in Chennai City [3] [4]. In contrast, this study is organized as follows: (i) Investigation of the data on the structure of the organic and herbal products retail market in Chennai city, (ii) Summarizes recent changes in the Chennai markets

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(market dynamics), (iii) Drawing on the survey and the analyzed data (describes the conduct of retailers and suppliers, and analyzes the implications for competitive conditions), (iv) Discussion about the changes that can be observed in the future and (v) Finally, Competition policy issues.

Investigation of the data on the structure of the organic and herbal products retail market in Chennai city:
The retail sector in Chennai sold $1.3 billion worth of goods in 2016-2017. Its contribution to GDP amounted to $5.1 billion. The value of goods sold declined sharply in 2018 (10.2 billion). The retail sector employed 130 thousand people, and the number of people engaged in the sector (paid workers plus owners, self-employed and unpaid family workers) was 320 thousand in 2018. The retail sector, together with the wholesale sector, provides employment for 560 thousand people. In other words, it is one of the leading employment generation sectors in Chennai.

Even, the retail sector provides households essential consumption goods under the organic and herbal products in name of lemon grass, aloevera, botanical herbs etc. However, these same products are consumed by households as services provided by hotels and camping sites and restaurants, bars and canteens (that also includes activities and take-out activities). These services purchase as FMCGs from wholesale and/or retail trade outlets and substitute for consumption at home. These two sectors’ sales for private domestic consumption were about $15 billion in 2018.

An analysis of the market structure in supplier industries is necessary to understand the performance of the retail sector. In order to determine the degree of concentration in domestic supply, we need to check the level of concentration in imports, and the share of imports in domestic supply as well.

Recent changes in the Chennai markets (market dynamics) among various organic and herbal products: The market dynamics is to a large extent determined by the regulatory framework. In this part, we use the database of certain products to compare Chennai with various categories of economies because it covers a large number of countries and summarizes regulations in index form.

i. Patanjali Product:

Patanjali’s sales volumes grew 7% during October-March 2018 and 22% in April-September 2017, according to data from Kantar World panel, a global consumer research firm. That’s a sharp fall from 52% growth in October-March 2017 and 49% during April-September 2016.

Pedagogical Objectives in Chennai

- Product portfolio management, brand extension and market segmentation of patanjali reached 82% in Chennai market.
- Analysing product innovation strategies of Britannia as its competitive advantage
- Built its consumer-facing ayurveda business almost from scratch in a few years and gained market share and shelf space rapidly, challenging established multinational brands in all categories it has forayed in.

ii. 24 mantra product: Organic produce is an emerging market in India, clocking a turnover of Rs3,350 crore in 2016, and is expected to treble it by 2020. According to N. Balasubramanian, CEO of 24 Mantra Organic, among the largest organic food companies in India, rising consumer preference for safe food and emergence of companies who are working directly with farmers is driving this growth.

Pedagogical Objectives in Chennai

- To understand use of low-budget marketing techniques to market new-product offering
- To understand the concepts of viral marketing and below-the-line promotions
- To analyze the international expansion plans of a small family firm.

iii. Farm2Kitchen: Farm2kitchen is building the first technology platform of its kind for the Food Supply Chain- which will be a Global Food Marketplace, A Farmers Network while providing food traceability along the whole supply chain.

Pedagogical Objectives in Chennai

- To understand the global food market industry
- To discuss the core competence of farm to kitchen brands
- To analyze the probable synergies of the acquisition.
iv. Lever Ayush: Riding on a growing wave of interest in natural products and ingredients, Vaidya has, over the past couple of years, evolved the brand Dr Vaidya’s into much more. With 35 products, including those for hangovers and Chyawanprash-in-a-capsule, Dr Vaidya’s wants to latch onto the trend of first building a national and then an international business around natural products and ayurveda.

**Pedagogical Objectives in Chennai**

- To analyze the global and Indian ayurvedic medicine
- To illustrate effect market segmentation
- To understand growth strategies of natural products.

v. Dabur India: Dabur India Ltd. is one of India’s leading FMCG Companies with Revenues of over Rs 7,680 Crore & Market Capitalisation of over Rs 48,800 Crore. Building on a legacy of quality and experience of over 133 years, Dabur is today India’s most trusted name and the world’s largest Ayurvedic and Natural Health Care Company.

**Pedagogical Objectives in Chennai**

- To understand the diversification strategies followed by Dabur India
- To understand the efforts of other organic societies to emulate Dabur India.

**Drawing on the Survey and the Analyzed Data:** We have conducted interviews with about 20 large retailers, and on the basis of our findings, designed two surveys, one for retailers and the other one for FMCG-suppliers to get information about retailers’ conduct and retailer-supplier relations. We received responses from 51 retailer and 79 from suppliers. The responses rates were 50 percent and 40 percent, respectively. These comparisons suggest that our sample (the above mentioned products) firms provide a good coverage of large retailers. The coverage ratio for organic FMCG-supplier industries is also quite satisfactory (17.4 percent of sales in 2018).

The survey questionnaire included questions that define the “relevant market” for retailers. Three aspects of the market, consumers’ socio-economic status, retail format, and geo- graphical market, are used to define the “relevant market”. There are 10 retailers in our sample that are a member of a business group that also owns supplier firms. When asked about the relations with suppliers in the same group, 6 retailers said that they provide preferential access to shelf space for their sister suppliers, and 4 of them get lower prices and/or better payment conditions.

Although the number of vertically related retailers/ suppliers is small, these findings suggest that retailers (and suppliers) tend to favor their sister companies. This practice could be a concern for competition policy if any one of the vertically-related companies has a dominant position in the market. However, in our sample, it seems that medium-sized companies, not the large ones, have a stronger tendency to establish preferential relations with their other companies. In other words, the relations between vertically-related suppliers and retailers is not, at least for time being, likely to distort competitive conditions in the retail sector.

**Discussion about the Changes that Can be Observed in the Future:** There is no specific law regulating the retail market in Chennai for selling the organic and herbal products. A draft law prepared last year initiated an intense debate on a number of issues. It is obvious that almost all retailers and suppliers are in favor of having a law regulating the retail market. Suppliers are also strongly in favor of restrictions on payment conditions and exclusivity agreements whereas small and medium-sized retailers are indifferent and large retailers are weakly against these restrictions. While retailers, especially large ones, are against restrictions on promotions, suppliers are somewhat in favor of these restrictions, too. Overall, suppliers seem to be worried that retailers could pass on the costs of fierce competition in the market on their shoulders.

The issue of imposing restrictions on private label sales by retailers is a contested area where suppliers and retailers, and small and large firms disagree each other. Large retailers who can capitalize on the reputation they establish in the market by selling more private label products are against restrictions on private label sales, whereas medium-sized and large suppliers, who consider private label as a threat to their national brands, are in favor of these restrictions. Small and medium-sized retailers, who may not benefit much from private label products, are somewhat in favor of restrictions, and small suppliers, whose position may not differ under private label production, are indifferent. Private label products seem to be a tool that may shift the benefits of brand name advantages in favor of large retailers.
Competition Policy Issues: FSSAI issues draft regulations for organic food products as on Jan 12, 2018, New Delhi, stated, Food regulator FSSAI has come out with a draft regulation for organic food products, seeking to ensure that these food items are actually organic. Organic foods will have to comply with the provisions under the National Programme for Organic Production (NPOP) administered by the government or the Participatory Guarantee System for India (PGS-India) run by the Agriculture Ministry or any other standards notified by the food authority.

The Food Safety and Standards Authority of India (FSSAI) has sought public comments of the draft regulations, which has been prepared in view of rising demand for organic food products, being considered as healthy, in the country. “Organic food products are either those grown under a system of agriculture without the use of chemical fertilizers and pesticides or made from organically produced raw materials ... Currently, a number of food products are being marketed as organic,” the FSSAI said. However, the regulator said that consumers do not have any way to check the authenticity of organic food products due to lack of a regulatory framework. “The draft regulation on organic food is aimed at overcoming this problem and ensuring that what is sold as organic food is really organic,” FSSAI said. The draft regulation mandates that labeling of organic foods should convey full and accurate information on the organic status of the product.

Organic food products should also carry a certification mark or a quality assurance mark given by any of the notified certification bodies. The FSSAI’s draft has exempted organic food marketed through direct sale by the original producer or producer organization to the end consumer from verification compliance. However, this exemption does not apply to processed organic products. The FSSAI has defined ‘organic agriculture’ as a system of farm design and management to create an eco system of agriculture production without the use of synthetic external inputs such as chemicals, fertilizers, pesticides and synthetic hormones or genetically modified organisms. Organic farm produce means the produce obtained from organic agriculture, while organic food means food products that have been produced in accordance with specified standards for organic production, as per the draft.

Conclusion

Organic food has truly exploded in the Chennai city market, but there are still many challenges plaguing the small scale industry that an entrant should be aware of, yes as an authorized merchant or retailer or distributor or stakeholder or even the consumer or customer, 5 things to keep in mind while venturing into organic and herbal products business in India

1. Market opportunity
2. Understanding your target audience
3. Growth opportunity
4. Challenges and policy changes, and
5. Selection of good quality of organic and herbal products

Overall to conclude, all in all, all the players, who are present as well as those who plan to enter this sector need to work mutually and in a cohesive manner to build a sustainable ecosystem and growth opportunities to build up a strategic transformations among the other markets.

Discussion

Organic products have brought change in the current Chennai city market. Consumers have also diverted more towards organic and herbal products, which has brought change in the current market scenario. By analyzing this study, it shows that consumer behavior plays an important role in buying organic and herbal products. By conducting a systematic questionnaire for the retailers, it can be said that organic products have brought change in the retailer, distributor and stakeholders business, even they are aware about organic and herbal products and its business. They also have a positive attitude towards it since the city people are more aware of the healthy lifestyle and some go green anthems. The study brought out the fact that distributors consider the importance of the product they sell to the customers and reflect the change in customer’s attitude to the preference of organic products. Earlier organic products were new to the market but now a days due to change in the customer’s behavior and attitude has brought some good result in their business and profit has been also considerably raised with a lower investment and appropriate registration in micro and small scale industries at the same time due these business the government has lifted up several
people lives in building their own interest of selling homemade and handmade organic and herbal products.

**Ethical Clearance:** Since the article studies about online promotion on herbal products there is no need of clearance.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCES**


Mindfulness Training for Adolescents with Attention Deficit Hyperactivity Disorder

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ABSTRACT

Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most common childhood psychological disorders which are characterized by hyperactive/impulsive and inattentive symptoms. Mindfulness training is one of the emerging intervention programs for the treatment of ADHD. Current study aimed at examining the influence of mindfulness training on ADHD. 10 adolescents were recruited based on inclusion and exclusion criteria using purposive sampling method. The study included experimental single group Pre-Post design and intervention was based on mindfulness training consisting of 10 sessions. The participants were assessed with ADHD Rating Scale-V, at before and after the intervention. Descriptive statistics and Wilcoxon signed ranks test were used. Significant reduction in ADHD symptoms was observed after the intervention.

Keywords: Attention Deficit/Hyperactivity Disorder; Mindfulness; Adolescents; Experimental single group Pre-Post design

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a common childhood psychological disorder, characterized by hyperactive-impulsive and inattentive symptoms with a prevalence rate of 5% which vary by community, and in Indian scenario it was 8 to 17%. It’s a physiological condition which may be found to be present at birth but noticeable symptoms was observed early in childhood. Due to the highly energetic, easily distractible, and impulsive behaviour in children it is difficult to diagnose ADHD before the age of five. So the diagnosis is done at the age of 7-8 years. However the severity of symptoms decreases as children grow older. But it has serious effects on academics, careers and increase vehicle accidents.

The most common treatments for ADHD includes stimulant medication (42%) and psychosocial interventions (32%) these treatment modalities had various limitations, so professionals believed a combined intervention to be effective and should be routinely employed. Short term improvements was provided by pharmacological Interventions; however these exhibited adverse side effects in children (insomnia, appetite reduction, and irritability), continuous use showed growth suppression in children.

Non stimulant medication does not provide any data regarding its short-term safety and also there is no evidence of long-term benefits. Combined approaches (behaviour therapy and medications) have shown to be effective with several limitations, behavioural approaches focuses on attentional enhancement without considering other domains-impulsivity. Recent studies revealed the effectiveness of mindfulness therapies in children and adolescents which involves comprehensive management of ADHD.

Mindfulness is a type of attention training, evolved from Buddhist tradition and Western knowledge of psychology, which focus on the awareness of the present moment and increases non-judgmental observation while automatic responding is reduced. Mindfulness in children is acceptable and feasible research in this area ‘has barely begun’ highlighted a number of areas where differences may occur after mindfulness training, in terms of attentional, cognitive and interpersonal functioning. Accordingly, the delivery of mindfulness teaching to children and adolescents should be developmentally appropriate.

Due to the limitations of the current treatment procedures, researchers are trying to develop other treatment modalities. A study assessed the effects
of mindfulness training on children with ADHD and reported that parent-rated ADHD symptoms of both the children and themselves were significantly reduced. Another study conducted for analyzing the effectiveness of mindfulness training for adolescents with ADHD and found improvements in attention.

The rationale for using a mindfulness approach in ADHD is built on several levels of potential impact, including symptoms like inattention and impulsivity, associated neuro cognitive deficits of attention and inhibition. During mindfulness training, participants learn to reduce arousal through breathing and relaxation exercises and they develop an openness and acceptance to their emotional experiences. It teaches engagement in emotional states in a way that is avoidance, flooding, nor dissociation but rather “mindfully observing and being with the emotion.” Reduction in negative affective reactivity and volatility in response to aversive visual stimuli or emotionally provocative events have been reported with the induction of a mindfulness state. Based on these results, the mindfulness training for adolescents with ADHD is an effective approach and current study assess the influence of Mindfulness training on adolescents with ADHD.

Method

The study design used was experimental single group pre – post design. The independent variables used were mindfulness and dependent variables as attention, hyperactivity – impulsivity and total ADHD symptoms. 10 adolescents sample were selected from schools in Kannur district, those who met the criteria for ADHD by means of purposive sampling method.

The inclusion and exclusion criteria were followed as the age between 12 -14 years, diagnosis of ADHD and able to comprehend English/Malayalam instructions. The exclusion criteria were the children with Mental Retardation, Pervasive Developmental Disorder, Seizure Disorder, children who have undergone any Psychological/ pharmacological treatment in the last 6 months.

The intervention was in a group format and through homework regular practice was confirmed. Post assessments were repeated after completing the 10 sessions of training. The data was treated using the Statistical Package for Social Sciences (SPSS version 16.0). Descriptive statistics and Wilcoxon signed ranks test were used.

Result and Discussion

The main objective of the study was to find out the influence of mindfulness training on symptoms of children with ADHD. The results are presented in table No 1, 2 and 3.

<table>
<thead>
<tr>
<th>Phase of Assessment</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>10</td>
<td>14.300</td>
<td>4.595</td>
<td>-2.814**</td>
</tr>
<tr>
<td>Post</td>
<td>10</td>
<td>8.200</td>
<td>3.705</td>
<td></td>
</tr>
</tbody>
</table>

**significant at 0.01 levels

The tools were ADHD Rating Scale – V: Parents version. Age range 4–20 years, comprises 18 items of 4 point scale. It has a standardized norm and gave percentile score for attention, Hyperactivity and impulsivity and total score. Test’s coefficient alpha were 0.92 (total score), 0.86 (inattention) and 0.88 (hyper activity- Impulsivity) in home version. The test has good predictive and discriminant validity and Standard Progressive Matrices for assessing intellectual functions; it is intended for adults and children from 12 years, including 60 items grouped into five sets. Test has a split half reliability of 0.84 and factorial validity of .83.
Result presented in table: 1 shows the mean, Standard Deviation and Z score of the Pre-Post assessment of inattention before and after the intervention. In pre assessment the mean and standard deviation (SD) score of the participants were 14.300 and 4.595 respectively and in post assessment it was 8.200 and 3.705 respectively. The Z score was -2.814 and it was significant at 0.01 levels. The result revealed that the mindfulness training was effective in improving attention of adolescents with ADHD. The basic purpose for incorporating mindfulness-based approach in ADHD is based on different potential impact (e.g. behavioral symptoms of inattention and impulsivity). The mindfulness practice involves three steps. Bringing attention to an “attentional anchor” is the first step; identifying the distractions and letting go of it is considered as the next step and finally redirecting focus of attention back to the attentional anchor. These steps are repeated many times and this creates an open awareness or hovering attention which is stabilized in the primary practice and other aspects of attention was emphasized.\(^{19}\) In continuing sessions the participants were instructed to pay attention to attention and bring it to the present moment. It helps to decrease the inattention symptoms of adolescents with ADHD.

Result presented in Table: 2 show the mean, Standard Deviation and Z score of the Pre-Post assessment of hyperactive–impulsive before and after the intervention. In pre assessment the mean and standard deviation (SD) score of the participants were 13.400 and 5.985 respectively and in post assessment it was 8.700 and 5.207 respectively. The Z score was -2.818 and it was significant at 0.01 levels. The result revealed that the mindfulness training was effective in improving hyperactivity-impulsivity symptoms of adolescents with ADHD. Breathing and relaxation exercises in mindfulness training help the participants to reduce arousal and develop an openness and acceptance during emotional situations. Mindfulness training teaches the participants to engage themselves in emotional states not by avoidance, flooding or dissociation but by mindfully observing and being with the present emotions. Disengagement from intense emotional states is done by shifting attention to a neutral focus. Through this process the child acquire the capacity to regulate the emotions and reducing the impulsive behaviours. The improvement in impulsive behaviour was also presented in a study.\(^ {33} \)

Result presented in Table: 3 show the mean, Standard Deviation and Z score of the Pre-Post assessment of ADHD total symptoms before and after the intervention. In pre assessment the mean and standard deviation (SD) score of the participants were 27.700 and 8.807 and in post assessment it was 16.600 and 8.501 respectively. The Z score was -2.807 and it was significant at 0.01 levels. The result revealed that the mindfulness training was effective in adolescents with ADHD. Internal and external stimuli (for example thoughts and sounds) have a great effect on children with ADHD when they are bored or is doing any difficult tasks and they fail to bring back their attention to the previous activities.\(^ {1} \) In mindfulness practice, an attention anchor (body or breath) is given so that the child focuses their attention on it to observe the wandering of their mind and through this their ability to control and sustain attention was increased.\(^ {38, 21, 32} \) They are also taught to observe and become aware of the internal and external stimuli without any automatic signals. These aspects target on symptoms like hyperactivity and impulsivity. In mindfulness sessions children are observed to get
distracted easily due to their curiosity to know how other children are doing and these impulses are beyond a child’s control. However, the children’s attention is directed to the impulses and they realize their automatic behaviors and they can develop the capacity to select how to respond to the internal or external stimulus. This develops their skill to regulate the impulsivity-hyperactive behavior. Mindfulness is used as a treatment option in ADHD due to its increased capability of controlling attention and improving self-regulation.

Even though the result in various studies showing the inconsistency in the results, the researchers suggest mindfulness reduces primary symptoms of ADHD (inattention and hyperactivity). Current study also shows the reduction in ADHD symptoms after the mindfulness training.

**Conclusion**

Mindfulness training involves the practice of creating awareness of their attention as well as decreasing the automatic responses among children which helps them to focus their attention when distracted and have a control over their hyperactive and impulsive responses. This aids them to sustain their attention for a longer period. Results from the current study demonstrated that mindfulness is an effective approach and may have a potential for treating ADHD symptoms among adolescents.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from Departmental ethics committee, School of Behavioural Sciences, Kannur University.

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Development and Validation of a Neck Pain Risk Factor Questionnaire

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ABSTRACT

Background: Neck pain is the second most prevalent musculoskeletal symptom but is not given its due importance and is being assessed mostly with other musculoskeletal symptoms. The purpose of the current study was to develop a questionnaire for assessing factors associated with increased incidence and prevalence of non-specific neck pain.

Method: A questionnaire for evaluation of risk factors associated with Non-Specific Neck Pain” (QERNP), has fifty-nine items designed by a detailed literature review and comprehensive collaboration with two academicians and neck pain participants. The questionnaire was tested on 200 participants. The two sections of the questionnaire assess the demographic characteristics, previous relevant history and four domains of the hypothesised risk factors, being occupation, personal electronic device usage, physical activity/inactivity, sleep and stress. Further additional questions are regarding presence and influence of neck pain on the individual. The psychometric properties were analysed by establishing validity and reliability through Principal Component Analysis with varimax rotation, calculation of Cronbach’s alpha and item-total correlations.

Results: Twelve factors came into existence explaining 30-40% of the total variance. Lack of redundancy of items and reliability was provided by calculation of Cronbach’s alpha and cross validation.

Conclusion: QERNP has satisfactory validity and reliability and is capable of being used in documenting the risk factors associated with neck pain.

Keywords: Neck pain, risk factors, questionnaire, validity, reliability

Introduction

The global yearly prevalence for neck pain is ranging from 16% to 75%¹. However, in the recent decade the incidence and prevalence has been on the rise. It could partly be hypothesised because of increased use of computers²,³,⁴,⁶,⁷,⁸,⁹, mobile phones⁵,¹⁰,¹¹ and tablets³ for communication, entertainment, education and work¹⁰,¹¹. The economic growth and ready availability of these electronic devices has led to a compromise of physical fitness and a more sedentary lifestyle¹², especially in the urban parts of India. Other factors contributing to the increase prevalence are the extensive, inactive job demands of the modern culture⁶,⁸,¹³, which include awkward static postures³,⁶,⁷, and repetitive activities⁸,¹⁴. Neck pain further has serious economic consequences¹⁵.

In the current study through review of literature we have identified four domains which have the potential of being a risk factor for development of non-specific neck pain. These include occupation, personal electronic device usage, physical activity, sleep and stress. Demurring the above risk factors, it is rational to hypothesise that, the evaluation of the association of the various lifestyle modifiable risk factors with the intensity and impact of neck pain, would contribute towards a better understanding and development of preventive neck pain strategies. Although, remarkable battery of tests

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and scales are available to measure and assess neck pain. However, we were incapable of finding a reliable and valid tool which could help us study the association of the above-mentioned risk factors with non-specific neck pain. Thus, the aim of the current study is development of a valid and reliable questionnaire which will help us understand the association of modifiable risk factors the urban, technological, sedentary Indians are subjected to with non-specific neck pain.

Materials and Method

Instrument: “A questionnaire for evaluation of risk factors associated with Non-Specific Neck Pain” (QERNP) is intended to evaluate the possible risk factors for neck pain. The QERNP is a self-administered tool, made in English language, for which multiple choice and dichotomous questions were chosen as pattern

Phase I: The original questionnaire is composed of two sections. The first phase of development included a thorough literature review (described elsewhere) and a detailed interaction with two other academicians and two neck pain participants, leading to the structure and frame of the instrument. The panel was asked to rate the significance each of the items on a three-point scale. Items which were rated as not significant by two or more in the panel were deleted.

Phase II: The questionnaire was pilot tested on 50 participants. Based on the feedback of the participants and principle component analysis the suitable modifications and refinements were made. An online link for the questionnaire was developed on “Google forms”, an obligatory informed consent check box was added in the same link. The online link was tested on ten participants to check for the feasibility of getting responses. It was observed that the participants took approximately fifteen mins to complete the online questionnaire as opposed to twenty minutes in the hard copy. It also gave an option of using section-based responses, thus was more flexible and saved time.

Phase III: The Final QERNP: After the modifications the final QERNP was tested on 200 participants. Neck region was demonstrated using picture of pre-shaded manikin picture. Participants were asked to ignore pain in any other region. Section A of QERNP has nineteen items which record the demographic details. All items are compulsory to be answered. It also includes questions regarding any chronic medical diseases, previous trauma/injury/surgery of neck and shoulders. Section B of QERNP has forty items which record work, computer/mobile/tablet/iPad usage, sleep, stress physical activity and neck pain. The “Questionnaire for evaluation of risk factors associated with non-specific neck pain” is registered for copyright with the Government of India by the registration number L-70226/2017 on 15/11/2017.

Participants: As the development QERNP is a part of another study, the participants were in the age group of 18 to 35 yrs., could read and write in English language and cleared class tenth. Also, any participants with history of smoking, diseases affecting the musculoskeletal system, any previous surgical procedure involving the spine or upper musculoskeletal extremity, severe neck/shoulder trauma, medical history chronic diseases and pregnancy were not included. The study was approved by the ethical committee of Amity University, Uttar Pradesh. The online link of QERNP was alive from March 2017 till May 2017.

Data Analysis

The QERNP validity and reliability was established in three courses. The first course involved assessment of content validity, which was established by thorough discussion and item ratings with two other academicians with excellent knowledge in the domain and two neck pain patients. The second course comprised of establishment of construct validity by exploratory factor analysis. Also, item-total correlations were calculated for all factors identified above, a value between 0.2 and 0.5 was accepted. The third course involved calculation of reliability, by calculation of Cronbach’s alpha [16]. The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0.

Results

Characteristics of the sample: We received 209 completed online responses, from which 9 responses were not included as they did not meet the selection criteria. As the link of the questionnaire was circulated via social media and mail, we could not determine the response rate of it. Total of 200 responses were evaluated. Table 1 shows the demographic details of the participants. The mean age of the participants was 24.04 (± 4.97) and the mean Body mass Index was 22.89(± 3.94).
Table 1: Descriptive Characteristics of the sample population

<table>
<thead>
<tr>
<th>Descriptive Characteristics</th>
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<td>Age (in years)</td>
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<tr>
<td>15-25</td>
<td>139</td>
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<tr>
<td>26-35</td>
<td>61</td>
<td>30.50%</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Male</td>
<td>72</td>
<td>36.00%</td>
</tr>
<tr>
<td>Female</td>
<td>128</td>
<td>64.00%</td>
</tr>
<tr>
<td>Marital Status</td>
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<td></td>
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<tr>
<td>Unmarried</td>
<td>154</td>
<td>77.00%</td>
</tr>
<tr>
<td>Married</td>
<td>46</td>
<td>23.00%</td>
</tr>
<tr>
<td>Complaint of neck pain/stiffness in the past year</td>
<td></td>
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</tr>
<tr>
<td>No</td>
<td>111</td>
<td>55.50%</td>
</tr>
<tr>
<td>Yes</td>
<td>89</td>
<td>44.50%</td>
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</tbody>
</table>

Validity: Exploratory factor analysis was preferred as it allows the investigation of the interrelations between large number of items, explaining at the same time the mutual primary proportions within the four domains. Principal Component Analysis with varimax rotation was used to split the items into factors. Kaiser’s eigenvalue rule (>1), extracted percentage of variance, item content and resulting factors interpretability was used to decide the number of factors that will be retained. Also, items with a factor loading <0.5 on all factors were excluded. We have exemplified the factors and the loaded items on them. The factors are interpreted by the content of the items.

Cross validation: Absence of redundant items and reliability was further provided by cross validation. It revealed that the factors identified, their edifice, and loadings were comparable for the greater part among the first randomly formed sub-sample (n=50) and complete sample (n=200). Contrasts were identified found in personal electronic device usage. That may be due to decrease in sample size in subset. Apart from this no variations originated between the sub-sample and complete sample.

Reliability: Cronbach’s alpha coefficients were calculated as a measure of internal consistency, to represent whether the items in the domain appraise the same notion and are inter-related or not. The alpha value in the twelve factors ranged from 0.1 to 0.9. In addition, inter-item correlations are also calculated for all the twelve factors (Table 2).

Table 2: Internal Consistency and Inter-Item Correlations of the Six Domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>Cronbach’s Alpha</th>
<th>Inter-Item Correlations</th>
<th>Loaded Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td>Factor 1</td>
<td>0.370</td>
<td>Working hrs/week</td>
</tr>
<tr>
<td></td>
<td>Factor 2</td>
<td>0.268</td>
<td>Duration of the present job</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Time spent on household work</td>
</tr>
<tr>
<td>Use of personal electronic device</td>
<td>Factor 3</td>
<td>0.637</td>
<td>Type of computer used</td>
</tr>
<tr>
<td></td>
<td>Factor 4</td>
<td>0.7</td>
<td>Posture adopted while using computer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.361 to 0.578</td>
<td>Hrs/day of computer usage</td>
</tr>
<tr>
<td></td>
<td>Factor 5</td>
<td>0.322</td>
<td>Hrs/session spent on sitting in front of computer without moving much</td>
</tr>
<tr>
<td></td>
<td>Factor 6</td>
<td>0.464</td>
<td>Height of monitor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.160 to 0.335</td>
<td>Height of the keyboard and mouse</td>
</tr>
<tr>
<td></td>
<td>Factor 7</td>
<td>0.367</td>
<td>Hrs/day of mobile usage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.229</td>
<td>Posture adopted while using mobile phone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Posture adopted while using Tablet/iPad</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Distance between chin and chest while using Tablet/iPad</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Distance between chin and chest while using mobile phone</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Physical activity/inactivity</th>
<th>Factor 8</th>
<th>0.73</th>
<th>0.499 to 0.596</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 9</td>
<td>0.145</td>
<td>0.007 to 0.085</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sleep and stress</th>
<th>Factor 10</th>
<th>0.336</th>
<th>0.107 to 0.489</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 11</td>
<td>0.762</td>
<td>0.336 to 0.518</td>
<td></td>
</tr>
<tr>
<td>Factor 12</td>
<td>0.95</td>
<td>0.363</td>
<td></td>
</tr>
</tbody>
</table>

### QERNP – Psychometric Properties

#### Occupation
Occupation domain constituting the first group with four items was split in two factors by factor loadings and orthogonal VARIMAX rotation. The Factor loadings on all four items were more than 0.7 in either factor 1 or factor 2, thus were retained. The occupation domain met Kaiser’s eigenvalue rule (>1). The extracted percentage of variance was 30.92 for Factor 1 and 29.358 for Factor 2.

#### Use of Personal Electronic Items
Twelve items of the second domain loaded satisfactorily on five factors. Items loaded on Factor 3 included type of computer used and posture adopted while using computer with a rotated factor loading value >0.7. Hrs/day of computer usage, hrs/session spent on sitting in front of computer without moving much and hrs/day of Tablet/iPad usage loaded on Factor 4 with a value >0.6. Factor 5 has height of monitor and height of the keyboard and mouse loaded onto it with a value of >0.59. Factor 4 included hrs/day of computer usage, hrs/session spent on sitting in front of computer without moving much and hrs/day of Tablet/iPad usage with values > 0.65. Two items height of monitor and height of the keyboard and mouse constituted Factor 5 the factor loading value being >0.59. Factor 6 had hrs/day of mobile usage, posture adopted while using mobile phone and posture adopted while using the Tablet/iPad loaded on to it, with value >0.46. Distance between chin and chest while using Tablet/iPad and mobile phone loaded on Factor 7 with value >0.59. The use of personal electronic devices domain also met the Kaiser’s eigenvalue rule (>1). The extracted percentage of variance ranged from 10.20 to 16.14%.

#### Physical activity/inactivity
The physical activity/inactivity was investigated by seven items. The orthogonal VARIMAX rotation, indicated that indulgence in physical exercise, frequency of physical exercise/week and average duration of exercise/session loaded on Factor 8 with a value more than 0.79. Factor 9 had hrs/day of Television/movie watching and posture adopted while watching Television/movie loaded satisfactorily on it with value >0.5. Self-fitness rating and increase in sweating and breathing during the physical activity session were also found to be loaded on to factor 9, but with less than 0.5 values. Overall the physical activity/inactivity domain had met the Kaiser’s eigenvalue rule (>1). The extracted percentage of variance ranged from 16.06 to 32.14%.

#### Sleep and stress
Ten items investigated the relationship of sleep and stress on young individuals. Factor 10 had position while habitually going to sleep, position while habitually going to sleep, position maintained mostly while sleeping, no. and type of pillows used, troubled by difficulties in falling asleep, troubled by repeated awakenings with difficulties going back to sleep, troubled by feeling of stress, tension, restlessness, work/personal pressure, anxiety or nervousness which makes falling asleep difficult, feeling of depression, average duration of sleep and getting sufficient sleep.
maintained mostly while sleeping number and type of pillows used loaded satisfactorily on it with a value more than 0.5. Troubled by difficulties in falling asleep, troubled by repeated awakenings with difficulties going back to sleep, troubled by feeling of stress, tension, restlessness, work/personal pressure, anxiety or nervousness and feeling of depression load with a value of >0.69 on Factor 11. The last Factor 12 had average duration of sleep and getting sufficient sleep loaded on to it with a factor loading value >0.73. But in totality the overall sleep and stress domain had met the Kaiser’s eigenvalue rule (>1). The extracted percentage of variance ranged from 12.219 to 26.819%.

Discussion

We endeavoured to inspect accurately the validity and reliability of our newly developed tool QERNP. This tool will help in collection of data about the hypothesized risk factors associated with non-specific neck pain, in the contemporary Indian population. The present day urban Indian population is being subjected to, immense exposure to the technology\textsuperscript{17}, physically indolent lifestyle\textsuperscript{18}, psychological work pressure and sleep disturbances\textsuperscript{19}. The present tool tries to incorporate these issues.

Conclusion

We developed a risk assessment tool QERNP to assist is assessment of risk factors associated with non-specific neck pain. The designed tool has acceptable validity and reliability for urban young adults and shows promising capability to be used as a screening inventory by ergonomists, employers, colleges and schools for assessment of various risk factors and later in designing preventive protocols for neck pain.

Conflict of Interest: The developed tool “Questionnaire for evaluation of risk factors associated with non-specific neck pain” is registered for copyright with the Government of India by the registration number L-70226/2017 on 15/11/2017. But we are not receiving any royalties for it.

Source of Funding: The study was funded and supported by the authors.

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Influence of Jacobson’s Progressive Muscle Relaxation Technique among Primipara Women with Postpartum Blues

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¹Intern, ²Department of Community Health Sciences, Faculty of Physiotherapy, Krishna Institute of Medical Sciences ‘Deemed To Be’ University, Karad, Maharashtra, India

ABSTRACT

Introduction: In the first few days after delivery, mothers can present symptomatology of postpartum blues (PPB): fatigue, anxiety, insomnia, and mood swings. Depression during the PPB is accountable for 80% of all postpartum depression. Women commonly report an increase in fatigue during postpartum which may contribute to depression.

Aim & Objective: To find the influence of Jacobson’s progressive muscle relaxation technique (JPMRT) among primipara women with postpartum blues. To assess the pre-test and post-test measures with Blue’s Questionnaire (BQ) and Vertical Numerical Fatigue Rating Scale (NFRS) among primipara women screened for postpartum blues and to assess the difference between pre-test and post-test values of BQ and Vertical NFRS resulting out of JPMRT

Method: A total of 54 primipara women who delivered normally within the age group of 20-30 years, were selected and pre-test assessment was done using both the outcome measures and Jacobson’s progressive muscle relaxation technique was incorporated for 2 weeks. The later post-test assessment was done to find if any significant difference was seen.

Result: A total of 54 primipara mothers within age groups of 20-25 years (22.27 ± 1.78) & 25-30 years (27.30 ± 1.26) participated in the study. Statistically, this study shows that there was a considerable change in the outcome measures used, with significant difference seen in the postpartum blues (p-value <0.0001) and fatigue levels (p-value <0.0001).

Conclusion: As per the results of this study, we conclude that, Jacobson’s progressive muscle relaxation technique was significantly effective in reducing postpartum blues.

Keywords: childbirth, postpartum blues, postpartum depression, primipara women, fatigue, relaxation technique.

Introduction

The postpartum or postnatal period is about a total of 6-8 weeks, it begins right from an hour after the childbirth. It is mainly divided into, an early postpartum period which is the three weeks after childbirth and the later postpartum which is the four to six weeks after childbirth.¹ During this time, three psychiatric disorders can arise namely, PPB/maternity blues, post-partum depression (PPD) and also post-partum psychosis.¹,²

PPB are usually denoted as a brief psychological disturbance in mothers during the first few days after childbirth as the mother is in the stage of puerperium and trying to adapt to the new surrounding around her.³ It’s defined as, “a brief mood disorder, occurring within first day to 6 weeks after delivery, and it’s characterized by episodes of sudden mood swings, unexplained crying, irritability, impatience, insomnia, feeling of being vulnerable, loneliness, mild depression, anxiety, fatigue, and labile emotion.¹,⁴,⁵,⁶,⁷” It has a global occurrence of 300-750 per 1000 mothers.⁴ Its prevalence was found...
to be 58.5%.[6] Depression during the PPB is accountable for 80% of all PPD. [1] The precise reason for PPB is unknown, but various factors associated may include, economy, socio-cultural factors, relationship conflicts and hormonal changes. [3]

PPD usually starts between 2 weeks to a month after the delivery. [1] Prevalence of PPD is 22% with an incidence of 100-150 per 1000 births. [3] Post-partum psychosis is that which occurs within 4 weeks of post-partum and hospitalization may be required; it has a global occurrence between 0.89 to 2.6 per 1000 births, which occurs within four weeks of postpartum and requires hospitalization. [3] The neuro-chemical etiologies of the blues are not certain; only two small studies were found to have an association between low serum progesterone (including allopregnanolone) levels at day 2–3 and the maternity blues. [7]

A common symptom of all types of depression is fatigue; it’s extremely prevalent in postpartum women (Pugh & Milligan, 1995). Aaronson et al. has defined fatigue as “the awareness of a decreased capacity for physical and/or mental activity due to an imbalance in the availability, utilization, and/or restoration of resources needed to perform activity”. In particular postpartum fatigue, is often viewed as a normal result of the physical alterations and urge of motherhood. Amount of fatigue has increased from 20% presumptuously to 50% - 64% among women in immediate postpartum (Lee & Zaffke, 1999; Whiffen, 1992). Women on their own have rated exhaustion in the top 4 contributing factors to postpartum depression (Small et al., 1994). Fatigue was recorded to be enormous in majority of women experiencing postpartum depression (Caltabiano, 1996; Whiffen, 1992). [8,9,10]

JPMRT includes the method of sequentially tensing and relaxing the main group of skeletal muscle. It decreases arousal of the central and autonomic nervous system and to increase parasympathetic activity. They last commonly for about 20 to 30 minutes. [1,11]

Moreover, no study is done to date to check the influence of JPMRT among primipara women with PPB, hence this study is being done.

Materials & Method

This experimental study was conducted at the Physiotherapy department of Krishna Hospital and Research Centre in Karad city. The research study was done for a period of 3 months from 12th November 2018 to 12th February 2019. The study population included were 54 primipara women screened for postpartum blues who were selected by purposive sampling method.

Sample size and sampling: A sample size of 54 was calculated by the statistician with the reference of the mean and standard deviation of a study done using relaxation exercises. [1] Data was collected and the overall procedure of the treatment was supervised by the faculty in charge. The data collected and the proforma was checked by the faculty in charge of quality assurance.

Inclusion Criteria: 1) Age group: 20-30 years. 2) A postpartum female who has undergone normal delivery. 3) Primipara mothers.

Exclusion Criteria: 1) Mothers whose babies are in the neonatal intensive care unit. 2) Postpartum hemorrhage. 3) Mothers of babies with birth trauma. 4) Mothers with stillbirth. 5) Mothers with past psychiatric history.

Outcome Measures:

1. Blue’s Questionnaire: It is a well-known questionnaire for the screening of postpartum blues during the postpartum period. It comprises 28-questions, each having a score of 0-3, with minimum of 0 and maximum of 28 points respectively. This scale is validated in many countries and its reliability is found to be 0.84-0.94. [12]

2. Vertical Numerical Fatigue Rating Scale: It is a well-known tool for the screening of fatigue. It comprises of a vertical scale with numerical marking of 0-10, with minimum score of 0 and maximum of 10 respectively. The inter-rater and intra-rater reliability of Vertical Numerical Fatigue Rating Scale is 0.92 and 0.96 respectively. Hence it has an excellent validation and can be used to assess fatigue in postpartum blues. [13]

After the Ethical clearance was approved, subjects were approached and those fulfilling the inclusion criteria were selected. Procedure of the study was explained and written informed consent was taken from those willing to participate. General Data of the subjects was taken; they were informed about the treatment. Each of them underwent a pre-test assessment for postpartum blues and fatigue with the outcome measures before JPMRT was given later post-test assessment was done using both the same outcome measures. Both the data were recorded. Statistical analysis was done to find the results.
Results

A total of 54 primipara mothers within age groups of 20-25 years (22.27 ± 1.78) & 25-30 years (27.30 ± 1.26) participated in the study [Table 1]. Statistically, this study shows that there was a considerable change in the outcome measures used, with significant difference seen in the postpartum blues (mean diff= 10.87, p-value <0.0001) and fatigue levels (mean diff= 5.54, p-value <0.0001) [Table 2]

Table 1: Age Distribution

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No. of Subjects</th>
<th>Mean ± SD</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-25</td>
<td>34</td>
<td>22.27 ± 1.78</td>
<td>63</td>
</tr>
<tr>
<td>25-30</td>
<td>20</td>
<td>27.30 ± 1.26</td>
<td>37</td>
</tr>
</tbody>
</table>

Table 2: Pre and post measures of BQ and vertical NFRS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Pre Mean ± SD</th>
<th>Post Mean ± SD</th>
<th>Mean Diff</th>
<th>t Value</th>
<th>p Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>BQ</td>
<td>23.89 ± 2.39</td>
<td>13.02 ± 3.71</td>
<td>10.87</td>
<td>17.26</td>
<td>&lt;0.0001</td>
<td>ES</td>
</tr>
<tr>
<td>NFRS</td>
<td>8.32 ± 1.15</td>
<td>2.78 ± 1.39</td>
<td>5.54</td>
<td>21.30</td>
<td>&lt;0.0001</td>
<td>ES</td>
</tr>
</tbody>
</table>

Discussion

The riskiest time for mental and psychological disorders is the postnatal period; it includes sadness, depression, and psychosis. It’s associated with intense physical and emotional changes as the mother is going through puerperium which leads to fatigue and mood disturbances, in more than 60-80% cases of PPB they can evolve into PPD as time progresses mostly after 2 weeks of postpartum. In a review given by Upadhyay et al. (2017) showed a higher prevalence of PPD in Indian mothers of 22%, quoting more resources are needed for a capacity-building of maternal mental health care in India. A systematic review of done in 11 high-income countries showed the prevalence to be around 12.9% of mothers depressed at 3 months of postpartum. PPD is the most common and it can disturb the relationship of the mother with her baby and family, in the absence of required attention and treatment may lead to irreparable damages. Henshaw et al. (2004) confirmed that the earlier work and establishes that severe PPB can independently predict PPD in time mothers.

In this study, 54 primipara women subjects between the age group of 20-30 years fulfilling the inclusion criteria were included [Table 1]. They were screened for PPB and the amount of fatigue associated with it. Kennerley and Gath(1989) mentioned in their study that, PPB are been commonly reported in primipara women (Yalom et al. 1968; Nott et al. 1976). A study was conducted to determine the effect of relaxation exercises on PPD among 30 postpartum women aged 20-35 years, it concluded that relaxation exercises are easy to perform, safe, have no side effects on reducing PPD and elevating female mood and enhancing the coping up skills for stressful conditions.

A study reviewed that PPB and fatigue go hand in hand. Fatigue is one of the most common complaints experienced during the postpartum period. NANDA defined fatigue as; “experiencing a constant feeling of exhaustion that never gets over by resting and decreases the physical and mental working capacity” (Thompson et al. 1989; Carpenito 1999).

The treatment of JPMRT in this study consisted of a 2-week protocol which was given to the mother from day 2 of her postpartum, in which the outcome assessment was done before and after the treatment. Karbandi et al. (2017) did a study at 24-72 hours of postpartum to check the effect of Jacobson’s PMRT in mother’s having difficulty in breastfeeding; was given for 30-45 mins, the results were found to be statistically significant, whereas to have a positive influence and an inexpensive technique to improve the mother’s health, particularly mothers with pre-term infants.

Our study showed that there were considerable changes with significant difference seen in PPB symptoms and fatigue levels in primipara women, as we analyzed that the changes in blue’s questionnaire and vertical numerical fatigue rating scale for screening PPB, before and after incorporating JPMRT [Table 2].
In a study done by Nasiri, progressive muscle relaxation and guided imagery were used to see its effect on stress, anxiety, and depression (76.9%) in pregnant women referred to health centers, the results showed a significant difference in the mean scores after and before the intervention in stress, anxiety, and depression in pregnant women at 4 and 7 weeks through these exercises. Akbarzadeh et al. (2013) in Shiraz studied the effect of relaxation and attachment behavior training on anxiety in the nulliparous women, for 4 weeks, at the end the results showed a significant difference between anxiety scores. A study done by Chambers showed that relaxation and self-care act in reducing the negative mood in women with high stress in the gestational age of 14-28 weeks. The study of Urech et al. found that both guided imagery and progressive muscle relaxation can help reduce the heart rate, it was found that a variety of relaxation techniques can have different effects on the biological systems and psychological stress of individuals.

This study showed has a positive influence among primipara women with postpartum blues. And results were found to be statistically significant by the use of both the blue’s questionnaire as well as vertical the numerical fatigue rating scale.

**Limitation:** The limitation of this study was that it evaluated the effect of JPMRT within a short period of 2 weeks of postpartum.

**Recommendations:**
1. Studies with larger sample size.
2. A comparative study between normally delivered and c-section delivered mothers.
3. Increase in the treatment duration to find further results.
4. Long term follow up may prove the efficiency of the treatment.

**Conclusion**

The present study provided enough proof supporting the use of Jacobson’s Progressive Muscle Relaxation Technique in reducing the postpartum blues and the fatigue associated with it among primipara women. In addition, results supported that it was statistically significantly effective in reducing the number of postpartum blue symptoms and fatigue in improving their quality of life.

**Acknowledgment**

We acknowledge the guidance and support from faculty of physiotherapy. Also express my most humble and profound gratitude to my respected Dean Dr. G. Varadharajulu, Dean, Faculty of Physiotherapy, KIMSDTU for his inspiration, motivation, valuable guidance and suggestions throughout this project.

**Ethical Clearance:** Taken from the Institutional Ethical Committee of KIMSDTU.

**Source of Funding:** Self funded.

**Conflict of Interest:** Nil.

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Antimicrobial Profile and Antibiotic Susceptibility of Neonatal Sepsis in Neonatal Intensive Care Unit of Tertiary Care Hospital of North India

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ABSTRACT

Background: Neonatal septicemia is the cause for 20% of neonatal deaths in the world and is more prevalent in developing nations. The main cause of concern is the development of multiple drug resistance strains in Neonatal intensive care units (NICU). The mainstay of treatment for both empirical and definitive therapy is based on rapid identification of these MDR strains and their antibiotic susceptibility that helps the clinicians in further successful management of septicemia in these patients.

Objective: To determine the antimicrobial profile of culture-positive neonatal sepsis and its antibiotic susceptibility patterns.

Material & Method: The blood culture and relevant data of newborns with culture positive neonatal sepsis were reviewed retrospectively. The data were collected from records of babies admitted in NICU of a tertiary health setup.

Results: There were a total of 882 neonatal admissions, of which 141 neonates with culture positive sepsis were reviewed retrospectively. The average gestational age of newborns was 34.5 ± 3.4 weeks and the average birth weight was 1849 ± 665 gms. Most common organism isolated was Enterobacter Spp. 61 (43.3%), Klebsiella pneumoniae (28.4%), Acinetobacter baumanii (14.9%) and Pseudomonas Spp. (7.1%). Among the least common microorganism was Salmonella typhi, Staph aureus and Citrobacter spp. was 0.7%, 2.1% and 2.1% each respectively. Early onset culture positive sepsis was 44.6% and late onset sepsis was 55.0%. The frequency of pathogens isolated was similar for both early and late onset sepsis. The resistance patterns of antibiotics to pathogens were also similar between early versus late onset sepsis.

Conclusion: Gram negative organisms particularly Enterobacter Spp., Klebsiella Pneumoniae and Acinetobactor baumanii are now predominant organisms causing neonatal septicemia in NICU both in early as well as late onset sepsis. Gram positive organisms are not the common cause of sepsis in our centre.

Keywords: Antimicrobial profile, Antibiotic susceptibility, Neonatal sepsis, Tertiary Care Hospital, onset of sepsis

Introduction

20 % of Neonatal deaths are linked to neonatal sepsis throughout the world. It is far more common in developing countries. Emergence of Methicillin-resistant Staphylococcus aureus (MRSA) and extended spectrum beta-lactamases (ESBLs) and multiple drug resistant strains are a significant threat in Neonatal Intensive Care Units (NICU) in the entire world¹. Septicemia is broadly classified as early onset septicemia (EOS) and late-onset septicemia (LOS).² Most common isolates
associated with EOS include Group B Streptococcus (GBS), E. coli, coagulate negative Staphylococcus species (CONS), Haemophilus influenzae and Listeria monocytogenes. and that with LOS are coagulate negative Staphylococcus aureus, S. aureus, E. coli, Klebsiella spp., Pseudomonas spp., Enterobacter spp., Candida spp., Group B Streptococcus, Serratia spp., Acinetobacter spp. and Anaerobes. The recent studies suggest increasing trends in no of isolates of CONS 3.

In the India it appears in case of Gram negative bacilli such as Escherichia coli, Klebsiella pneumoniae and Acinetobacter spp. Sepsis is the most important factor in the morbidity and mortality associated with NICU patients. For prompt management of sepsis appropriate antibiotic therapy can be started either in culture guided way or as empirical therapy. To avoid deterioration of inherent or heath care related infection, cultures are sent and empirical therapy on the basis of environmental and hospital significance is instituted. We want to determine the prevalence of culture-positive neonatal sepsis, its antibiotic susceptibility profile in the NICU of PGIMS, Rohtak, Haryana.

Material and Method

The study was conducted in the Neonatal intensive care unit of PGIMS, Rohtak, Haryana as retrospective study and data was collected regarding micro-organism profile and their antibiotic sensitivity pattern. Data was collected from neonates admitted in NICU during past six months.

This was a retrospective study conducted in the Neonatal intensive care unit of PGIMS, Rohtak, Haryana.

Inclusion Criteria:

- All blood culture positive neonates with proven sepsis.
- Age ≤ 28 Days.

Exclusion Criteria:

- Newborns with sterile blood culture.
- Neonate with Contaminated culture

Data of total 141 culture positive neonates with septicemia were reviewed retrospectively to get their micro-organism profile and antibiotic susceptibility patterns. Neonatal septicemia was present when one or more of the following signs and symptoms were present: convulsions, respiratory rate >60/min, severe chest indrawing, nasal flaring, grunting, bulging fontanels, pus draining from the ear, redness around umbilicus, temperature ≥37.5°C or ≤36.4°C, lethargy, unconsciousness, reduced movements, not able to feed, unable to attach breast, not suckling, crepitations in lungs, cyanosis and capillary refill time.

The blood culture samples were collected under proper aseptic conditions and before administration of antibiotics as a standard protocol. The culture bottles were transported immediately to the microbiology laboratory of the hospital. They were then further analyzed according to the standard microbiological guidelines and the isolated organisms are identified.

As per Clinical Laboratory Standard Institute guidelines, antibiotic susceptibility testing was performed on Mueller-Hinton agar plates by modified Kirby- Bauer disk diffusion method. Newborn demographics, onset of sepsis and bacteriological profile, antimicrobial susceptibility and their outcome were recorded and analyzed

Statistical Analysis

Statistical analysis was performed using SPSS 20.0 (Statistical Package of Social Sciences, Chicago, IL, USA) software. Data were expressed as the mean ± standard deviation. Data were normally distributed, and paired comparisons were performed by Chi-Square test. The significance level was set at p-value at 5%.

Results

During the six months of the study period, total 141 neonates which were culture positive were further evaluated and studied for antibiotic susceptibility patterns. From the selected 141 neonates, 88 (62.4%) were preterm and 53 (37.6%) were full term.

Mean gestational age was 34.5 ± 3.4 weeks, range 27 to 41 weeks and mean birth weight was 1849 ± 665 gm, range 680 gm to 3500 gm. A majority of neonates were low birth weight (80.1%) and 19.9 % were of normal Birth weight babies.
Table 1: Distribution of Gender among study population

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>72</td>
<td>51.1</td>
</tr>
<tr>
<td>Female</td>
<td>69</td>
<td>48.9</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 1 shows 72 (51.1%), 69 (48.9%) male and female respectively of 141 neonates.

Early onset and culture positive sepsis were 63 (44.6%) and late onset sepsis were 78 (55.0%)

When we compared the onset of sepsis and antibiotic susceptibility pattern of major antibiotics. The resistance pattern, resistance as well as sensitivity of organisms to all antibiotics were similar between early and late onset sepsis.

Figure 1 Distribution of Microorganisms

Figure 1 shows the isolates of microorganism found in the decreasing frequency. The most common microorganism was Enterobacter Spp. 61 (43.3%) followed by Klebsiella pneumoniae (28.4%) and Acinetobacter baumannii (14.9%). Least prevalent microorganism was Salmonella typhi (n=1), Staph aureus (n= 3) and Citrobacter spp.(n=3) was 0.7, 2.1 and 2.1% each respectively.

Table 2: Antimicrobial profile and sensitivity pattern in early and late onset sepsis

<table>
<thead>
<tr>
<th>Antimicrobials, n(%)</th>
<th>Early onset sepsis</th>
<th>Late onset sepsis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Enterobacter n=28)</td>
<td>(Enterobacter n=5)</td>
</tr>
<tr>
<td>Piperacillin-tazobactum</td>
<td>0 (0%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Amoxycillin</td>
<td>1 (3.5%)</td>
<td>2 (40%)</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>0 (0%)</td>
<td>3 (60%)</td>
</tr>
<tr>
<td>Imipenem</td>
<td>4 (14.2%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>Meropenem</td>
<td>6 (21.4%)</td>
<td>5 (100%)</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>Gentamycin, n(%)</th>
<th>Amikacin, n(%)</th>
<th>Doxycycline, n(%)</th>
<th>Ciprofloxacin, n(%)</th>
<th>Trimethoprim-sulfamethaxole, n(%)</th>
<th>Polymixin B, n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (3.5%)</td>
<td>0 (0%)</td>
<td>6/6 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>17/17 (100%)</td>
</tr>
<tr>
<td></td>
<td>1 (20%)</td>
<td>2 (40%)</td>
<td>2/4 (50%)</td>
<td>4 (100%)</td>
<td>4 (80%)</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>2 (10.9%)</td>
<td>2/14 (14.2%)</td>
<td>10/10 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>3/3 (100%)</td>
</tr>
<tr>
<td></td>
<td>0 (0%)</td>
<td>1/1 (100%)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>3 (8%)</td>
<td>2/17 (12%)</td>
<td>9/11 (82%)</td>
<td>2/34 (2%)</td>
<td>2/2 (100%)</td>
<td>15/17 (88.2%)</td>
</tr>
<tr>
<td></td>
<td>3 (23%)</td>
<td>3/5 (60%)</td>
<td>3/3 (100%)</td>
<td>8/10 (80%)</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>1 (5%)</td>
<td>1/13 (7.6%)</td>
<td>3/5 (100%)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>1/6 (16.6%)</td>
<td>0/3 (0%)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
</tbody>
</table>

Early onset sepsis and late onset sepsis shows similar pathogen profile as listed in Table 2.

In Early onset sepsis (EOS), sensitivity of Carbenepems were (38.3%) and Polymixin B were (100%) whereas in Late onset sepsis, Carbenepems had sensitivity of 46.6%. The most commonly isolated organism in both early onset sepsis and late onset sepsis was Enterobacter spp, that shows maximum sensitivity to Polymixin B and Carbenepems. Klebsella Pneumonae was second most common organism isolated. It shows maximum sensitivity to Polymixin B and Carbenepems.

**Discussion**

Neonatal sepsis remains a major cause of morbidity and mortality in the neonates. The clinical diagnosis of neonatal sepsis is difficult as it presents with non-specific signs and symptoms. An early diagnosis of neonatal septicemia is important to initiate appropriate and prompt treatment. The correct and timely identification of infectious agents and their antibiotic sensitivity patterns are essential to guide the clinicians regarding both the empirical and definitive treatment. The bacteriological profile of septicemia keeps changing with the passage of time from region to region and hospital to hospital, in the country. The emergence of resistant bacteria in NICU settings leads to failure in the treatment of neonatal sepsis. For management of sepsis in neonates, we need to do longitudinal survey of the NICUs and make periodic guidelines for empirical treatment. In recent years, there has been a lot of improvement in medical care and as a result, the survival rate of the preterm and LBW babies has shown improvement. But at the same time, these neonates with immature immune mechanisms are exposed to NICU flora for longer periods. Most of the neonatal sepsis cases are either LBW or preterm. In the present study, 88 (62.4%) were preterm neonates which has led to more LOS as compared to EOS. Mhada et al. reported 23% of preterm neonates, in their study. The difficult delivery (32%) in the form of Caesarean, forceps or vacuum was found as a risk factor (14.88%) by Tallur et al.6

Mostly as per literature, the common pathogens of early onset sepsis are E coli, group B streptococci, Listeria monocytogenes and enterococcus spp. In Contrast our study showed Enterobacter Spp. (43.3%) and klebsella pneumoniae (28.4%) as the most common Gram-negative organisms of early onset sepsis which is quite high as compared to studies conducted by Agnihotri et al. and Sundaram et al. In our study early onset sepsis and late onset sepsis organism profile was similar in both group as also reported by other recent study from India (DeNIS collaboration). It may be possible that the pregnant women in South Asia are colonized with pathogens found in the hospitals (such as enterobactor, Klebsiella), also it may be more probable that the source of infection in early onset sepsis is the unhygienic practices in the labour rooms and neonatal intensive care units.

**Conclusion**

Successful management of neonatal sepsis depends upon quick identification of the causative organism following the environmental and hospital trends and initiation of empirical therapy. Gram negative organisms particularly Enterobacter spp., Klebsella Pneumoniae and Acinetobacto Baumanii. are predominant organisms causing neonatal sepsis in our neonatal intensive care unit. The resistance pattern and bacteriological profile is similar in early as well as late onset sepsis. Gram positive organisms are not the common cause of sepsis in our centre. There is urgent need to control growing microbial resistance by judicious use of antibiotics and continued surveillance.
Conflict of Interest: We declare that we have no conflict of interest.

Source of Funding: None

Ethical Clearance: The study was cleared by the institutional ethical committee.

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In Vitro Evaluation of Shear Bond Strength of Orthodontic Brackets Cemented to Natural Teeth Treated with Various Soft Drinks

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ABSTRACT

Introduction: The common problem during the orthodontic treatment is debonding of brackets which leads to failure of orthodontic treatment. The purpose of this study was to determine the effects of four soft drinks (Coca-Cola, 7Up, Tropicana orange, minute maid apple juice) on the shear bond strength of orthodontic brackets.

Aim: To evaluate shear bond strength of orthodontic brackets cemented to natural teeth treated with various soft drinks

Materials and Method: A total of 50 extracted human premolars were collected and stored in normal saline solution. They were cleaned and cemented with edge wise stainless steel brackets using composite. Then they were cycled in the said four soft drinks for 2 hours up to 7 days. The samples were tested for their shear bond strength using Universal testing machine (INSTRON) with a cross head speed of 0.5mm/min. The values were tabulated and analyzed statistically using ANOVA.

Results: The lowest mean resistance to shearing forces was shown by control group (18.74 ± 5.15 Mpa) followed by 7Up group (20.17 ± 6.76 Mpa), orange juice group (21.79 ± 5.15 Mpa), Coca Cola group (24.58 ± 11.68 Mpa) and highest resistance to shearing forces by apple juice group (26.04 ± 1.31 Mpa). There was no statistically significant difference among the groups.

Conclusion: No significant differences were observed in bond strength of the teeth among the different groups suggesting that consumption of soft drinks after cementation of orthodontic brackets do not significantly affect in de-bonding the brackets.

Keywords: microleakage, shear bond strength, soft drinks

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Introduction

In developing countries, there is increasing trend of consumption of Soft drink, especially among young people.¹ This habit often continues into adulthood. Soft drinks contain high sugar content and a pH of < 5.5 which is below the critical level that will cause enamel demineralization leading to dental erosion and also microleakage beneath the orthodontic brackets in patients undergoing orthodontic treatment.³⁴ This is a matter of concern among dental practitioners.
Debonding of brackets during orthodontic treatment is commonly seen. Hence, patients receiving orthodontic care need proper attention.

The causative factor for bond failure is due to acidic foods and drinks with the low pH in the diet of the patient which increases treatment time. This might also have an erosive influence on the hydroxyapatite component of teeth. Coca-cola is categorized as the most carbonated drink (50%) which contains high levels of citric acid and phosphoric acid that should be seen as a true hazard for patients with orthodontic appliances. Very few studies have been conducted in the past to evaluate the effect of soft drinks on the bond strength. Coca-cola, 7-Up, Orange juice and Apple juice are widely available in the market and is very popular among adolescents undergoing orthodontic treatment. The purpose of this study was to determine the effects of these four soft drinks (Coca-cola, 7-Up, orange juice and apple juice on the shear bond strength of orthodontic brackets in vitro.

Materials and Methodology

This in vitro study was conducted at the department of conservative dentistry and prosthodontics, Melaka Manipal Medical College, Manipal. Ethical clearance was obtained from Institutional Ethical committee.

1. Sample Selection: The software G*Power 3.0.10 was used to estimate the required sample size for the study. A total of 50 extracted human premolars were collected and stored in normal saline solution. The teeth selected for the study were free from enamel cracks, caries, and fillings. These teeth were fixed in self-cure acrylic blocks using aluminum tubes (Figure 1). Fifty 0.022” stainless-steel edgewise orthodontic brackets (Centrino Standard MBT ®) with a base surface of 12.2 square mmm were used in this study. (Figure 2)

Figure 1: Extracted premolars mounted in aluminum rings using acrylic resin

Figure 2: Stainless steel Edgewise Orthodontic brackets

2. Bonding of brackets: All 50 teeth were cleaned and polished thoroughly using pumice slurry before the bonding procedure. The teeth were etched using 37% phosphoric acid gel (DETREY Conditioner 36, Dentsply, UK) for 30 seconds as per manufacturer’s instructions. The teeth were rinsed with water spray and air dried until a frosty white appearance was seen on the etched buccal surface.

A thin uniform layer of Spectrum® bond- Nano-Technology Dental Adhesive (DENTSPLY, UK) was applied using a brush on the buccal surfaces of each tooth and also onto the base of the orthodontic brackets following manufacturer’s instruction and the bonding agent was cured. A flat-ended composite filling instrument was used to apply the required amount of Spectrum® dental composite (DENTSPLY, UK) onto the buccal tooth surface as well as the base of orthodontic brackets.

The bracket was then pressed firmly into the center of the crown of the tooth mesiodistally and along the long axis of the tooth immediately (Figure 3). Excess (composite) was removed from the bracket using a sharp scaler.
The composite was light-cured using Densply LED light curing unit on all four sides of the bracket edge, 10 seconds per side at a distance of 1-2mm.

3. Immersion and Storage: The samples were then immersed in 5 different groups of beverages once daily for 2 hours. This process continued for seven days. Then they were washed with water and stored in distilled water at a temperature of 37 degree Celsius until the testing.

4. De-bonding testing: The samples were tested for their shear bond strength using the Universal testing machine (INSTRON) with a cross head speed of 0.5mm/min. The values were obtained in Newton. The values which were obtained in Newton were converted to Megapascals by dividing the total area with 12.2 square mm which is the area of the single bracket. (Figure 4)

Statistical Analysis: Anticipating an effect size of 0.6 and to test the null hypothesis at 5% level of significance with 80% power the required sample size was 40. It was increased to 50 (10 per group), anticipating 20% failure during testing. Mean of the debond testing was compared applying Welch Anova followed by Post Hoc Games-Howell test using software SPSS version 15. P<0.05 was considered statistically significant.

Table 1: Beverages were divided into five groups in this study

<table>
<thead>
<tr>
<th>Groups</th>
<th>Beverages Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Control – Distilled water</td>
</tr>
<tr>
<td>Group 2</td>
<td>Tropicana Orange Juice (PepsiCo.)</td>
</tr>
<tr>
<td>Group 3</td>
<td>7 – UP (PepsiCo India)</td>
</tr>
<tr>
<td>Group 4</td>
<td>Tropicana Apple Juice (PepsiCo.)</td>
</tr>
<tr>
<td>Group 5</td>
<td>Coca-Cola (Coca-Cola India Pvt. Limited)</td>
</tr>
</tbody>
</table>

Table 2: Mean resistance to shearing forces

<table>
<thead>
<tr>
<th>Soft Drinks</th>
<th>n</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Welch Anova F (4,11.37)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Juice</td>
<td>7</td>
<td>18.74</td>
<td>5.15</td>
<td>3.61</td>
<td>0.038</td>
</tr>
<tr>
<td>Orange Juice</td>
<td>7</td>
<td>21.79</td>
<td>5.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Up</td>
<td>7</td>
<td>20.17</td>
<td>6.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distilled Water</td>
<td>7</td>
<td>26.04</td>
<td>1.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COCA COLA</td>
<td>7</td>
<td>24.58</td>
<td>11.68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results

Table 2 shows the group wise summary (mean and SD) and result of group mean comparison. Considering unequal variance (Levene test of homogeneity of variance (P<0.001)) group means were compared applying Welch Anova (Robust test of equality of means). Welch Anova indicated significant difference in the group means (F (4,11.37)=3.61, P=0.038). Post Hoc Games-Howell test for pair-wise comparison did not show any significant difference in the group means. Mean resistance was maximum for Distilled water (mean=26.04) and was least for Apple juice (mean=18.74). The difference in mean of these two groups were not significant (P=0.08).

Among the selected values, the lowest mean resistance to shearing forces was shown by apple juice group (18.74 ± 5.15 Mpa) followed by 7Up group (20.17 ± 6.76 Mpa), orange juice group (21.79 ± 5.15 Mpa), Coca-Cola group (24.58 ± 11.68 Mpa) and highest resistance to shearing forces by control group (26.04 ± 1.31 Mpa).

A considerable amount of intergroup variation was seen in the coca-cola group. All the other groups showed lesser inter group variation.

Discussion

Several studies have reported that consumption of acidic beverages like cold drinks leads to debonding of orthodontic brackets due to decrease retention.1-6
This is an in vitro study, designed to reproduce in vivo situation. In the experiment, different drinks that are commonly consumed by target groups which are Coca-Cola, 7Up, Orange Juice, Apple Juice, and also distilled water (control) are used as manipulative variables.

The immersion times and schedules used in the many past studies varied widely. In our study, 50 specimens divided equally were kept for 2 hours, in respective drink groups daily for seven days. The remaining time it was kept in distilled water to mimic the normal oral environment. In this way, we can assume that these drinks were consumed 3 – 4 times a day considering 45 minutes to consume one drink.5

Coca-Cola was the most acidic drink followed by 7 UP. The apple and orange juices were also acidic. Both Coca-Cola and 7 UP contains citric acid which gives the acidity to the drink. The apple and orange juices contain calcium citrate and ascorbic acid. All these soft drinks have demineralizing effects on teeth surface.

The cementing of brackets under one operator minimizes the error and standardize the cementing force. During debond testing using Instron machine with a shear head speed of 0.5 mm/min,

Also, it is noteworthy to note that the inter group variations obtained in Coca-Cola group were higher compared to the other groups.

The results obtained are similar to the results of Navaro’s et al 5 study who reported that bond strength values for teeth treated in Coca-Cola and Schweppes Limon were not significantly different from those in their control group. Also, our results were in consistent with a study done by Suparssara et al10

This result contradicts with some of the studies conducted1,12 that found Coca-Cola showing a reduction in shear bond strength of orthodontic brackets. Based on the study, the teeth were immersed in Coca-Cola thrice a day, while our study only immersed the teeth once daily in respective drink groups. Hence, the study might have a better imitation of soft drink consumption by target groups. Coca-Cola is an acidic media, and it can decalcify tooth (Borjan a Ferrari). Calcium may leach out from the teeth, thus soften and erodes the dental hard tissues. This will then facilitates abrasion. Furthermore, the structure of bisphenol A glycidyl methacrylate-based composite resins which is the main composition of the adhesive used in the study will be degraded with acid and acidic drink consumption as mentioned as suprssra et al.12 The matrix of the adhesive will soften which leads to filler leaching out, thus lowering the bond strength of the brackets (Hobson RS).

The limitation of this study was an unexpected increase in the failure rate of teeth (lesser sample size) could be one of the reason for insignificant difference in the group means. Hence further study may be required by increasing the sample size.

There are many factors that may affect the results. For example, the experiment done is an in vitro study, which the teeth used are extracted from different patients, at different times, of different age. Hence, the mineralization level of each tooth differs as it is affected by their lifestyles, oral hygiene and age factor. Also, the biggest disadvantage in these studies is that the data of beverages consumed by the individual before the bonding is often unknown, which could be a major factor while comparing the results.

Furthermore, the teeth used are premolars, which have a convex surface. The bonding position of the brackets is not always consistent between different teeth. Thereby, affecting the force applied during debonding process might vary. Therefore studies are required.

**Conclusion**

No significant differences were observed in bond strength of the teeth after debonding among the different groups suggesting that consumption of soft drinks after cementation of orthodontic brackets do not significantly affect debonding of orthodontic brackets.

**Conflict of Interests:** The authors declare no conflict of interests.

**Ethics Approval:** Obtained from Institutional Ethical Committee.

**Source of Funding:** None.

**Authors’ Contributions:** All authors contributed to the work.

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An Improved Active Contour Method for Medical Image Segmentation using Singular Value Decomposition

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ABSTRACT

An image segmentation method uses dynamic shape models (ACM) executed by methods for level set systems have been successfully used as piece of picture division. essential idea of ACM is to undeniably address shapes zero level game plan of higher dimensional level set limit, & figure progression of frame through improvement of level set.since they always produce sub-regions with continuous boundaries. However, traditional edge-based active contour models have been applicable to only relatively simple images whose sub-regions are uniform without internal edges. A partial solution to the problem of internal edges is to partition an image based on the statistical approach i.e. Information of image intensity measured and active contour model based on level set and Singular Value Decomposition may be applied to improve the efficiency and accuracy in poor quality images. In this paper an Improved Active Contour Method for medical image segmentation is based on active appearance models, active shape models, level set,PCA and Linear Discriminant Analysis are analyzed with intent to produce an inhomogeneous environment using SVD for segmentation of real world images in the presence of intensity in-homogeneity and noise.

Keywords: Medical Image Segmentation, Level Set, Active Contour, Singular Value Decomposition, Linear Discriminant Analysis, Intensity homogeneity, Noise etc.

Introduction

Image Segmentation: Image segmentation is the problem of partitioning an image in a semantically meaningful way. This vague definition implies the generality of the problem - segmentation can be found in any image-driven process, e.g. fingerprint/text/ face recognition, detection of anomalies in industrial pipelines, tracking of moving people/cars/airplanes, etc. For many applications, segmentation reduces to finding an object in an image. This involves partitioning the image into two classes of regions - either object or background. Segmentation is taking place naturally in the human visual system. Human kinds are experts in detecting patterns, lines, edges and shapes, and making decisions based upon the visual information. At the same time, we are overwhelmed by the amount of image information that can be captured by today’s technology. It is simply not feasible in practice to manually process all the images (or it would be very expensive and tiresome. Instead, we design algorithms\textsuperscript{[1]} which look for certain patterns and objects of interest and put them to our attention. For example, a recent popular application is to search and match known faces in your photo library which makes it possible to automatically generate photo collections with a certain person. An important part of this application is to segment the image into “face” and “background”. This can be done in a number of ways, and it is well accepted that no general purpose segmentation algorithm exists, or that it ever will be invented. Thus, when designing a segmentation algorithm, the application is always of primary focus: based on edges, lines, shapes, colors etc.

Active Shape Models: Dynamic shape appearance (ASM) \textsuperscript{[6]}, is champion among most standard show based strategies for remedial picture division. It can be considered as advancement of deformable models while converging earlier shape data. shape earlier is worked by Point Distribution Model (PDM) which models shape varieties from arranging set. In PDM, shape is tended to by approach of spotlights appropriated on limit.
Numerically, it can be portrayed by \( n \times d \) dimensional vector interfacing each point’s headings, where \( n \) is measure of focuses & \( d \) is estimation of point organizes. For instance, 2D state of \( n \) focuses is depicted as:

\[
X = (x_1, y_1, x_2, y_2, \ldots, x_n, y_n)^T \tag{1}
\]

Given training set, each shape is represented by \( n \) points referring to same coordinate system (order) throughout entire training set. Then, these shapes have to be aligned into same coordinates system to filter out shape variations caused by translation, rotation & scaling. This procedure is commonly accomplished using Generalized Procrustes Analysis\(^6\), which minimizes least squared error between points. Once correspondences have been established, Principal Component Analysis (PCA) is used to build statistical shape model. mean shape of training set of \( N \) samples is calculated using:

\[
\overline{X} = \frac{1}{N} \sum_{i=1}^{N} X_i \tag{2}
\]

A covariance matrix \( S \) is computed by:

\[
S = \frac{1}{N} \sum_{i=1}^{N} (X_i - \overline{X})(X_i - \overline{X})^T \tag{3}
\]

An eigen decomposition of \( S \) yields eigenvectors \( \{P_i\}_{i=1}^{nd} \) (representing principle modes of variation) & corresponding eigenvalues \( \{\lambda_i\}_{i=1}^{nd} \) (indicating their importance in construction of model). Sorting all modes from largest to smallest variance, first \( k \) modes are employed to model observed variability of training set. Then, shape instances of this population can be expressed by linear combination of \( k \) significant modes of variation.

\[
\overline{X} = X + P_b \tag{4}
\]

where \( P = (P_1, P_2, P_3, \ldots, P_p) \) is matrix of first \( k \) eigenvectors, & \( b = (b_1, b_2, b_3, \ldots, b_k)^T \) is vector of weights, refereed to as shape parameters. We note that number \( k \) is significantly smaller than number of dimension \( n_d \). Varying parameters \( b \) can generate new examples of shape. interval values of \( b \) are imposed to constrain resulting new shape to be valid. Now given image, instance \( y \) of model in image is defined by similarity transform \( T \) & shape parameter vector \( b \).

\[
y = T(X + P_b) \tag{5}
\]

In order to find both transform \( T \) (also called as pose parameters) & shape parameters \( b \), iterative method is used given initial model state. At each iteration, current model state \( y \) is known in image space. First, optimal displacement of each model point is calculated according to image observations. This leads to vector of suggested movement of model dy in image space. Second, pose \( T \) is adjusted by Procrustes match of model to \( y + dy \) leading to new transformation \( T \) & new residual displacements \( dys \). Next, \( dys \) is transformed into model space & then projected into parameter space to give optimal parameter updates:

\[
db = P\hat{T}^{-1} \tag{6}
\]

where \( \hat{T} \) is equal to \( T \) but without translation part. In wake of reviving \( b \), another model case is made & used to invigorate state of model in photo. Thusly, just distortions that resemble shapes in readiness set are allowed. This technique is reiterated until movements of stance & shape parameters wind up observably irrelevant.

Remembering true objective to upgrade photo appearance, varieties of ASM use different features going past clear reasoning on constrain.\(^9\) uses Gabor wavelets & models part apportionment by Gaussian mix models.\(^10\) uses steerable features to address inquiry appearance. Beside Gaussian mix models, other nonlinear models are in like manner used for showing appearance course.\(^4\) proposes non-parametric appearance show which is set up on both honest to goodness & counterfeit instances of cutoff profiles & probability of given picture profile being bit of point of confinement is obtained using \( k \) nearest neighbor (kNN) probability thickness estimation.

Correspondingly,\(^6\) uses non-guide kNN classifier\(^2\) to evaluate if truth is inside or outside of dissent.\(^3\) use Adaboost estimation to fabricate appearance models.

Parallel to component space, attempts have been made on ASM look designs.\(^6\) merges PDM with biggest likelihood shape acceptance, where perfect course of action can be found using particle isolating in iterated likelihood estimating plan. usage of innumerable makes division by shape atom filtering energetic to close-by maxima & free of prologue to burden of growing computational cost.\(^7\) is extension work of dividing multi-objects using atom channels. Another heading of improving chase plot is to intertwine MRF regularization.\(^4\) joins regularization constraint rebuffing oddity
plans that is restricted using dynamic programming figuring.\(^9\) proposes procedure that unites MRF-based neighborhood shape show for guided candidate decision with PCA-based overall shape exhibit for regularization.

Given another photo, shape estimation incorporates trading design: beginning MRF deduction technique picks best contender for each point, by then they are used to revive parameters of overall stance & shape illustrate.

Related Work

**Linear Discriminant Analysis (LDA):** Straight Discriminant Analysis has been enough utilized as social event technique for various issues including face assertion. While PCA takes entire arranging information as one substance’s, will probably perceive intense method to address face vector space by mishandling class data. ace needs to perceive quick change from vital picture space to diminished estimation consolidate space. PCA gives initiate vectors which best address information perceptions by extending refinement of predicted information. Notwithstanding, these initiate vectors give no optimality to segregation among unmistakable classes. Fisher’s straight discriminant examination (LDA)\(^3,4,5,6\) portrays best direct subspace as course of action of present vectors which best seclude among classes once information is normal onto subspace.

In particular, objective has been to see strategy of initiate vectors which control refinement of predicted information inside each class while broadening change among different classes. PCA point of view does not give any data to class separation yet rather estimation lessen. Actually, PCA paradigm\(^8\) does not provide any information for class discrimination but dimension reduction. Accordingly, FLD has been applied to projection of set of training samples in eigen space \(X = (X_1, X_2, X_3, \ldots, X_n) \subseteq \mathbb{R}^{r \times n}\). paradigm finds optimal subspace for classification in which ratio of between-class scatter & within-class scatter is maximized. Let between class scatter matrix be defined as \(^3\).

\[
S_B = \sum_{i=1}^{C} n_i (\bar{X}_i - \bar{X})(\bar{X}_i - \bar{X})^T \quad \ldots(1)
\]

and with in-class scatter matrix be defined as

\[
S_W = \sum_{i=1}^{C} \sum_{x_i \in C} n_t (x_i - \bar{X})(x_i - \bar{X})^T \quad \ldots(2)
\]

Where \(X = (1/n) \sum_{j=1}^{n_C} X_j\) is mean image of ensemble, 
& \(\bar{X} = (1/n) \sum_{j=1}^{n_C} X_j^t\) is mean image of ith class & \(c\) is number of classes. optimal subspace \(E_{\text{optimal}}\) by FLD is determined as follows

\[
E_{\text{optimal}} = \arg \max_i \left[ \frac{E^T S_B E}{E^T S_W E} \right] = [e_1^T, e_2^T, \ldots, e_{c-1}] \quad \ldots(3)
\]

where \(e_1, e_2, e_3, \ldots, e_{c-1}\) is set of generalized eigenvectors of \(S_B\) and \(S_W\) corresponding to largest generalized eigen values \(\lambda_1, 2, 3, \ldots, c\) i.e.

\[
S_B E_i = \lambda_i S_W E_i \quad \ldots(4)
\]

Thus feature vectors \(P\) for any query face image \(Z\) in most discriminant sense can be calculated as follows:

\[
P = E_{\text{optimal}}^T U^T Z \quad \ldots(5)
\]

Figure 1: Segmentation using PCA & LDA
As opposed to properties of eigen features which are not unfaltering too there are most extraordinary chances of data disaster with low pixel regards & subsequently gathering precision with LDA can’t be ordinary.

The other technique for using PCA is with higher dimensional regards called Specific Values which are enduring by its inclination. Thus instead of using EVD [10] to update course of action precision of feature request & division SVD can be used.

Specific Value Decomposition: The specific regard deterioration is after effect of straight factor based math. It has entrancing & vital influence in various applications. On such application is in cutting edge picture planning. SVD in electronic applications gives intense technique for securing huge pictures as smaller, more sensible square ones. This is capable by imitating principal picture with each succeeding nonzero singular regard. In addition, to decrease limit measure considerably further, pictures may be approximated using less specific regards.

Singular regard crumbling of structure of m x n organize shape has been as given hereunder,

\[ A = U\Sigma V^T \]  
\[ \text{Where } U \text{ is m x m orthogonal matrix; } V \text{ n x n orthogonal matrix, & } \Sigma \text{ is m x n matrix containing singular values of } \sigma_1 \geq \sigma_2 \geq \ldots \geq \sigma_m \geq 0 \text{ along its main diagonal.} \]

A similar technique, known as eigenvalue decomposition [11] (EVD), is diagonal to matrix A, but with this case, must be square matrix. EVD diagonal [12] to as

\[ A = VDV^{-1} \]  
\[ \text{Where } D \text{ is diagonal matrix } \sigma_i \text{ comprised of eigenvalues, & } V \text{ is matrix columns of which comprise corresponding eigenvectors. Where Eigen value decomposition may not be possible for all facial images where SVD is result.} \]

Proposed Algorithm in Inhomogeneous Environment using SVD.

1. Input Image
2. Preprocess Image (de-noise Image)
3. Find mean of obtained value de-noised dataset ‘S’.
4. Subtract mean value from S. From these values new matrix ‘A’ is obtained.
5. Compute covariance ‘C’ from ‘A’ using

\[ C = AA^T \text{ Where, if data } 1,\ldots,l \in R^n \text{ \& division SVD covariance matrix will be: } c = \frac{1}{l} \sum_{i=1}^{l} A_i A_i^T \]

6. eigenvalues (Singular Values) are obtained from covariance matrixes, where are \[ [V_1, V_2, \ldots, V_n] \]
7. Finally, eigenvectors which uses singular features are calculated for covariance matrix C.

8. Any vector S or S − S can be written as linear combination of eigenvectors as:

a. \[ S = b_1u_1 + b_2u_2 + b_3u_3 + \ldots = b_r u_r \]

b. lower dimensional dataset is obtained from largest eigenvalues only are kept to form \[ S = \sum_{i=1}^{l} b_i u_i, l < N \]

c. Apply LDA for further feature Processing to obtain distinct features.

\[ S_b = \sum_{i=1}^{c} n_i (\bar{X}_i - \bar{X})(\bar{X}_i - \bar{X})^T \]

\[ S_w = \sum_{i=1}^{c} n_i (\bar{X}_i - \bar{X})(\bar{X}_i - \bar{X})^T \]

\[ E_{\text{optimal}} = \arg \max_{E} \frac{E^T S_b E}{E^T S_w E} = [e_1, e_2, \ldots, e_c] \]

\[ p = E_{\text{optimal}} U^T \]

9. Project obtained features in image space & cluster features & reconstruct image I

/* Apply variational Level Set method for segmentation*/

10. Let I be image, & g be edge indicator function defined by,

\[ g = \frac{1}{1 + ||\nabla G_{\sigma} * I||} \]

Then find coefficient of internal energy term that help contour to outside object boundary.

11. contour (or level set) C(t) is curve described by set of points where function has similar features. zero level set can be given as
\[ C(t) = \{(x, y) \in \Omega : \phi(x, y, t) = 0\} \]

where \( t \) is variable that indicates time step in evolution of contour.

inside \( (C) = \Omega_1 = \{(x, y) \in \Omega : \phi(x, y, t) < 0\} \) &
inside \( (C) = \Omega_2 = \{(x, y) \in \Omega : \phi(x, y, t) > 0\} \)

10. Classify Features according properties also known as segmentation.

Consider the following figure Proposed Algorithm in Inhomogeneous Environment using SVD

Fig. 2: Segmentation using PCA & SVD

Discussions

In this paper proposed changed dynamic frame strategy in perspective of authentic approach for picture division is associated & attempted with three remarkable enlightening accumulations of helpful pictures made available by bit of epic researchers as benchmark datasets for examination updates. In midst of whole examination of updated methodology.

Conventional systems like locale based dynamic shape models i.e. Dynamic Shape or Active Appearance models are used as benchmarking techniques & some preprocessing frameworks are also used for change of nature of picture & picture condition in which it is gotten. This hybridized improved system is evaluated based inside datasets with their verifiable properties. Review & examination of part of past procedures found be unsupervised one while this proposed method chooses quantifiable information from readiness tests. In next segment separated examination of past conventional systems & changed methods are analyzed. past methods are normal as benchmarking technique.

Ethical Clearence: Not Required

Source of Funding: Self

Conflict of Interest: Nil

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Approach- State Of The Art and Analysis


Effect of Ice Pack Application on Pain During Venipuncture among the Children Admitted in Selected Pediatric Units of Sangli, Miraj, Kupwad Corporation Area

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ABSTRACT

“A study to assess effect of ice pack application on pain during venipuncture among the children admitted in selected pediatric units of Sangli, Miraj, Kupwad corporation area”. Background: Pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Intrusive procedures such as venipuncture are really a stressful event for children. Venipuncture in the paediatric population can be the most distressing event associated with medical encounters. A nurse has to help the children through such procedure. The nurse caring the child during procedure has a double task. One is helping the child and parents effectively and the other is ensuring the effectiveness of procedures. Objectives: 1.To assess the level of pain during venipuncture in control group. 2. To assess the effect of Icepack application on pain during venipuncture in experimental group. Methodology- Research design selected for the present study was quasi experimental- post test only control group design to assess the effect of ice pack application on pain during venipuncture among the children. The sample comprised of 50 children in experimental and 50 children in control group. Sample was selected using Non probability purposive sampling technique. The pain during venipuncture was assessed using FLACC pain scale. Data was analyzed using descriptive and inferential statistics. Result: The mean pain score of control group was 7.96 and mean score of experimental group was 5.4 with a P value of 0.000 which was significantly high. This shows that severe pain is less in experimental group compared to control group. Conclusion: The results of this study proved that the use of ice pack application prior to venipuncture is effective intervention for reducing venipuncture-related pain. It was concluded from the statistical tests that practicing ice pack application prior to venipuncture was effective in reduction of pain during venipuncture in children. Ice pack application has a significant effect on pain during venipuncture.

Keywords: Effect, Ice pack Application, pain during venipuncture.

Introduction

Pain is a universal, complex and subjective experience. Children experiences more distress during hospitalisation. Painful medical procedures are the major sources of distress among children; and for those with acute and chronic diseases, the procedure-related pain can be worse than that of the illness itself. Illness and hospitalization expose children to unfamiliar and unpleasant feelings.¹

Since children have little experience with and comprehension of the pain and disease process, such negative feeling can cause intimidation and anxiety for them. Millions of children experience these procedures which cause considerable distress.²

Children requiring needle stick such as injections, IV catheters and blood sampling view these procedure as frightening and is a significant source of pain. Non-pharmacological procedures or technique to reduce procedure related pain can be performed independently.

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by a nurse. A number of non-pharmacological techniques such as distraction, relaxation, guided imagery and cutaneous stimulation provides coping strategies that may help to reduce pain perception, make pain more tolerable, decrease anxiety and enhance the effectiveness of analgesics.

One of these measures is proper use of cutaneous stimulation which can reduce pain perception. Cutaneous stimulation is performed by several methods such as simple rhythmic rubbing, use of pressure or electric vibrator, application of cold and hot at site before injection, which has been significantly valued in various sites. Cold application relieves pain by slowing the ability of pain fibres to transmit pain impulse.

**Materials and Method**

A quantitative research approach was adopted to conduct this study. Quasi experimental research design was used. The study was carried out at Sangli, Miraj and Kupwad Corporation area. Data collection was done using standardized FLACC pain assessment scale. The sample comprised of 50 children in experimental and 50 children in control group. Non probability purposive sampling technique was used for sample selection.

**Criteria for Sample Selection:**

**Inclusion Criteria:**
- Child with age group of 1 - 6 years.
- A child admitted to paediatric unit and requiring venipuncture procedure.

**Exclusion Criteria:**
- A Child who was on ventilator
- A child with skin allergies/burn at the venipuncture site
- A child who was on sedation during venipuncture.

**Procedure for data collection:** The data was collected in three phases.

**Pre intervention phase:** Phase I: Demographic data was collected from parents of samples in the experimental and control group.

**Intervention phase:** Phase II: In experimental group, ice-application was done for 3 minutes prior to venipuncture at venipuncture site. In control group, hospital protocol was carried out for venipuncture procedure.

**Post intervention phase:** Phase III: The level of pain was assessed with the help of FLACC scale in both experimental and control group during venipuncture.

**Hypothesis:** H$_0$: There is no significant effect of ice pack application on pain during venipuncture among children admitted in paediatric units.

**Results and Discussion**

In this study maximum children were in age group of 4 to 6 years in both the group that is 40% in control group and 44% in experimental group. Gender wise 66% were male in control group and 64% were male in the experimental group.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
</tr>
<tr>
<td>Face</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasional Grimace (1)</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Clenched Jaw (2)</td>
<td>37</td>
<td>74</td>
</tr>
<tr>
<td>Leg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uneasy, restless, tensed (1)</td>
<td>31</td>
<td>62</td>
</tr>
<tr>
<td>Kicking, legs drawn up (2)</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squirming, shifting, tense (1)</td>
<td>49</td>
<td>98</td>
</tr>
<tr>
<td>Arched, rigid or jerking (1)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No cry (0)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Moans, occasional compliant (1)</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Crying steadily, frequent complaints (2)</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td>Consolability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reassured by occasional touching, distractible (1)</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Difficult to console or comfort(2)</td>
<td>41</td>
<td>82</td>
</tr>
</tbody>
</table>
Above table shows that in the criteria of face and legs compared to control group, experimental group had low pain score. 44% had clenched jaw in experimental group than 74% in control group. 2% had score legs drawn up in experimental group, compared to 38% in control group. There was not much difference in both the groups in activity, because it had almost similar frequency. 36% children not cried in experimental group during venipuncture. In Consolability 82% children were difficult to consol in control group and experimental group it was only 8%.

The grading of pain was categorised into three that is mild (1 - 3 score), moderate (4 - 7) and severe (8 - 10 score). Not a single child was in mild pain category in both the groups. 74% children were in severe pain where as only 6% children had severe pain in experimental group. This shows that severe pain intensity was very less in experimental group compared to control group.

**Comparison of pain in control and experimental group:** Table number 2 shows that in comparison of pain there were highly significant differences in Face, Legs, Cry, and Consolability except Activity. Total mean of control group was 7.96 and mean of experimental group was 5.4 with t value 15.849 and a \( P \) value of \( 0.000 \) which is significantly high because it was less than 0.05.

This shows that severe pain is less in experimental group compared to control group. According to the tested values Null hypothesis was rejected. That means there is significant change in level of pain after application of ice pack in experimental group.

### Table 2: Comparison of pain in control and experimental group

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Control group</th>
<th>Experimental group</th>
<th>t value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>SD</td>
<td>mean</td>
<td>SD</td>
</tr>
<tr>
<td>Face</td>
<td>1.74</td>
<td>0.443</td>
<td>1.44</td>
<td>0.501</td>
</tr>
<tr>
<td>Legs</td>
<td>1.38</td>
<td>0.49</td>
<td>1.02</td>
<td>0.141</td>
</tr>
<tr>
<td>Activity</td>
<td>1.02</td>
<td>0.141</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cry</td>
<td>2</td>
<td>0</td>
<td>0.86</td>
<td>0.756</td>
</tr>
<tr>
<td>Consolability</td>
<td>1.82</td>
<td>0.388</td>
<td>1.08</td>
<td>0.274</td>
</tr>
<tr>
<td>Total</td>
<td>7.96</td>
<td>0.699</td>
<td>5.4</td>
<td>0.904</td>
</tr>
</tbody>
</table>

**Discussion**

The effect of icepack on pain suggests that it may act like sensory stimuli on pain gate mechanism. Since cold stimuli are quite intense they may lead to the release of endorphins and encephalin by the same mechanism. The fact that cold will effectively relieve pain, at least temporarily, has been supported by many studies. Following this principle in present study, the researcher decided to select children between the age group of 1 to 6 years. This age group accounts for maximum % of hospitalisation. In one of the study conducted on hospital admission patterns among the children showed that 36% children admitted among the age group 1 to 5 years. Also in the UNICEF systematic review on common childhood infections and gender inequalities it is reported that children below 6 years had maximum admissions for pneumonia, diarrhoea and malaria.\(^5\)

In this study maximum children were in the age group of 4 to 6 years in the both group that is 40% in control group and in experimental group 44%. According gender 66% were male in control group and 64% male in experimental group. 34% Females in control group and 36% female were in experimental group.\(^6\) In this study pain was assessed using FLACC scale. FLACC score was low in experimental group than the control group.

Result from the study showed that in control group 74% children were in severe pain whereas only 6% children had severe pain in experimental group. This shows that severe pain is less in experimental group compared to control group. Several studies support that the application of cold is effective in reducing pain associated with puncture. Also in the study which was done on pain during arterial puncture by Bastam M in (2015) showed that icepack was effective in reducing the pain associated even with arterial puncture. This experimental study was undertaken among patient admitted to emergency ward in a public educational centre, Iran. The mean and slandered deviations of
pain score immediately after the arterial puncture for treatment and control groups were 3.12 (1.68) and 4.6 (1.56), respectively. (p<0.001) This difference was statistically significant.7

A similar kind of study was conducted to assess the effectiveness of local cold application on pain response during intravenous procedure among children in selected hospital at Mangalore. (2010) In quasi experimental study they were taken 60 samples and used DAN scale was 3.52 for the experimental group and it was 6.78 for the control group, indicating a significant lower pain score for experimental group (p=0.001).8

In present study total mean of control group was 7.96 and mean of experimental group was 5.4 with t value 15.849 and a P value of 0.000 which is significantly high because it was less than 0.05. This shows that severe pain is less in experimental group compared to control group. According to the tested values Null hypothesis is rejected. Means there is significant change in level of pain after application of ice pack in experimental group. In comparison of pain there were highly significant differences in Face, Legs, Cry, and Consolability except Activity.

The above findings were supported by Navjot kiran et al(2013) who conducted study on effect of icepack application at the prior to venipuncture on intensity of pain among children in Chandigarh. Total 100 sample was assessed by using FLACC scale. In experimental group the mean pain score was 2.98 and in control group mean pain score was 4.7. The result had shown that, there was significant lesser mean pain score during venipuncture in experimental as compared to control group.9

Conclusion

In the present study effect of icepack application on intensity of pain was assessed. In the experimental group icepack was applied at the site of prior to venipuncture for three minutes and pain was assessed using FLACC pain scale. Finding of the study clearly indicate that intensity of pain was significantly lesser in experimental group than control group. Hence null hypothesis was rejected at 0.05 level of significance. Ice pack application helps in reducing pain during venipuncture among children admitted in paediatric units.

Recommendations

1. Comparative studies can be done for testing both pharmacological and non pharmacological measures.
2. More studies may be conducted with large sample to make generalisation.
3. Studies can be done by taking other age group like 7 years onwards.
4. Studies can be conducted on effect of icepack application on pain by using different pain scales.
5. A comparative study can be conducted to assess the effect of icepack application verses cutaneous stimulation by tapping.
6. A similar study can be conducted for IM injections.
7. A study can be done to assess the effect of distraction or diversion as a technique for pain control during venipuncture.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Considerations: The Research was approved by the Ethical committee after presenting proposal with data collection tool. It was promised that there would be no discomfort and risk to the participants. The time duration of the participation was ½ an hour to 1 hour. The name of the participant and data was kept confidential. The Participation was voluntary. Permission from concerned authority was taken before final study.

REFERENCES


Comparison of Conventional and Lateral Approach to Supraclavicular Brachial Block

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ABSTRACT

Background: The conventional approach is many a time associated with complications such as vascular puncture, inadequate analgesia etc. The lateral approach is hypothesized to be equipotent and much safer than the conventional approach. We aim to evaluate this hypothesis.

Method: After Institutional ethics committee clearance, the patients, after consenting, through computer generated block randomization, were allocated to either of the two groups – Group L or C. After the block, the duration for onset of sensory and motor blockade, the total duration of sensory & motor blockade and any complications were noted.

A total of 60 patients were analyzed, 30 patients for the lateral approach and 30 patients for conventional approach. ASA 1 and 2 patients who were undergoing the surgeries of the upper limb were included in the study.

Results: The incidence of complications was much higher in conventional approach as compared to the lateral approach with a p value of 0.041. In conventional approach, in 2 (6.7%) of the patients the block failed to act completely, inadequate block was seen in 7 (23.3%) of the patients of which vascular puncture was seen in 4 (13.3%) patients. In lateral approach, inadequate blockade was seen in 1 (3.3%) patient but there was no vascular puncture.

Conclusion: Lateral approach is a much safer and reliable technique of supraclavicular brachial block.

Keywords: Anesthesia conduction, Nerve Block, Brachial Plexus, Bupivacaine, Analgesia

Introduction

The supraclavicular brachial block is used to block the brachial plexus. It is one of the most commonly performed blocks all over the world. It can be used to anesthetize a patient for surgeries from the mid-arm down. It rightly has been called the “Spinal of the Upper Limb”. It helps avoid the administration of general anesthesia and, hence, the plethora of problems associated with it. It provides faster recovery and lesser in-hospital days.

The advent of ultrasound and nerve stimulators further improved the efficacy and the safety profile of the block [¹,²]. However, numerous places in our country are yet to be equipped with this technology and, hence, rely on the classical anatomical approach which utilizes paresthesia to locate the brachial plexus [³]. Though effective, the classical approach is laden with an increased frequency of complications such as vascular puncture, inadequate blockade or even a complete failure to act. In our study, we aim to evaluate the lateral approach as an alternate safer approach to administer the supraclavicular brachial plexus block [⁴,⁵].

Material and Method

After the approval of the institutional scientific and ethics committee, Patients aged between 18-65 years
of ASA 1 & 2 status posted for any elective surgery of the upper limb below the mid-arm such as A-V fistula, orthopedic surgeries and emergency cases with no known co-morbidities were included. Patient refusal, hypersensitivity to local anesthetics and adjuvants, heart block, dysrhythmia, uncontrolled hypertension, or any other severe systemic disease, ASA 3 and 4 patients with coagulation disorders, psychiatric illness that would interfere with perception of and assessment of pain, pregnancy and emergency cases with any co-morbidities were excluded from the study.

Using computer generated block randomization, the patients were distributed into two groups- 30 patients in each group

Group L: Brachial block was given by the lateral approach

Group C: Brachial block was given by the conventional approach

Each patient underwent a thorough pre-anesthetic evaluation including patient’s history, complete physical examination and appropriate investigations were done. The patients were explained about the nature, scope, procedures of the study and the risks involved and then a written informed consent was taken. The patients were educated about the VAS score (Visual analog scale) for assessment of intra operative and postoperative pain [6].

<table>
<thead>
<tr>
<th>VAS Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No pain, comfortable</td>
</tr>
<tr>
<td>1-3</td>
<td>Mild pain, discomfort</td>
</tr>
<tr>
<td>4-6</td>
<td>Moderate pain, bearable</td>
</tr>
<tr>
<td>7-9</td>
<td>Severe pain, unbearable</td>
</tr>
<tr>
<td>10</td>
<td>Most severe pain, unbearable</td>
</tr>
</tbody>
</table>

The patients were kept on nil per oral from 6 hours before surgery. No premedication was given before surgery. An 18G cannula was secured in the opposite arm and a crystalloid was started – Ringer’s Lactate for non-diabetic patients and normal saline for diabetics.

Once the patient was shifted into the OR, The baseline blood pressure, heart rate, saturation and ECG were noted.

In both lateral and conventional approach paraesthesia in the arm, forearm or hand were sought for. Once the nerve plexus was identified, an assistant administered a mixture of 2% lignocaine with adrenaline (1:200000) 7 mg/kg and 0.5% Bupivacaine 2 mg/kg. After administering the block, a gentle pressure was given at the area of the block to help uniform spread of the drug.

During the procedure and after, the signs for complications are vigilantly looked for such as pleural puncture, vascular puncture, hematoma formation, Horner’s syndrome, phrenic nerve palsy, local anesthetic toxicity and post-operative nausea and vomiting etc [7].

The time for onset of sensory and motor block was measured and the quality of analgesia was assessed using VAS scores. Intra-op blood pressure, pulse rate and SpO2 are measured.

A successful sensory block was defined as the subjective feeling of loss of pain, heaviness, tingling and numbness. The motor block was defined as the paresis of the upper arm in the form of inability to lift or abduct the forearm.

After completion of surgery, patients were shifted to the recovery room. All analgesics and sedatives were withheld in the postoperative period, unless the patient complained of pain. Postop analgesia was recorded for 24 hours. When patients complained of pain (>3 VAS), parenteral analgesic (Inj.Diclofenac Sodium 50 mg in 100ml infusion over 10 min) was given.

SAMPLE SIZE was calculated using the following formula

\[
N = \frac{Z_{\alpha}^2 \times \sigma^2}{d^2}
\]

Where, \(Z_{\alpha} = 1.96\) at 95% confidence interval
\[
\sigma = \text{Standard Deviation}
\]
\[
d = 15\% \text{ of mean difference}
\]

The sample size of 60 patients has been arrived at with 85% of power and 95% confidence level, 30 patients for the lateral approach and 30 patients for conventional approach.

**Statistical Analysis:** Data was analyzed by student’s unpaired ’t’ test and chi-square test.

A statistical package SPSS 17.0 was used to do the analysis. P<0.05 was considered as significant.

**Findings**

Among the 60 patients in Group C, 17 were males and 13 were females, whereas in Group L, 16 were males and 14 were females as shown in table 1.
The time for onset of sensory block in Group C was \(5.893 \pm 2.132\) minutes, in Group L was \(5.667 \pm 2.057\) minutes. Statistically insignificant with \(p\) value 0.682 as shown in table 2.

The time for onset of motor block in Group C was \(10.643 \pm 2.215\) minutes and in Group L was \(9.400 \pm 2.207\) minutes with a \(p\) value 0.037 (\(p<0.05\)) and statistically significant as shown in table 2.

The duration of sensory block in Group C was \(282.286 \pm 30.252\) minutes and in Group L was \(300.500 \pm 41.029\) minutes. The \(p=0.061\) (\(p>0.05\)) statistically insignificant as shown in table 3.

The duration of motor block in Group C was \(172.500 \pm 24.664\) minutes and in Group L was \(179.500 \pm 32.599\) minutes. The \(p=0.363\) (\(p>0.05\)) statistically insignificant as shown in table 3.

Among the 30 patients in Group C, 30% had complications like vascular puncture and inadequate blockade in 13.3%. Inadequate blockade alone in 10% of the patients. In 6.7% of the cases, the block failed to act completely.

Among the 30 patients in Group L, 3.3% had inadequate blockade. There was no vascular puncture in any of the patients as shown in table 4. In both the groups, no serious complications such as pleural puncture or pneumothorax were observed.

The \(p\) value for complications among the two groups was 0.041 (\(p<0.05\)) and statistically significant.
Discussion

The results of our study have proved that the lateral approach to the supraclavicular brachial plexus block is indeed a safer technique. Since the needle is passed parallel to the clavicle, away from the pleura, the chances of pneumothorax occurring are virtually nil. As for the vascular puncture, the subclavian artery lies away from direction of the needle.[5]

In the study done by Dr. Dilip Kothari, he was able to elicit paresthesia in all 250 patients [9]. Onset of sensory block was reported to occur within 3 minutes and motor block in 6-8 minutes. We achieved the sensory block in 5.667 ± 2.057 minutes and motor block in 9.400 ± 2.207 minutes. The faster onset may be attributed to the higher ratio of lignocaine used in his study. The duration of sensory block was 180-200 minutes and motor block was 120-150 minutes as reported by him. A longer duration of motor block 179.500 ± 32.599 minutes and sensory block of 300.500 ± 41.029 minutes in our study could be attributed to the higher amount of bupivacaine used in our study. He reported an incidence of vascular puncture of 6% which is higher than in our study. No other serious complications such as pleural puncture, pneumothorax etc occurred in either of the studies.

DK Sahu and Anjana Sahu reported that they had a success rate of 92% whereas we had a success rate of 96.667% [4]. The average time for sensory block in their study was 7.61 ± 2.82 minutes (mean ± SD), while it is 5.667 ± 2.057 minutes in our study. The duration for complete motor blockade was reported as 11.70 ± 2.50 minutes (mean ± SD), while it was 9.400 ± 2.207 minutes in our study. The faster onset of sensory and motor block can be due to the higher concentration of lignocaine used in this study 2% lignocaine with adrenaline against 1.5% lignocaine used by DK Sahu. The total duration of action of sensory block was 127.87 ± 14.57 minutes while it is 179.500 ± 32.599 minutes in our study. The total duration of sensory block was reported to be 2-12 hours in their study, whereas, it is 300.500 ± 41.029 minutes in our study. The longer duration of sensory block can be attributed to the usage of 0.5% bupivacaine instead of the 0.325% bupivacaine used in their study. Vessel puncture occurred in 20 patients in their study while we had no such occurrence.

A Kumar et al. reported the onset of sensory block of 7.33 ± 4.17 minutes similar to that of ours of 5.667 ± 2.057 minutes [3]. The analgesia lasted for about 180 ± 38.43 minutes in their study but we achieved a block lasting 300.500 ± 41.029 minutes. Also, they reported a duration of motor block of 176.57 ± 33.92 minutes similar to that achieved by us of 179.500 ± 32.599 minutes. Vascular puncture occurred in 3 cases in their study. The difference in duration of sensory block in between the two studies could be due to differences in drug manufacturing, cold chain maintenance etc.

In the study done by Pothula Krishna Prasad et al. the onset of sensory block took 8.5 ± 1.25 minutes and of motor block took 12.94 ± 1.72 minutes [10]. The faster onset in our study of 5.667 ± 2.057 minutes for sensory and 9.400 ± 2.207 minutes for motor block could be attributed to the higher amount of 2% lignocaine with adrenaline at 7mg/kg against the 1.5% lignocaine 10ml used by them. Total duration of action of sensory block was 192.65 ± 22.54 minutes and motor block was 186.25 ± 25.67 minutes as reported in above study. The motor block in our study for 179.500 ± 32.599 minutes was comparable to that reported by them but the higher duration of sensory block of 300.500 ± 41.029 minutes could be due to the higher amount of drug used in our study. Vessel puncture was reported in one case by them whereas we did not have any such incidence.

The above results demonstrate that the lateral approach is indeed safer. It has significantly lower rates of failed blocks, inadequate blockade, vascular puncture, pleural puncture etc. these all lead to a reduction in conversion rates to general anesthesia.

It has been successfully demonstrated that the addition of additives such as Dexamethasone [11], Dexmedetomidine [12], Hyaluronidase [13, 14], Fentanyl [15, 16], Morphine [15], Nalbuphine [17] etc. improve the duration and success rates of the block. Multiple studies have reported excellent degree of analgesia during intra-operative and post-operative period for up to 24hrs.

Newer studies using an indwelling catheter to provide continuous intra-op and post-op analgesia have yielded promising results and are set to bring in the next revolution in peripheral nerve blocks and regional anesthesia [18].

Conclusion

The lateral approach to supraclavicular brachial block is a safer and reliable alternative to the classical
approach. It has significantly lower rates of complications with the same efficacy in onset and duration of action as the classical approach. The lateral approach technique can be practiced more widely in developing countries where due to the economic constraints, the nerve stimulators and ultrasound are not available at most of the centers.

**Conflict of Interest:** None declared

**Source of Funding:** Self

**Ethical Clearance:** Institutional Ethics Committee, Kasturba Medical College, Mangalore. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

**Acknowledgments**

We would like to thank Kasturba Medical College, Mangalore and Manipal Academy of Higher Education, Manipal, Karnataka, India for their support in doing this study.

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An Interprofessional Approach in Reducing the Stress Levels of First Year Medical Students

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ABSTRACT

Background: Medical education is perceived as being stressful, and a high level of stress may have a negative effect on cognitive functioning and learning of students in a medical school.

Aims and Objectives:
1. To assess the stress levels in first year MBBS students.
2. Evaluate the effects of yogic techniques on their stress levels.

Materials and Method: This cross-sectional study was conducted among first year medical undergraduates. Institutional ethics committee clearance was obtained before beginning the experiments. A total of 100 1st year medical students from Kasturba medical college Mangalore were the participants in this study. Stress levels were assessed using perceived stress scale questionnaire. Yogic techniques were given for a period of 6 weeks and post intervention stress levels were assessed using student t test. Statistical package SPSS version 17.0 was used to do the analysis. Significance of the test was set at P<0.05.

Results: The overall response rate was 95%. The mean perceived stress score was 20.5 ± 3.36. In the high stress group average score was 22.84 ± 2.39 where as in the low stress group they had an average score of 15.8 ± 2.56. The stress levels were significantly higher in the high stress group. Yoga intervention significantly(p<0.0001) decreased the stress levels in the high stress groups from mean perceived stress scale score of 23.69(pre intervention) to 19.72 (post intervention) when compared to the low stress groups.

Conclusion: From the present study it is concluded that yogic intervention helps in reducing stress in medical students

Keywords: Yoga intervention, Medical students, Mental health.

Introduction

Educational stress emerges as a significant mental problem globally in recent years1. Around one third of the students experience stress that affect their scholastic performance, psychosocial adjustment along with their overall emotional and physical well being1. Poor academic performance, low peer admiration, psychosomatic symptoms, substance abuse are commonly seen among the students of academic stress without having any knowledge of techniques to overcome it.
In the first year of our MBBS curriculum we get students from all over the world. They come from different background and culture. They do have a lot of stress trying to settle in a new place and making friends. All this adds to the academic stress of the MBBS curriculum. The rate at which they learn things differ from one individual to another. This stress could have a role in their academic performance. Some perform well in the sessional exams whereas others do not.

Practice of Yoga has become increasingly popular in India as well as in western countries as a method for coping with stress and improving the quality of life. Yoga is one of the methods by which a goal of positive health can be achieved. Yoga plays a significant role in augmenting one’s mental health, which is instrumental for their fruitful performance in all domains of life.

This study is aimed at providing Yogic sessions to see effect in reducing the stress levels in First year medical students and improving their academic performance.

**Aims and Objectives**

1. To assess the stress levels in first year MBBS students.
2. Evaluate the effects of yogic techniques on the stress levels.

**Methodology**

This was a cross-sectional study conducted on first year MBBS students studying in a private medical college. Students (n=100) who have scored less in their sessional examination were taken for the study. They were then given the Perceived stress scale Questionnaire to get a baseline data. The perceived stress scale is a globally accepted test for measurement of stress which is a ten-item questionnaire that poses general questions allowing users to respond according to their personal stressors. Questions are based on a five point Likert scale. Scores range from zero to forty with higher scores indicating higher levels of perceived stress. Based on their scores students are divided into high stress group (Score ≥20, n=70) and low stress group (Score <20, n=30). Students in each of these groups are equally divided by simple randomization into the control group (n=50, 35 high stress and 15 low stress) who were not given any intervention on yoga, and the intervention group (n=50, 35 high stress and 15 low stress) who were given yogic intervention.

**Intervention Detail:** Students were given daily yoga sessions by a qualified yoga teacher in the Department of Physiology. Yogic sessions were given 3-4 hours after meals which was at 5:00 pm. Sessions were conducted for a period of 40 minutes in the evening for 5 days a week for a duration of 6 weeks. The yoga module consisted of Asanas, Bandha Mudra, Pranayama, Meditation and relaxation for a duration of 40 min. Intervention was given to the students which was for 6 weeks (12th March 2018-20th April 2018).

The pre and post interventional data of both control group and Intervention group were collected in the following way:

Self-assessed reduction in Stress levels will be assessed using Perceived stress scale questionnaire.

**Statistical Method:** Comparison between high stress group and low stress group was done using Student’s unpaired t test and paired t test by SPSS(version 16) software.

**Results**

**Table 1: Comparison of PSS scores of students**

<table>
<thead>
<tr>
<th></th>
<th>High stress group (n=70)</th>
<th>Low stress group (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSS SCORES</td>
<td>22.84 ± 2.39***</td>
<td>15.8 ± 2.56</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SD

*** p<0.0001 when low stress group was compared with high stress group.

**Table 2: Comparison of PSS scores in students before and after yoga intervention in High stress students**

<table>
<thead>
<tr>
<th>Before intervention - test score (n=35)</th>
<th>After intervention - test score (n=35)</th>
<th>Mean difference</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean ± SD</td>
<td>mean ± SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.69 ± 3.28</td>
<td>19.77 ± 3.75</td>
<td>3.91</td>
<td>6.94</td>
<td>&lt;0.0001***</td>
</tr>
</tbody>
</table>
Table 3: Comparison of PSS scores in students before and after yoga intervention in Low stress students

<table>
<thead>
<tr>
<th></th>
<th>Before intervention - test score (n=15)</th>
<th>After intervention - test score (n=15)</th>
<th>Mean difference</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean ± SD</td>
<td>16 ± 3.27</td>
<td>15.27 ± 2.69</td>
<td>0.73</td>
<td>0.97</td>
<td>0.35 (NS)</td>
</tr>
</tbody>
</table>

The response rate was 95%. Of 105 students 100 completed and returned the questionnaire giving an overall response rate of 95.32%. The results of the following study showed that in the slow learners, the high stress group had an average score of 22.84 ± 2.39, where as in the low stress group they had an average score of 15.8 ± 2.56 after analyzing the PSS questionnaire. On comparison of high stress group with low stress group there was significant increase in stress score in high stress group(p<0.0001) Yoga intervention significantly(p<0.0001) decreased the stress levels in the high stress groups when compared to the low stress groups. (Table 2)

Discussion

The first part of my study has given a lot of insight about the stress levels in medical undergraduates. The first year medical undergraduates do have a lot of stress which was reflected in their perceived stress scale scores. Previous studies have shown that academic curriculum, increased number of examinations, competition with fellow mates were sources of anxiety among medical undergraduates. [5,6,7,8,9,10]. This could exaggerate the already existing problems such as the stress of new place and friends.

Our results have shown that there is significant reduction in the stress levels after 6 weeks of Yogic intervention. This is in accordance to another case control study conducted by Lona Prasad et al. Yoga is gaining prominence in boosting the mental health and in the treatment of psychiatric and psychosomatic disorders. This has a direct effect on the quality of their life. As medical students are the footing of the medical profession, they ought to be be aware of this complementary therapy of yoga for the enhancement of their own mental health and that of their patients.

Limitations

This a cross-sectional study conducted only in one medical college and lacks generalization of results. Since the information was obtained from a self-administered questionnaire, information bias cannot be ruled out.

Conclusion

From the present study it is concluded that yogic intervention helps in reducing stress in medical undergraduates.

Implications: The high stress in medical undergraduates could be a reason for their poor performance in the sessional exams and addressing them by some measures may boost up their confidence and mental health and give the society better doctors in the long run.

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Conflict of Interest: All the authors hereby declare that there is no conflict of interest

Source of Funding: Self

Ethical Clearance: Taken from the institutional ethics committee

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Optimization Techniques to Solve Waste Management Problem: A Review

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ABSTRACT

With the development of advanced technology in the recent years there is an enlargement in the generation of waste. There are different sources of waste generation such as industries, hospitals, etc. This paper provides a review on different type of waste management problems such as biomedical waste management, Solid waste management, Hazardous waste management etc. There is a need to manage this waste properly within short time period because it affects the people lives and environment. Therefore, the waste management problems have become more and more complex in today’s life. To dispose the waste within short time there is need to optimize some factors like distance, time and number of vehicles used for the collection and transportation of waste. This paper focuses on the different optimization techniques such as Genetic Algorithm (GA), Ant Colony Optimization (ACO) and Modified multi-Objective Ant Colony Optimization (MOACO), etc. to solve the waste management problems using Vehicle Routing problem (VRP).

Keywords: Vehicle Routing Problem, Genetic Algorithm, Biomedical Waste Management, Ant Colony Optimization, Modified multi-Objective Ant Colony Optimization.

Introduction

Waste Management is a global issue that has become a serious concern in people lives because there is an increment of new problems which indirectly influences the society/environment. The waste generated from the different sources like hospital, industries, etc. can be hazardous. It may cause the dreadful effects if it is not managed properly. Hence, it is very important to dispose the biomedical waste or hazardous waste as early as possible because there are many issues such as vehicle failure, road accidents; traffic problems, Lack of infrastructure and many more during transportation of waste.

In last few years, researchers⁴,⁵ mainly focused on the transportation of waste but they have not considered the risk associated with transportation of waste. Risks associated with transportation of wastes are traffic problem, road accident, etc. Sudden vehicle failure or accident leads in to dumping of waste anywhere on the road and it turns into the environment pollution. So in such situation there is need to work. On path planning approach using some advanced technology.

In recent years, researchers⁵,¹² focused on waste management method by using different optimization techniques. They applied different optimization techniques to minimize the risk, cost and to optimize the distance so waste will dispose in short time at the disposal site. This paper mainly focused on different reviews and different optimization techniques used for the waste management.

The outline of the paper is organised as follows: In the section II, different waste management categories has been discussed. Section III explains research in the field of waste management using different optimization techniques. The related research work is divided further into three different categories. First category includes optimization techniques used for the BMW management. The second category includes different optimization techniques used for the hazardous waste management and the third category is related to the solid waste management using optimization techniques. Section IV discusses about the conclusion and the future scope and Section V includes the overview of some important research papers.

Waste Management: It is significantly essential to manage the waste generated within the hospitals properly so as to avoid health problems and environmental
It includes soil, water and air pollution where as humans have to fight with infectious diseases like HIV, hepatitis etc. essential to manage the biomedical waste properly. In last few years, many researchers worked on issues related to biomedical waste and they focused on collection, separation, treatment of biomedical waste in hospital by using bins. There is a need to focus on safe transportation of biomedical waste. In the year of 2016, author 12 works on network optimization in the field of BMW. Then in the year of 2018, Radhika and Ajay1 introduced, modified Multi-Objective Ant Colony System (MOACS) technique supported by clustering algorithm to obtain optimum and safe routes for biomedical waste complex transportation (BMWCT) problem. In this paper, the MOACS algorithm is used in BMW management to solve the complex transportation issues. The multiple depot and disposal facility are considered to optimize the transportation risk associated with the collection and transportation of waste.

Hazardous material generated from industries or any other sources are dangerous. It includes wastes from electroplating, metal finishing operations, chemicals, etc. There are different techniques proposed by different researcher2,3 to manage the hazardous waste collection. Vehicle routing and scheduling technique is used for the planning of hazardous waste collection and disposal. This technique is also used to optimize the route for the hazardous waste collection 3. Genetic Ant Colony Optimization Algorithm (GACO) is proposed by a researcher6 which is used for the real time garbage collection study. A fuzzy bi-level programming model is developed by researchers2 to minimize the total transportation risk of delivering products of hazardous materials from multiple depots. Disposal of solid wastes is major problem in both urban and rural areas of many developed and developing countries. To solve this problem, some researchers have worked on some policies to define the rules for the MSW13. One of the major environmental problems is the collection, management and disposal of the MSW in the urban areas. The sources of solid waste include residential, commercial, institutional, and industrial activities. Lack of MSW management and disposal is leading to significant environmental problems. This includes soil, air water, and aesthetic pollution. Such environmental problems are associated with human health disorder. Many researchers 10,11 worked on the municipal solid waste collection using vehicle routing problem to minimize the transportation risk.

The main problem related to the waste management is the improper transportation of waste at disposal site. In this paper, authors1-13 mainly focused on waste management problem using different optimization techniques. These optimization techniques are used to optimize the distance between collection point and the disposal site using vehicle routing problem2. Fig 1 shows the scenario of various depots and hospitals. Fig 2 shows the group of nearby depot and hospital to collection of waste2. In this scenario, distance between depot and hospital is calculated based on Euclidean distance method31. Then the vehicle starts from one of the depot based on calculated distance search for nearby hospital then collects the waste from different hospitals till the capacity of vehicle and come back to the depot to dump the waste. This method helps to proper management of biomedical waste within time and also optimizes the distance, time and cost associated with the collection and transportation of waste. In this figure, depot and disposal site have been considered at the same location.

![Fig. 1: Scenario for depot and hospital](image1)

![Fig. 2: Group of depot and hospitals](image2)
Related Research Work: In this paper, comparative analysis of various optimization algorithms for the waste management problem have been studied.

Biomedical Waste Management: This section focuses on the research in the field of BMW management and the problems within the field of BMW, faced by individuals and the environment due to improper management of BMW.

Need for Biomedical Waste Management: In the year 2012, Mathur et.al. focused on the basic issues of BMW Management. In this paper authors discussed about improper management of waste generated in health care facilities, how it impacts on the community, health care workers and the environment. Large amount of infectious and hazardous waste are generated in the health care hospitals. Unplanned disposal of BMW or hospital waste and exposure to such waste possess serious threat to environment and human health. In this paper researchers explained the classification of BMW such as General Waste, Pathological, Radioactive, Sharps, Pharmaceuticals, etc. Researcher also defined the major sources of generation of BMW such as Govt. hospitals, private hospitals, nursing homes, primary health centres. Mainly researchers explained the need for the BMW, the BMW management process, rules and benefits of BMW management.

Healthcare Waste Management: In the year 2016, Ankur Chauhan et.al. focused on numerous future research directions towards BMW management in healthcare. In this paper, researchers worked on the requirement of more in-depth application of operations management tools and techniques in the field of BMW. Researchers were worked on the unaddressed issues related to a healthcare waste management i.e. inventory management, warehousing, bins allocation, routing and transportation. Also explained the importance of effective management of healthcare waste.

Vehicle Routing Problem: This paper, focused on distance optimization using network optimization strategy. The main model of the network optimization is VRP. The medical waste generated from small hospitals and clinics can be transported to the nearby bigger hospitals because bigger hospitals have enough space to accommodate the medical waste generated from nearby clinics. So, it helps to optimize the distance and the cost associated with the collection and transportation of medical waste generated from small clinics. In this paper, two-three hybrid networks are designed by researchers to cluster the bigger hospital and nearby small clinics. These networks are helped to transport the waste generated in small clinics to the bigger hospital. Through this network strategy, author worked on path optimization to decrease the total travel distance.

Modified multi-Objectives Ant Colony System: In the year 2018, paper discussed the development of a modified ACS-based approach to determine the optimal and safest route for (BMW) collection and transportation. In this problem, researcher considered the number of vehicles, multiple depot, disposal site and hospitals. Vehicle starts from depot, collect the biomedical waste from respective hospitals and dumps to the disposal site by satisfying the defined constraints like vehicle capacity and time window. The objectives considered by the researchers are route selection of vehicles, risk associated with the collection and transportation of BMW, total scheduling time of vehicles and number of vehicles. In this method, clusters of the hospital nodes are comprised based on their distance from the nearest depot and late time window associated with the hospital node. The distance is calculated by Euclidian Distance Method. This algorithm was tested on real time data as well as on standard data. The results obtained using MOACO algorithm gives good results with deviation less than 5% compared to the standard best solutions.

Hazardous waste/material Management: This section explains the different issues in the management of hazardous waste. Many researchers are worked on various optimization techniques. In this section, different optimization techniques for the hazardous waste management are explained by the authors.

Vehicle routing and scheduling technique: In paper, the authors have introduced a vehicle routing and scheduling technique for the planning of hazardous waste collection and disposal. In this method clients requests for waste withdrawal in order to find shortest distances, maximization of amount of collected waste and maximization of commercial value of withdrawals. It considers constraints on vehicles capacity and availability, lunch break requirements, working hour’s limits, the need to keep the different type of hazardous waste separated and the time restrictions. The short computational time approach is used which is suitable for evaluating alternative plans, as well as managing late
orders or urgencies. This study has more computational complexity while handling very large number of requests to service.

**Genetic Ant Colony Optimization Algorithm (GACO):** In this paper\(^7\), the researchers worked on capacitated vehicle routing problem with fuzzy demand to solve the garbage collection case study. The GACO algorithm is developed by the researchers to improve the performance of ACO and the GA. This algorithm is used for the real time study of garbage collection. The proposed GACO algorithm is compared with other existing algorithms for solving CVRP. The proposed method improves initialization of typical ACO by employing Prims algorithm. The crossover and mutation steps are integrated in ACO to accelerate the local and global exploration. The proposed GACO algorithm is able to handle the CVRP with fuzzy demand using fuzzy credibility measurement theory.

**Multi-Depot Vehicle Routing Problem (MDVRP):** In paper\(^2\), four fuzzy simulation-based heuristic algorithms are designed by the authors for obtaining the optimal solution to the proposed model. For modelling MDVRP for hazardous materials transportation, the authors have concentrated on the goal of minimizing transportation risk. To calculate the risk, the problem is divided into two levels of formulations. The upper level formulation allocates customers to depots under the constraints of depot capacities and customer demands, while the lower level determines the optimal path for each group of depots and customers. Comparative analysis was done to evaluate their performances for searching the optimal routing and allocation strategy. Incorporating the historical information of road accidents from urban transportation systems is used to find the risk associated with the transportation of hazardous materials. Risk is difficult to define accurately that’s why researcher does the formulation of the MDVRP for transportation of hazardous materials. In this study, number of depot and the location are not fixed.

**Municipal solid waste:** Municipal solid waste is the emerging issues because amount of waste generated from the society is more. So to manage the municipal solid waste different optimization techniques are explained by the different researchers.

**Vehicle Routing Problem:** In the year 2012, Katja Buhrkal\(^10\), worked on the Waste Collection Vehicle Routing Problem with Time Windows (WCVRPTW) in a city logistics context. In this paper, researchers worked on the cost optimization with finding of optimal route for garbage collection. Researchers proposed an adaptive large neighbourhood search algorithm for solving the waste collection problem. The objective of the WCVRPTW is to find a set of routes for the vehicles, minimizing total travel cost and satisfying vehicle capacity such that all customers are visited exactly once and within their time window.

**Optimization of solid waste systems:** In this paper\(^11\), researchers worked on the municipal solid waste management using optimization technique. Mathematical model has been developed and tested it by using the real data from Ilala Municipal in Dares Salaam Tanzania. The formulated model resulted into lower cost of transporting solid waste from sources to collection points.

**Conclusion and future scope:** In this paper author review the literature on waste management using VRP with different optimization techniques. It also explains about different waste management types and the research related to waste management using different optimization techniques. It also gives idea about previous and current waste management scenarios. Researchers focused on to find the optimal path for the transportation of waste but they are not focused on vehicle failure problem. In future researchers may work on some advanced technology like artificial intelligence to solve waste management problem. It will help for safest transportation of hazardous and non-hazardous.

**Ethical Clearance:** Not required as it is a review article.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**REFERENCES**


Risk Factors and Clinical Characteristics of Stenotrophomonas Maltophilia Infections

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ABSTRACT

Stenotrophomonas maltophilia is a non-fermenting, aerobic, gram-negative bacillus that shows multi-drug resistance and is an opportunistic and nosocomial pathogen.

It causes infections like pneumonia, bacteremia, endocarditis, meningitis, bone and gastrointestinal infections, which may lead to septic shock.

This study was undertaken to evaluate the clinical and microbiological profile of this emerging pathogen since not many studies about this organism have been done in India.

This retrospective study was conducted at a tertiary care hospital of Karnataka, India for two years (2014-2015).

Demographic and clinical data of patients was collected from medical records section and then analyzed using SPSS 11.0

**Keywords:** Stenotrophmonas maltophilia, antibiotic resistance, immunocompromised, critical care, antibiotic therapy, opportunistic infections, infectious diseases

Introduction

Stenotrophomonas maltophilia is an aerobic, non-fermenting, gram negative bacterium. First isolated in 1943, it was classified as Bacterium bookeri and later renamed to Pseudomonas maltophilia in 1961. It was also grouped under Xanthomonas in 1983 before being finally classified as Stenotrophomonas maltophilia in 1993. It is motile due to presence of polar flagella and grows well on MacConkey Agar producing pigmented colonies. S. maltophilia is catalase positive, oxidase negative and has a positive reaction for extracellular DNase. S.maltophilia is found in the environment and frequently colonizes humid surfaces like catheters and endoscopes.¹

It is known to produce beta lactamases which make it resistant to beta lactam antibiotics such as carbapenems. Many strains are sensitive to ticarcillin and trimethoprim-sulfamethoxazole, but antibiotic resistance has been increasing. It is emerging as a global multi -drug resistant organism and can cause nosocomial infections in immunocompromised patients². Of these, the most common are respiratory tract infections. Risk factors include mechanical ventilation, diabetes mellitus, tuberculosis, surgery, trauma, catheterization and prolonged hospitalization³

S.maltophilia does not produce any significant virulence factor and is therefore considered to be an organism with low virulence. It is generally regarded as an opportunistic pathogen, especially in immunocompromised hosts. Its ability to survive and colonise on humid surfaces, to form biofilm and its resistance to a number of antimicrobial agents by virtue of possessing several mechanisms that confer resistance to a number of antimicrobial agents help it to cause infections.⁴

Malignancy especially hematologic, transplantation, human immunodeficiency virus (HIV) infection, cystic fibrosis, prolonged hospitalization, intensive care unit
(ICU) admission, mechanical ventilation, indwelling catheters, corticosteroid or immunosuppressive therapy, and recent antibiotic treatment are some of the risk factors associated with \textit{S.maltophilia} infections.\[^5\]

\textit{S.maltophilia} causes a wide range of infections including respiratory tract infections (RTI), bloodstream infections (BSI) and, less commonly, skin and soft tissue infections (SSTI), bone and joint infections, biliary tract infections, urinary tract infections, endophthalmitis, endocarditis, and meningitis.\[^6\]

\textit{S. maltophilia} pneumonia is usually hospital-acquired and most frequently occurs in mechanically ventilated patients. Compared with pulmonary colonization, infection is associated with underlying immunosuppression.\[^7\]

Most cases of \textit{S. maltophilia} bacteremia are associated with indwelling catheters.

In a study conducted on 207 oncology patients with a central venous catheter and \textit{S.maltophilia} bloodstream infection, 73 percent of infections were found to be catheter-related, 22 percent were secondary (mainly from a pulmonary source), and 5 percent were thought to be primary and non-catheter related. Most of the catheter-related \textit{S. maltophilia} bloodstream infections are polymicrobial.\[^8\]

Our study was a retrospective study of two years duration between January 2014 and December 2015. The study was conducted in a 850 bed referral hospital in South India after approval from the institutional ethics committee. All clinical samples which were culture positive for \textit{S.maltophilia} from January 2014 to December 2015 were included in this study.

\textbf{Materials and Method}

This study was conducted in a tertiary care hospital of Karnataka taking into account cases for two years:2014-2015. Demographic and clinical details of the patients which include age, gender, clinical presentation, associated risk factors and comorbidities, radiological findings, use of antimicrobial therapy and prognostic outcomes was collected from the medical records. Culture reports of the patients were collected to study bacteremia due to \textit{S.maltophilia}. Clinical and radiological findings of the patient were correlated and compared to assess the clinical significance of \textit{S.maltophilia} isolates. Lower respiratory tract samples including sputum, endotracheal aspirates or bronchoalveolar lavage fluid (BAL) from patients’ with symptoms and signs of LRTIs were processed by microscopy and culture. Microscopy was done according to Bartlett’s grading system. Culture for all the respiratory samples was done on sheep blood agar, MacConkey agar and chocolate agar and incubated at 37°C for 18-24 hours in 5-10% CO2. Culture for ET aspirates and BAL specimens were done quantitatively.

The obtained data was subjected to statistical analysis by SPSS version 11.0

\textbf{Results}

\textit{S. maltophilia} was isolated from a total of 40 samples

Maximum number of patients (15) presented with fever as the chief complaint. Trauma and respiratory distress with breathlessness and cough were reported as complaints by 10 and 11 patients respectively.

Maximum number of patients belonged to the age group of 51-60 (8;20%). Patients aged 41-50 and 61-70 accounted for 7 cases (17.5%) each of the studied population.

26(65%) of the studied cases were males while 14(35%) were females.

Of the total 40, 30 cases resolved the infection and 10 deaths were reported.

The presence of risk factors in the patients was as shown in following figure:

\textbf{Figure 1: Presence of risk factors in Patients}

As seen in the chart above, hypertension and Diabetes emerged as major risk factors. They were reported in 14(23.7%) and 12 (20.3%) cases respectively.
Table 1: Procedures performed in hospital

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Ventilation</td>
<td>12</td>
</tr>
<tr>
<td>Nebulization</td>
<td>7</td>
</tr>
<tr>
<td>Catheterization</td>
<td>8</td>
</tr>
<tr>
<td>Tracheostomy</td>
<td>10</td>
</tr>
<tr>
<td>Endoscopy</td>
<td>10</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>8</td>
</tr>
<tr>
<td>Surgery</td>
<td>10</td>
</tr>
<tr>
<td>Tumor excision</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 1 shows the number of patients who underwent a particular procedure while they were admitted in the hospital.

Of all the patients detected with *S. maltophilia* infections, 12(30%) had mechanical ventilation. These patients were usually associated with intensive care unit stay and prolonged admission.

Table 2: Antibiotic sensitivity pattern

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Sensitivity</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>30(75.0%)</td>
<td>10(25.0%)</td>
</tr>
<tr>
<td>Amoxiclav</td>
<td>12(30.0%)</td>
<td>28(70.0%)</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>15(37.5%)</td>
<td>25(62.5%)</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>11(27.5%)</td>
<td>29(72.5%)</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>10(25.0%)</td>
<td>30(75.0%)</td>
</tr>
<tr>
<td>Cefoperazone/sulbactam</td>
<td>29(72.5%)</td>
<td>11(27.5%)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>31(77.5%)</td>
<td>9(22.5%)</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>34(85.0%)</td>
<td>6(15.0%)</td>
</tr>
<tr>
<td>Imipenem</td>
<td>30(75.0%)</td>
<td>10(25.0%)</td>
</tr>
<tr>
<td>Piperacillin/Tazobactam</td>
<td>33(82.5%)</td>
<td>7(17.5%)</td>
</tr>
<tr>
<td>Trimethoprim-Sulfamethoxazole</td>
<td>29(72.5%)</td>
<td>11(27.5%)</td>
</tr>
</tbody>
</table>

Our isolates of *S. maltophilia* showed maximum sensitivity to Gentamicin and Piperacillin/Tazobactam(85%)

Least sensitivity was seen with Ceftazidime (25%).

Maximum resistance was seen with Ceftazidime (75%)

Minimum resistance was seen with Gentamicin (15%)

Table 3: Association between age and outcome

<table>
<thead>
<tr>
<th></th>
<th>Resolved</th>
<th>Died</th>
<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age ± SD</td>
<td>45.372 ± 21.63</td>
<td>62.10 ± 16.67</td>
<td>0.748</td>
<td>0.032</td>
</tr>
</tbody>
</table>

A significant correlation was found between the age and death as a outcome in patients with p value of 0.032

25%(10) cases succumbed to infection whereas 75% (30) resolved the infection successfully.

Discussion and Conclusion

A retrospective study conducted in Southern India by Gupta, Chawla and Vishwanath [9] in 2014 found *S.maltophilia* to be an important nosocomial pathogen in Lower Respiratory Tract infections. The study showed a predisposition to infection amongst elderly males (>55 ys of age). 72% of the patients in this study were diagnosed with pneumonia. In our study, *S.maltophilia* was more commonly isolated from males (65%) than females (35%). Our study showed the mean age of patients who resolved the infection was 45 and those who died was 65 indicating that age has an important role in outcomes. Immunosuppressed status and invasive procedures performed in the hospital were identified as major risk factors for acquiring the infection. Diabetes and hypertension have emerged as the major risk factors for *S.maltophilia* infections. Of those infected, 35% had diabetes and 30% had hypertension.

Mechanical ventilation was performed on 30% of the cases studied. 25% of the patients studied underwent tracheostomy and endoscopy. *S.maltophilia* may be present as a surface organism that gains access when invasive procedures are performed. It is noteworthy that the most common chief complaint was fever(37.5%) followed by respiratory distress/COPD(27.5%).

A study carried out by J. Brooke found immunocompromising conditions, malignancy, indwelling catheters and long term ICU stay to be one of the important risk factor. This study has implicated beta lactamase production and intrinsic genetic mechanisms to be the cause of antibiotic resistance. This study showed good sensitivity to trimethoprim-sulfamethoxazole and ticarcillin [10]. In our study the isolates of *S.maltophilia* showed sensitivity to Gentamicin (85%) and Piperacillin/Tazobactam (82.5%). *S.maltophilia* in our study showed significant resistance to amoxiclav (70%), cefotaxime (72.5%) and ceftazidime. (75%). Trimethoprim-sulfamethoxazole is an effective antibiotic for the treatment of *S. maltophilia* infections but it’s adverse effects have caused limitations in use [11]. Trimethoprim/sulfamethoxazole (used in 12.5% cases) and piperacillin/
tazobactam (used in 20%) cases were the most effective antibiotics. Of those treated 72.5% showed resolution of infections whereas 27.5% cases ended in death. Presence of sul1 and sul2 genes on plasmids, integrons and transposons may cause antibiotic resistance. Resistance to beta lactamase resistance is due to low membrane permeability.[12][13]

A study conducted by Mehmet Mutlu et al in Turkey on neonates found ventilator associated pneumonia to be the main cause of *S.maltophilia* in neonates. In our study, two neonatal cases were encountered, one of the neonates had mechanical ventilation and one had congenital abnormality namely patent foramen ovale.[14]

Our results showed old age, immunocompromised status and long standing chronic illnesses to be a major risk factor for *S.maltophilia* infections. The mean age for those with resolved infection was found to be 45 whereas the age of those who died was found to be 65 on statistical analysis. In our study the isolates of *S.maltophilia* showed good sensitivity to Gentamicin (85%) and Piperacillin/Tazobactam (82.5%).

From this study we conclude that *S.maltophilia* can cause serious infections in in patients with underlying risk factors. It is essential to utilize the available antimicrobials appropriately, use novel agents to which the organism is susceptible, and to strictly apply infection control measures in order to decrease the incidence of infections caused by *S. maltophilia*.

Attempts to identify this organism in the laboratory must be done and should be Sensitivity reports must be taken into consideration for treatment options. More studies should be done to establish a regimen for *S. maltophilia* infections.

**Ethical Clearance:** Taken from Institutional Ethics Committee, Kasturba Medical College, Mangalore, Manipal University

**Source of Funding:** Self/ICMR, New Delhi Short term studentship 2016

**Conflict of Interest:** Nil

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11. Chung H, Hong S, Lee Y, Kim M, Yong D, Jeong S et al. Antimicrobial Susceptibility of


Prevalence of Acute Respiratory Infection and the Associated Risk Factors: A Study of Children Under Five Years of Age in Tribal and Coastal Areas of Odisha, India

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ABSTRACT

The present study was undertaken to observe the status and regional variations in acute respiratory infections (ARI’s) among the children below 5 years age group in coastal and tribal regions of the state Odisha, India. Hospital-based cross-sectional study. Fisher’s exact test using Graph Pad Prism 5.0 was used for comparison of different risk factors associated with ARI’s

Prevalence of ARI was 20.9% (3513/16769), in tribal region and its 26.8 % (1988/7401) in coastal region 16.2 % (1524/9368). Out of 303 coastal cases 64.6% were males and from 300 tribal cases, 58.6% were females (p<0.0001, OR=2.600). Low birth weight children suffered severe forms of ARI were more in tribal region 59.3% compared to coastal region 36.6% (P=0.0001, OR=0.3962). Bivariate analyses indicated that overcrowding (OR=0.613), cross ventilation (OR=1.403); low birth weight and mother’s age were significantly associated with ARI. Fever (73.2%) and cough (73.8%), were the most frequently reported clinical symptoms.

Keywords: Pneumonia, Morbidity, Infant, Social Class, Maternal Age, Respiratory Tract Infections.

Introduction

Acute Respiratory Infection (ARI) appears as a single largest contributor of under-five childhood morbidity and mortality [1, 2]. World Health Organization (WHO), states that the ARI is 10 major diseases and one of the most common causes of death in infants. In developing countries ranges from 30-70 times higher than developed countries and allegedly 20% of infant mortality each year are caused by ARI. According to the World Health Organization (WHO) estimates, in 2012, globally 15% of the 6.5 million deaths in children <5 years of age were because of ARI In India, 14% of 1.4 million deaths in this age group in 2012 were attributed to ARI[3]. The potential threat of ARI has been recognized as one of the major challenges for its prevention and control in reproductive and child health programs in India [4].

There are both biological and social reasons that epidemiology of ARI differs across geographic and climatic zones. High morbidity for ARI has been encountered among under-five children admitted or treated in different pediatric hospitals in state of Odisha. The present study is envisaged to determine and assess the risk factors that affect the prevalence of ARIs in under-five in the tribal and coastal populations of Odisha.

Material and Method

Study Design and Ethics: According to the geographical pattern, Odisha can be divided into two distinct regions
viz., coastal and other hilly region. The current cross-sectional study was undertaken among under-five children presenting with ARI admitted or attained to Sardar Vallabhbhai Patel (SVP) Pediatric Hospital at Cuttack district, and District Headquarter Hospital (DHH), Rayagada, Odisha during the period from August 2015 to July 2016. A written consent for participation in the study was obtained from legal guardians of all patients. The study was approved by institute ethical committee. Pediatric patients (≤5 years old) presented with at least two of the following symptoms like cough, pharyngeal discomfort, nasal obstruction, sneeze and respiratory distress. Patients with a history of chronic respiratory infections or whose parents'/guardians refused to give consent were excluded from the study. The relevant socio-demographic and epidemiological information of the cases were collected by interviewing the parents/guardians of the children.

Statistical Analysis: Fisher’s exact test was conducted to compare the different associated risk factors between coastal and tribal children using Graph Pad Prism 5.0. Probability values of P<0.05 were considered significant.

Findings
A total 16,769 of admissions were made during the study period, of which 3513(20.9%) suffered from ARI. Occurrence of ARI was more in tribal region 1988/7401 (26.8%) as compared to coastal region 1525/9368 (16.2%). Out of 3513 ARI children, 603 (303 coastal and 300 tribal) cases were included in the study. About half (54.3%, n=328) were below 1 year of age, 39.9% (n=241) were between 1-4 yrs of age and 5.6% (n=34) were in 4-5 yrs of age group. The comparison of ARI patients between tribal and coastal region demonstrated that 70.6% children of below 1 year age with ARI belonged to the coastal region. Sex wise distribution found a significant difference in coastal and tribal children (p=0.0001, OR=2.600) (Table 1).

Table 1: Factors associated with acute respiratory infection among children under five in Tribal and Coastal areas of Odisha

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Number of cases (%)</th>
<th>P-value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coastal area (303)</td>
<td>Tribal area (300)</td>
<td></td>
</tr>
<tr>
<td>Case collection</td>
<td>Hospitalized</td>
<td>222(73.2)</td>
<td>161(53.6)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>OPD</td>
<td>81(26.7)</td>
<td>139(46.3)</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>Upper (I)</td>
<td>36(11.8)</td>
<td>22(7.3)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Upper middle (II)</td>
<td>43 (14.1)</td>
<td>34 (11.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper Lower (III)</td>
<td>104 (34.3)</td>
<td>52 (17.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower (IV)</td>
<td>120 (39.6)</td>
<td>192 (64)</td>
<td></td>
</tr>
<tr>
<td>Over crowding</td>
<td>Yes</td>
<td>189 (62.3)</td>
<td>219(73)</td>
<td>0.0054</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>114 (37.6)</td>
<td>81 (27)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>196 (64.6)</td>
<td>124 (41.3)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>107 (35.3)</td>
<td>176 (58.6)</td>
<td></td>
</tr>
<tr>
<td>Mother’s Age</td>
<td>≥19</td>
<td>32(10.5)</td>
<td>112(37.3)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>20-24</td>
<td>89(39.3)</td>
<td>89(29.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25-29</td>
<td>71(32.4)</td>
<td>40(13.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-34</td>
<td>61(26.1)</td>
<td>42(14.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-39</td>
<td>28(9.2)</td>
<td>17(5.7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-44</td>
<td>22(7.2)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Mother’s education</td>
<td>Illiterate</td>
<td>78(25.7)</td>
<td>210 (70)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>146 (48.1)</td>
<td>49 (16.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle/High school</td>
<td>79 (26)</td>
<td>41 (13.6)</td>
<td></td>
</tr>
<tr>
<td>Birth Weight</td>
<td>≤2.5</td>
<td>111 (36.6)</td>
<td>178 (59.3)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>≥2.5</td>
<td>192(63.3)</td>
<td>122(40.6)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>Smoking</td>
<td>113 (37.2)</td>
<td>222 (74)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>No smoking</td>
<td>190 (62.7)</td>
<td>78 (26)</td>
<td></td>
</tr>
<tr>
<td>Cross ventilation</td>
<td>Adequate</td>
<td>169 (55.7)</td>
<td>142 (47.3)</td>
<td>0.0417</td>
</tr>
<tr>
<td></td>
<td>Inadequate</td>
<td>134 (44.2)</td>
<td>158 (52.6)</td>
<td></td>
</tr>
</tbody>
</table>
Out of 303 coastal cases 196 (64.6%) were males and out of 300 tribal cases, 176 (58.6%) were females (Fig 2). On the basis of clinical manifestations, the children were found to be associated with Bronchopneumonia 55.8%, severe pneumonia 19.5%, Pneumonia 16.7%, and any ARI 7.8%. Significantly more cases from the tribal facility had fever, 300 (100%) compared with 141 (46.6%) from the coastal facility (p=0.0001). Other characteristics that were common were wheezing 76 (25%) and high pulse rate 61 (20.2%) cases from the tribal site and dyspnoea was reported in 58 (19.2%) from the coastal health facility (as displayed in Table 2).

### Table 2: Age wise distribution of different ARI cases below 5 years age group

<table>
<thead>
<tr>
<th>Age</th>
<th>Pneumonia (%)</th>
<th>Broncho Pneumonia (%)</th>
<th>Severe pneumonia (%)</th>
<th>Any ARI (%)</th>
<th>Total ARI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>243 (72)</td>
<td>44 (43.5)</td>
<td>73 (61.9)</td>
<td>16 (34)</td>
<td>376 (62.3)</td>
</tr>
<tr>
<td>1-2</td>
<td>46 (13.6)</td>
<td>24 (23.8)</td>
<td>28 (23.7)</td>
<td>14 (29.8)</td>
<td>112 (18.8)</td>
</tr>
<tr>
<td>2-3</td>
<td>18 (5.3)</td>
<td>14 (13.8)</td>
<td>12 (10.2)</td>
<td>5 (10.6)</td>
<td>49 (8)</td>
</tr>
<tr>
<td>3-4</td>
<td>17 (5)</td>
<td>12 (11.8)</td>
<td>3 (2.5)</td>
<td>7 (14.9)</td>
<td>39 (6.7)</td>
</tr>
<tr>
<td>4-5</td>
<td>13 (3.8)</td>
<td>7 (6.8)</td>
<td>2 (1.7)</td>
<td>5 (10.6)</td>
<td>27 (4.8)</td>
</tr>
<tr>
<td>Total</td>
<td>337 (55.9)</td>
<td>101 (16.8)</td>
<td>118 (19.7)</td>
<td>47 (7.8)</td>
<td>603</td>
</tr>
</tbody>
</table>

Out of 603 cases, low birth weight (≤2.5 kg) children were 289 (47.9%). In tribal region low birth weight children (59.3%) were more as compared to coastal region (36.6%). The severity of ARI was very high in low birth weight baby (≤2.5, 36%) as compared to normal birth weight baby (≥2.5, 17.3%) (Fig.-1). In this study, low birth weight was significantly related to ARI (p=0.001). Based on Table 1 shows that 300 coastal cases risky birth weight (<2,500 g) of 36.6%, while the tribal of 303 cases whose birth weight risk as much as 59.3%. Statistical test results obtained p value = 0.001, OR = 0.396, i.e., meaning that infants born with the weight does not normally have the chance 0.396 times sufferer of acute respiratory infections compared with infants with normal birth weight. Birth weight is an important indicator of a child’s vulnerability to the risk of childhood illness and chances of survival.

Out of 303 coastal cases 196 (64.6%) were males and out of 300 tribal cases, 176 (58.6%) were females (Fig 2). On the basis of clinical manifestations, the children were found to be associated with Bronchopneumonia 55.8%, severe pneumonia 19.5%, Pneumonia 16.7%, and any ARI 7.8%. Significantly more cases from the tribal facility had fever, 300 (100%) compared with 141 (46.6%) from the coastal facility (p=0.0001). Other characteristics that were common were wheezing 76 (25%) and high pulse rate 61 (20.2%) cases from the tribal site and dyspnoea was reported in 58 (19.2%) from the coastal health facility (as displayed in Table 2).

Majority (66.9%) of the mothers belonged to the age group between nineteen to twenty-four years in tribal region where as in coastal its 49.8%. However, a positive correlation was found between mothers age, child birth weight and occurrence of ARI as well as mothers education and ARI in the coastal region (p<0.001) (Fig.-1).

Overall, 26.56% of ARI cases were prevalent in low social classes (III, IV and V). Male children (60%) were more affected than female children (40%), children below 1 year (69%), overcrowded houses (28.5%) and low birth weight babies (≤2.5 kg) (36.18%). Maximum 64% and 40% of ARI cases were low socioeconomic groups (IV) in tribal and coastal regions respectively and remaining ARI cases were distributed among middle
and upper socioeconomic groups (I, II and III) in both the region. Among 603 cases of ARI, overcrowding was associated in 408 (67.6%), and history of tobacco smokers in family in 335 (55.5%). Occurrence of ARI was 73% in overcrowding families in tribal as compared to the 63% in coastal (p=0.0054). Prevalence of ARI was more among children having an illiterate mother (70%) in comparison to the primarily educated mother (17%) in the tribal region. In contrast to this result, more prevalence of ARI was found among children having primary educated mother (49%) in comparison to the illiterate mother (25%) in the coastal region. The age of the mother and indoor smoking by any family member was also significantly associated with ARI (p<0.001) (Table-1).

**Seasonality of ARI case enrolment:** Month wise patient admission with ARI indicated two peaks in a year one between July-August (34.7%), September-October (21.3%) in coastal region, in tribal’s (22.8%) during August-September in both consecutive years. In brief, most of the specimens were collected (84.3%) between July and February in coastal patients, whereas in tribal region, cases were reported throughout the year with only a single pick between August-September.

**Discussion**

ARI in young children is responsible for 3.9 million deaths worldwide each year. The incidence of pneumonia in developing countries is high due to increased prevalence of malnutrition, low birth weight and indoor air pollution in developing countries [2]. The prevalence of ARI under-five children was reported to be 34.3% in Delhi [5] while 22% in Gujarat [6]. In the present study, the overall prevalence of ARI was 20.9% that is comparable with the study done in Kenya [7], Delhi [8], and Bangladesh [9]. Results from our study suggested that the present rate of ARI was more than the reports of NFHS-3 [10] and much less than the prevalence rate in Delhi, 2011. Prevalence of ARI in Greeneland increased from less than 1 year age and decreased there after [15]. Severe underweight was another predictor of pneumonia; low birth weight has been reported to be associated with the development of pneumonia [11, 12]. Several studies describe an association of cigarette smoking or exposure to environmental tobacco smoke with the occurrence and severity of ARI [13, 14, 15, 16, 26]. Smoking is believed to exacerbate respiratory diseases by harming respiratory defense mechanisms [17]. Living in poor economic conditions are more likely to suffer from acute lower respiratory infections than children living in better-off households. This finding is common around the world [24].

In our study, the pattern of all ARI involves maximum 56.7% Bronchopneumonia, 19% severe pneumonia and 17.2% pneumonia. It has been reported that respiratory diseases contribute 10% of pneumonia in Lucknow [18] and Delhi [20]. Pneumonia among ARI cases was reported to be 4% in Bangladesh [22] that stayed less than the Indian counterpart. This incidence of pneumonia and severe pneumonia is a contrast to the reports available in another part of the country and neighboring country [19].

The present study perhaps the first cross-sectional study investigating the role of risk factors for ARI in the tribal and coastal populations of Odisha. In our study, the most affected age group were below 1 year including Bronchopneumonia, severe pneumonia and pneumonia that declined with increasing age.

Globally, poor living conditions present risk factors for illness and are associated with inadequate utilization of primary health care [23]. The findings of the present study clearly reveals that low-economic status (wealth index) is an indicator of high prevalence (51%) of ARI among under-five children as reported in Gujarat [7]. Our results revealed 64% tribal and 40% coastal ARI cases were among low socioeconomic class under-five children’s. This association of ARI with low socioeconomic factor is significantly associated in both the region. Still, children from poor households face a problem of healthcare utilization [22].

Mother education has a strong positive influence on child survival in most of the developing country [23, 27]. Educated mothers have better knowledge of nutrition, illness of children and treatment. There is direct relationship exists between education and health seeking behaviors. In our study, 73% tribal families with the history of overcrowding had high risk of ARI compared to the families 63% in coastal (p=0.0054, OR=0.613). In addition, we found that the environmental variables, inadequate ventilation (P=0.0417, OR =1.4), exposure to indoor air pollution in form of smoking by any family member (p<0001, OR=0.206) were significant risk factors for ARI.

**Conclusion**

Based on this research can be concluded that the age of children under 1 years, male gender and low birth weight, low-economic status, inadequate ventilation and
indoor air pollution toddlers has a chance to experience acute respiratory infections is greater than the toddlers aged over 1 years, female gender, birth weight normal, adequate ventilation and no indoor air pollution. The tribal’s residing in remote areas got distinct disadvantages for attaining good health as compared to the coastal population of the state. This hospital-based study documents the importance of ARI associated with the infants and provides baseline data to develop preventive methods depending on the risk factors.

**Conflict of Interest:** The authors report no conflict of interest

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Effectiveness of Training on Postural Stability in Mild to Moderate Diabetic Neuropathy Patients

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ABSTRACT

Background and Purpose: Diabetic neuropathy is a well-known micro vascular complication of type 2 diabetes mellitus attributed to chronic hyperglycemia with peripheral nerve dysfunction. Postural instability is the major clinical impairment which leads to increased risk of falls. Therefore this study aims to retrain the postural stability and to reduce risk of falls by means of prescribed exercise training program in mild to moderate diabetic neuropathy patients.

Research Design and Method: This Quasi experimental - pretest/posttest design included 34 subjects who fulfilled inclusion criteria. Outcomes were measured using Clinical neurological examination-Valk score, Tinetti falls efficacy scale, Multi directional reach test and Unipedal stance test. Patients were given a prescribed training program of 3 weeks at home with a regular follow up.

Result: The results showed that there is a significant difference in Clinical neurological evaluation, Falls efficacy scale and unipedal stance time (p<0.000),Multi directional reach forward and right (p<0.000), backward (p<0.001) and left (p<0.002) shows significant changes.

Conclusion: Training postural stability have beneficial effects in improving the unipedal stance time, Multidirectional reach and Falls efficacy scale. Clinical neurological examination score is significant but not highly significant as expected. Training may not have a greater influence and effectiveness in clinical symptoms but beneficial in improving one’s stability limits. Early assessment and training program to be considered to reduce the risk of falls in the disease progression state.

Keywords: Diabetic neuropathy, fall risk, postural stability, training

INTRODUCTION OR BACKGROUND

Diabetic neuropathy is a well-known microvascular complication of type 2 diabetes mellitus attributed to chronic hyperglycemia, and is defined as the presence of peripheral nerve dysfunction in diabetics after exclusion of other causes¹.

The typical diabetic peripheral neuropathy is a chronic, symmetrical, length-dependent sensorimotor polyneuropathy and is thought to be the most common variety. It develops on a background of long-standing hyperglycemia, associated metabolic derangements (increased polyol flux, accumulation of advanced glycation end products, oxidative stress, and lipid alterations among other metabolic abnormalities) and cardiovascular risk factors².

According to the Diabetes Atlas 2012 published by the International Diabetes Federation, the number of diabetes in India is currently around 40.9 million, and is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. It is estimated that 60% to 70% of individuals with diabetes have mild to severe forms of nervous system damage.
The common clinical manifestations include pain, numbness or tingling sensation, distal sensory loss such as pin prick, temperature, proprioception and vibration, distal weakness, foot ulceration, subjective feeling of unsteadiness and history of fall.

Postural instability can be defined as inability of an individual to maintain the position of body, or more specifically the centre of mass within specific boundaries of space referred to as stability limits and in relation to the surrounding environment, in static and dynamic conditions.

Individuals with diabetes and peripheral neuropathy have greater postural sway in quiet standing and greater difficulty in integrating sensory information for balance control than healthy subjects.

Postural instability in diabetic neuropathy may be influenced by factors such as distal sensory loss mainly proprioception and vibration, decreased tactile and thermal sensitivity, impairments such as loss ankle motor function, impaired weight transfers and decreased unipedal stance time, increased whole body reaction time, different onset and cessation of muscle activity and abnormal gait patterns over irregular surfaces which predispose to falls.

Postural instability is greatest when visual or vestibular cues are absent or degraded. Even with vision, the postural stability of diabetic neuropathic patients is impaired when performing more challenging daily tasks. The sensory loss associated with diabetic neuropathy contributes to impaired balance and gait.

Patient with even mild neuropathy and clinically normal ankle strength have a marked impairment in distal motor function characterized by a decrease in ability to develop strength about ankle rapidly.

A fall is often defined as inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects. Many studies shows that, compared to patients with diabetes but no peripheral neuropathy, patients with diabetic peripheral neuropathy are more likely to report an injury during walking or standing, more frequent on irregular surfaces. There is growing evidence that foot and ankle neuropathy leads to difficulty with balance and possibly increases the risk of falling.

Diabetic neuropathy is a true risk factor for falls in the elderly.

The expected functional limitations could be postural instability and falls. Neuropathy may remain undetected, and progress over time leading to serious complications. So, this subclinical impairment needs an early assessment and intervention. But there is lack of definite exercise protocol for treating such diabetic neuropathy with postural instability. An exercise program may be designed to target on the components such as ankle strategy, multi directional reaching, muscle force & strength and rapid reaction strategies.

Only few studies have evaluated treatments, which aimed to improve gait and balance and decrease fall risk. A 2010 update of a Cochrane database systematic review states that there is “lack of high-quality evidence to evaluate the effect of exercise in people with peripheral neuropathy”. And also in a systemic review which says there is (Grade B) fair evidence for clinical recommendation of lower limb exercise for diabetic neuropathy (level of evidence II-1).

The more severe the stage of diabetic polyneuropathy the patients were unable to walk. Hence this study included the patients with mild to moderate forms of diabetic neuropathy.

This study aims to retrain the postural stability and to reduce risk of falls by means of prescribed exercise training program in mild to moderate diabetic neuropathy patient.

**MATERIALS AND METHOD**

This Quasi experimental - pretest/posttest design was conducted in out patient department of Diabetology, Sri Ramachandra hospital using convenient sampling.

Inclusion criteria were patients diagnosed as diabetic neuropathy with Valk score mild to moderate >2-18, Normal standing balance ability to participate, Duration of type 2 diabetes (>5 years), Age 50-75, Both genders, Able to walk household distance without any assistance and Able to understand and obey simple commands.

Patients with other neurological & musculoskeletal disorders & cardiovascular problems,Non-diabetic neuropathy, Presence of plantar ulcer, 4)Signs of vestibular dysfunction, Visual impairment and Medically unstable patients were excluded in the study.
Procedure: The subjects was recruited according to the eligibility criteria. A total of 60 diabetic patients was examined for neuropathy using clinical neurological evaluation (valk score). In which, Sensory components such as light touch, pin prick, vibration sense, proprioception of first toe and motor components such as strength of extensor hallucis longus and gastrocnemius, and ankle jerk was examined. Neuropathy score was given, and patients who fall under >2-18(mild to moderate) score was selected. Out of 60 patients, 39 patients had mild to moderate diabetic neuropathy. Two patients was excluded with the presence of foot ulcer and one was not willing to participate. Informed consent was obtained from the included subjects.

Subjects were assessed initially using following outcome measures.

1. Clinical neurological examination (CNE)- Valk score
2. Tinetti falls efficacy scale (FES)
3. Multi directional reach test (MRT)
4. Unipedal stance time (UPS)

Fear of fall was evaluated & scored by questionnaire method, Multi directional reach test was performed and measured in inches, Unipedal stance test was performed and the time was noted in seconds.

After the initial evaluation, 36 patients were trained for exercise program. The protocol was explained and demonstrated individually to all patients initially, and then group training was given. Initial supervised exercise program was given for 2 sessions. And the patients was advised to follow the protocol at home. Safety measures was also advised. A pamphlet of prescribed exercises was made and given to all the patients and advised to follow the same. Also a month calendar was attached with the pamphlet, a date mark made in the start of session and at the end of 3 weeks. Then the patients was asked to mark over the calendar as they do exercise daily for confirmation. Regular follow up was also made through telephone.

Training Protocol:

1. Wall slides
2. Bipedal (Standing) heel & toe raises
3. Stepping practice (Ankle strategy training)- participants needs to lean, pivoting at their ankles until they need to take protective step(s) to stop themselves from falling (lean forward or backward)
4. Step over 4-square exercise
5. Single leg stance
6. Single leg heel raise – chair assisted
7. Stepping over blocks
8. Resistance exercises
9. Turning 360
10. Reaching forward

Training was prescribed for 3 weeks, everyday 3 sets, 10 repetitions each exercise. Patients were allowed to use their hands for support wherever they need for safety purpose.

After the training program, re assessment was made using the same outcome measures and post test values were recorded.

FINDINGS

This study was a Quasi experimental study design (pre and post test). The paired t-test was used to test the differences. The measures such as clinical neurological evaluation, falls efficacy scale, multi directional reach test and unipedal stance time pre and post test conditions were analyzed for results. P values of <0.05* was considered to be statistically significant. Patients was analyzed for results. The software used for analysis of data was SPSS version 20.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Patient population (N = 34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age -Mean (SD)</td>
<td>62.76 (6.50)</td>
</tr>
<tr>
<td>Male- N (%)</td>
<td>16 (47.1%)</td>
</tr>
<tr>
<td>Female- N (%)</td>
<td>18 (52.9%)</td>
</tr>
<tr>
<td>Duration of Diabetes mellitus- Mean (SD)</td>
<td>13.26 (5.86)</td>
</tr>
</tbody>
</table>

Other variables were analyzed to test pre and post test differences.
Table 2: Comparison of pre and post test values of all the measures

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre-test Mean (SD)</th>
<th>Post-test Mean (SD)</th>
<th>Paired differences Mean (SD)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNE</td>
<td>12.24 (3.18)</td>
<td>11.82 (3.31)</td>
<td>0.41 (0.85)</td>
<td>.008*</td>
</tr>
<tr>
<td>FES</td>
<td>57.74 (11.55)</td>
<td>54.00 (12.54)</td>
<td>3.73 (5.51)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>MRT Forward</td>
<td>6.65 (1.31)</td>
<td>7.45 (1.66)</td>
<td>-0.80 (0.78)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>MRT Backward</td>
<td>4.70 (1.01)</td>
<td>5.19 (0.92)</td>
<td>-0.49 (0.78)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>MRT Right</td>
<td>5.08 (1.22)</td>
<td>5.45 (1.06)</td>
<td>-0.36 (0.54)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>MRT Left</td>
<td>5.04 (1.12)</td>
<td>5.35 (1.01)</td>
<td>-0.31 (0.54)</td>
<td>.002*</td>
</tr>
<tr>
<td>UPS Eyes open</td>
<td>7.59 (3.13)</td>
<td>9.82 (3.50)</td>
<td>-2.23 (1.65)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>UPS Eyes closed</td>
<td>1.29 (1.48)</td>
<td>2.41 (1.90)</td>
<td>-1.11 (1.09)</td>
<td>&lt;0.01*</td>
</tr>
</tbody>
</table>

Paired t test, N=34  *Significant P<0.05

CNE-Clinical neurological evaluation, FES - Falls efficacy scale, MRT - Multidirectional reach test, UPS - Unipedal stance time ( EO- Eyes open, EC- Eyes closed)

Clinical Neurological Examination (CNE): Clinical neurological examination included following components such as pin prick and light touch sense(cotton wool), strength of extensor hallucis, gastrocnemius and ankle jerk. There is no such significant improvement as expected in the total score of neuropathy following a training program.

In Length-dependent diabetic polyneuropathy LDDP, more than 80% of patients with clinical diabetic neuropathy does not show any trend towards improvement may require a longer duration of therapy to show any improvements especially sensory deficits13.

These evidences could be the reason for the lack of expected significant improvements in clinical symptoms in this short duration study.

Postural Instability And Multi Directional Reach: Ankle strategy, multidirectional reach, muscle force & strength and rapid reaction strategies play an important role in postural stability. Hence the training program was designed to target these components.

According to the results, there was a significant positive impact of training program on improving functional balance.

Ankle strategy training had enhanced muscle strength of foot and ankle and thereby enhancing the patients ability to balance. It also increased the rapidly available torque in the ankle14 and it recruits type II motor units.

Decreased ankle strength will impair balance recovery, which has been prospectively identified as a risk factor for falls15. Training was also focused on retraining ankle strength, which showed significant improvement.

Reaching activities will improve dynamic stability16. Some studies says that there is lack of stability in anteroposterior direction which might be due to weakness of the leg and back muscles, primarily controlling balance strategies during movement. Based this background, this study focused training antero-posterior stability using ankle, hip strategies. Of all the scores obtained in multidirectional reach, there was a greater improvement in forward reach and right side reach.

Unipedal Stance time test: Significant improvements in unipedal stance time were found with both eyes open and closed conditions. In this study unipedal stance exercise with eyes open and closed with hands support were also trained.

In diabetic neuropathy there will be decreased unipedal stance time10 due to reduced plantar sensation, reduced proprioception and unequal weight transfers. The severity of these components might increase with reduced vision17.

Unequal weight transfers between right and left lower extremities will contribute to increased risk of falls18. Unipedal standing will improve proprioception and equal weight transfers. So, In the training protocol unipedal stance exercises were included.

Falls Efficacy Scale: Fear of fall is a common subjective feeling in diabetic neuropathy. Results shows a greater reduction in fear of falls.
There is a strong association between falls/loss of balance and decreased ankle strength. So any postural training program will improve muscle force and associated function.

This training program improved the subjective confidence towards fear of fall and reduced the risk of fall.

CONCLUSION

The study analysis concludes that training postural stability in mild to moderate diabetic neuropathy patients had beneficial effects in improving the unipedal stance time and Multidirectional reach and in reducing risk of Falls. Clinical neurological examination score was significant but not highly significant as expected. Training may not have a greater influence and effectiveness in reducing other clinical symptoms. Exercise training is beneficial in improving one’s stability limits which reduces the risk of falls. Early assessment and training program should be considered in diabetic neuropathy to reduce the risk of falls in the disease progression state.

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Ethical Clearance: Enclosed below

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Baseline Wander Removal from ECG Using Multiband Structured Sub band Adaptive Filter LMS Algorithm

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ABSTRACT

This paper investigates the new detailed adaptive noise canceller (ANC) system for Electrocardiogram (ECG) enhancement with robustness based on multiband structured sub band adaptive filter (MSAF). The proposed design is probably a new realization form of algorithm which guaranteed a more stable transformation and solves the structured problems in conventional sub band adaptive filter (SAF). The objective of the examination is to give arrangement keeping in mind the end goal to improve the execution of ANC as far as filter parameters which are procured with the assistance of uniform filter banks (UFB) and non uniform filter banks (NUFB) structured MSAF’s using LMS algorithm. Computer simulation demonstrates that the proposed system gives improved performance and achieves good adaptation. NUFB structured MSAF algorithms are applied on ECG records obtained from standard MIT-BIH data base and the performance is compared with UFB structured MSAF algorithms in terms of parameters SNR, MSE, RMSE and distortion. The SNR for various NUFB structured MSAF’s was found to be higher than the UFB structured MSAF’s. The five channel NUFB structures with decimation factors (16,16,8,4,2) has on average SNR of 17.67064 dB is obtained using LMS algorithm which is superior to existing algorithms.

Keywords: ANC, ECG, MSAF, SAF, UFB, NUFB, LMS

BACKGROUND

The Electrocardiogram (ECG) record is a procedural electrical activity of the heart which is noninvasive recording and is acquired by surface electrodes at designated locations on the skin of patient’s body. The ECG is a bioelectric signal, which statistics the electrical pastime of coronary heart as opposed to time. Therefore, it is a vital diagnostic device for assessing coronary heart function. Usually the band of the graphical record signal is 0.05 to 100 Hz. In order to investigate the ECG record of the patient in real-time, there is a chance that the ECG may be corrupted with noise. The main noise(artifact) available in the ECG contains: power-line interference (PLI), baseline wander (BW), muscle artifacts (MA) and motion artifacts (EM), that are generated by patient breathing, movement, power line interference, bad electrodes and improper electrode position. In these artifacts Baseline wander is a low frequency artifact in the ECG that arises from breathing, electrically charged electrodes, or subject movement and can hinder the detection of these ST changes because of the varying electrical isoline.. The observation of those changes becomes difficult if the ECG baseline is not constant. BW is extraneous and strongly influences the ST section, degrades the sign first-rate, frequency resolution, produces huge amplitude indicators in ECG that can resemble PQRST waveforms and mask tiny capabilities which might be important for clinical tracking and diagnosis. Hence, baseline drift must be removed using a standard signal processing algorithms. Most types of artifacts which affect ECG record are eliminated by band pass filters which may not give good result. To enhance the accuracy and reliability for refine diagnosis the artifacts in ECG need to be decreased. Many methods have been implemented to eliminate the noise from noise contaminated ECG using static filters. To overcome the restrictions of static filters, various Adaptive filtering methods have been developed.¹²

Fig. 1 defines the essential downside and noise cancelling answer. A signal s(n) is communicated over a channel to a detector that also collects a interference n₁(n) unrelated with the signal. The first input to the ANC

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is noise contaminated signal \( d(n) \) i.e. \( s(n) + n_1(n) \). The second detector accepts a noise signal \( n_2(n) \) unrelated with the reference input to the ANC that is filtered to produce the estimate signal \( y(n) \) that’s a detailed duplicate of reference input. The output signal \( y(n) \) is subtracted from signal \( d(n) \) to produce the error signal as shown in equation (1). This adaptive filter can be realized using various structures; the most frequently used structure is transversal finite impulse response (FIR).

\[
e(n) = d(n) - y(n) \quad \text{ ...(1)}
\]

**Fig. 1: Block diagram of Adaptive Noise Canceller**

Traditional filters such as adaptive filters\(^3\), sign based normalised adaptive filters\(^4\) were proposed in the literature to minimise artifacts. Different methodologies for ECG denoising include new variable step size NLMS\(^5\) and EEMD-BLMS methods\(^6\). Promising performance are acquired by non linear adaptive algorithms\(^7\), recently hybrid techniques have been proposed to eliminate noise from ECG signals using cascaded adaptive filters\(^8\). Filter banks (FB) decompose a digital signal into different frequency bands. Different methods of decomposing signals in to sub bands have become prominent and were proposed in the literature\(^10, 11, 12, 13\).

Sub band adaptive filter (SAF) structures have been proposed to overcome these problems of adaptive filters. Recently different noise cancellation methods are proposed using SAFs include variable step size sign SAF\(^14\), Variable individual step size SAF\(^15\), New normalised SAF\(^16\). An optimised cosine modulated NUFB design approach has been proposed by Kumar,A.,G K Singh et., al\(^17\). To solve these structured problems a multiband structured SAF (MSAF) are developed in which the full band adaptive filter’s tap weight vectors are updated by a single adaptive algorithm using sub band signal\(^11, 18\). The non-uniform filter bank SAF (NUFBSAF) is developed to achieve a better convergence performance by adapting the band width of analysis filters through proper selection of decimation factors. The objective of this paper is to develop non uniform multi band structured sub band adaptive filter which can improve the performance of the traditional ANC system, to analyse the application of SAF to noise cancellation problem in ECG.

**PROPOSED DESIGN**

A general objective is to create one arrangement of preprocessing filters which is useful in a noise cancellation tasks for ECG signal. The concept of multiband structured-sub band adaptive filter (MSAF) is presented in this section. In the proposed design the noise contaminated ECG record i.e primary input signal denoted as \( d(n) \) given to the upper FB in Figure.2. Secondary (reference) signal is given to SAF (lower FB with adaptive filter) is noise signal \( n_2(n) \) denoted as \( u(n) \).

The full band input signal \( u(n) \), primary input signal or desired response signal \( d(n) \) and filter output signal \( y(n) \) are decomposed into \( N \) sub bands by means of analysis filters \( H_i(z) \); for \( i=0,1,2...(N-1) \). In this Fig.2 \( H_0, H_1, H_2,...., H_{N-1} \) and \( F_0, F_1, F_2,....F_{N-1} \) are analysis & synthesis filters of \( N \) channel perfect reconstruction (PR) filter bank respectively. These sub band signals are decimated to a lower rate using same factor and are processed by individual sub band adaptive sub filters \( W(z) \)^\(^{11}\).

**Fig. 2: Block diagram of a multiband structured sub band adaptive filter (adapted from Reference [11])**
Non uniform filter banks have non uniform frequency partition. One method of building NUFB is to cascade UFB in a tree structure using a two channel FB as basic building blocks. As an example of this method, NUFB with decimation factors (16,16,8,4,2) is illustrated. The proposed tree-structured non uniform filter bank’s analysis section is shown in Figure.3.

![Fig. 3: Proposed block diagram of a tree structured NUFB](image)

The proposed structure make use of low pass FIR prototype Parks-McClellan optimal equiripple filter design in both analysis and synthesis FB that give near perfect reconstruction by permitting little measure of distortion at the output. The generalized structure of N-channel NUFB based on tree structured approach having decimation N_0, N_1, N_2, ..., N_{N-1} for each band then the decimation factors must fulfill the accompanying condition_12_.

\[ \sum_{k=0}^{N-1} \frac{1}{N_k} = 1 \] ...
(2)

In N-channel NUFB the PR is possible if

\[ \sum_{k=0}^{N-1} |H_k(e^{jw})|^2 = 1 \text{ for } 0 \leq w \leq \frac{\pi}{N} \] ...
(3)

Where \( H_k(e^{jw}) \) is frequency response of \( k \) th filter in equivalent NUFB parallel form

For tree structured NUFB design having decimation factors (16,16,8,4,2) the PR condition can be achieved by using following equation

\[ |H_0(e^{jw})|^2 + |H_2(e^{jw})|^2 + |H_4(e^{jw})|^2 = 1 \text{ for } 0 \leq w \leq \frac{\pi}{5} \] ...
(4)

Here \( H_0(z), H_2(z), H_4(z) \) analysis filters with the following relations_12_.

\[ H_0(z) = H_{11}(z) \quad H_2(z) = H_{21}(z) \quad H_4(z) = H_{41}(z) \] ...
(5)

\[ H_1(z) = H_{11}(z) \quad H_3(z) = H_{21}(z^2) \quad H_5(z) = H_{41}(z^2) \] ...
(6)

\[ H_2(z) = H_{11}(z) \quad H_4(z) = H_{21}(z) \quad H_6(z) = H_{41}(z^2) \] ...
(7)

Where \( H_{11}, H_{21}, H_{31}, H_{41} \) are low pass filters in the first, second, third and fourth stages respectively and \( H_{12}, H_{22}, H_{32}, H_{42} \) are high pass filters in the first, second, third and fourth stages respectively.

**Proposed NUFB-MSAF algorithm:** The traditional ANC shown in Figure.1 incorporates filter whose input parameters are \( d(n) \) and \( u(n) \). Here \( u(n) \) is the time delayed input vector values, \( u(n) = [u(n), u(n-1), u(n-2), \ldots, u(n-M+1)] \). The vector \( w(n) = [w_0(n), w_1(n), w_2(n), \ldots, w_{M-1}(n)] \) represents the coefficients of the filter at time index \( n \). The \( N \) sub band signals of MSAF algorithms require particular computational steps in every emphasis as takes after_11_.

It is important to note that \( n \) refers to the time index of original sequence and \( k \) denotes the time index of decimated signal.

**Summary**

For \( s = 1, 2, \ldots, N \) where \( s \) is stages

Analysis filters \( H_i(z) \)

for \( i = 0, 1, 2, \ldots, N-1 \)

\[ H(z) = H_{s,j}(z^s), H(z^s), H(z^s) \ldots, H_{s,j}(z^s) \]

\[ H_{s,j}(z) = H_{s,j}(z^s), H(z^s), H(z^s) \ldots, H_{s,j}(z^s) \]

For \( k = 0, 1, 2, \ldots, kN \) where \( kN = n \)
Error estimation:
\[ e_D(k) = d(k) - U^T(k)w(k) \]

Normalization matrix:
\[ \Lambda(k) = \text{diag}[U^T(k)U(k) + \alpha] \]

Tap-weight adaptation:
\[ w(k+1) = w(k) + \mu U(k)\Lambda^{-1}(k)e_D(k) \]

Input signal Band partitioning:
\[ U_1^T(k) = H^T A(kN) \]

Desired signal Band partitioning:
\[ d_D(k) = H^T A(kN) \]

Synthesis:
\[ e(kN) = Fe_D(k) \]

Parameters:
- \( l \& h \) - Basic Low pass filter & high pass filter notation
- \( M \) - Number of adaptive tap weights
- \( N \) - Number of sub bands
- \( L \) - Length of the analysis and synthesis filters

Variables:
\[ U^T(k) = [U_1^T(k), U_2^T(k-1)] \]
\[ U_2^T(k-1) \text{ - first } M-N \text{ columns of } U^T(k-1) \]
\[ A(kN) = [a(kN), a(kN-1), a(kN-2), \ldots, a(kN-N-1)] \]
\[ a(kN) = [u(kN), u(kN-1), u(kN-2), \ldots, u(kN-L-1)]^T. \]
\[ d(kN) = [d(kN), d(kN-1), d(kN-2), \ldots, d(kN-L-1)]^T. \]

MSAF using LMS Algorithm
\[ w(k+1) = w(k) + \mu \left\| e_D(k) \right\| + \alpha U(k) \]

Where \( \mu \) is learning rate parameter and it should be selected in the stability bound i.e. \( 0 < \mu < \frac{2}{N \cdot P_u} \), here \( P_u \) is average power of the reference signal \( u(n) \) calculated as \( P_u = u^T(n)u(n) \). And \( \alpha \) is a small positive constant used to avoid possible division by zero.

RESULTS AND DISCUSSION

In this simulation the benchmark Massachusetts Institute of Technology-Beth Israel Hospital (MIT-BIH) arrhythmia database \(^{19,20}\) ‘mat’ file recordings (100m, 105m, 108m, 203m and 228m) were used to test the execution of various UFB & NUFB structured MSAF’s adaptive algorithms for ECG denoising. The recordings were sampled at 360 samples per second per channel with 11-bit resolution over a 10 mV range. The simulations were done by collecting 3600 samples of ECG recordings. In this simulation the proposed methodology has been implemented using Parks-McClellan optimal equiripple linear phase (real, symmetric coefficients) low pass FIR filter design with length 32, cut off frequency 50 Hz and sampling frequency 360 Hz. The secondary noise signal \( n_2(n) \) shown in Figure 1 is taken from noise generator. In order to test the filtering capability in non-stationary environment artificial BW with 2 mv amplitude and 3600 samples were simulated for BW cancellation. The proposed UFB and NUFB structured MSAF-ANC are compared quantitatively by quality assessment parameters Signal-to-Noise Ratio Before Filtering (SNRBF) and Signal-to-Noise Ratio After Filtering (SNRAF) are

\[ \text{SNRBF} = 10 \log_{10} \frac{\sum_{n=0}^{N-1} [S(n)]^2}{\sum_{n=0}^{N-1} [d(n) - s(n)]^2} \]
\[ \text{SNRAF} = 10 \log_{10} \frac{\sum_{n=0}^{N-1} [S(n)]^2}{\sum_{n=0}^{N-1} [e(n) - s(n)]^2} \]

Baseline Wander Cancellation using MSAF-LMS algorithm: In this proposed design 3600 samples of clean ECG signal records from MIT-BIH database which are corrupted with BW noise with frequency 0.5 Hz and the sampling frequency of 360Hz is applied as primary input signal to the ANC shown in Figure 1. The following figures 5-6 show the BW Noise elimination. The NUFB structured MSAF’s achieve good SNR; MSE and RMSE values over UFB structured MSAF’s adaptive algorithms. Table 2 presents ‘quantitative parameter values for five record numbers from MIT-BIH data base. The simulation results state that NUFB structured MSAF’s adaptive algorithms has greater efficiency than UFB structured MSAF’s adaptive algorithms. These results for MIT-BIH data base record number 105 are shown in Figures 5-6.
<table>
<thead>
<tr>
<th>SNR Values</th>
<th>100</th>
<th>105</th>
<th>108</th>
<th>203</th>
<th>228</th>
<th>Avg.Val</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Filtering</td>
<td>5.8196</td>
<td>3.6498</td>
<td>8.6812</td>
<td>2.3261</td>
<td>9.0842</td>
<td>5.91218</td>
</tr>
<tr>
<td>Three Channel(3,3,3)UFB</td>
<td>7.2025</td>
<td>5.1324</td>
<td>9.8104</td>
<td>3.9673</td>
<td>10.3547</td>
<td>7.29346</td>
</tr>
<tr>
<td>Four Channel(4,4,4,4)UFB</td>
<td>6.4965</td>
<td>4.73</td>
<td>9.3459</td>
<td>3.8286</td>
<td>9.6962</td>
<td>6.81944</td>
</tr>
<tr>
<td>Five Channel(5,5,5,5)UFB</td>
<td>6.9084</td>
<td>4.8398</td>
<td>9.6409</td>
<td>3.959</td>
<td>10.1547</td>
<td>7.10056</td>
</tr>
<tr>
<td>Four Channel(8,8,4,2)NUFB</td>
<td>11.5227</td>
<td>9.894</td>
<td>14.3367</td>
<td>9.1023</td>
<td>14.7329</td>
<td>11.93572</td>
</tr>
</tbody>
</table>

The performance of UFB structured MSAF’s and NUFB structured MSAF’s using LMS algorithms in terms of SNR are shown in Table.2. The simulation results state that NUFB structured MSAF algorithms has greater efficiency than UFB structured MSAF algorithms. As shown in Table.1 three channels UFB has on average SNR of 7.29346 dB for 5 records and three channels NUFB has on average SNR of 9.37192 dB. Similarly for four channel UFB has on average SNR of 6.81944 dB for 5 records and four channels NUFB has on average SNR is 11.93572dB, for five channel UFB has on average SNR is 7.10056dB for 5 records and five channel NUFB has on average SNR is 17.67064 dB. It is clear from Table.1 that NUFB structured MSAF’s adaptive algorithms outperform UFB structured MSAF algorithms in approximating the ECG noises. The peak reconstruction error (PRE) is reduced appreciably. The average PRE obtained for three channel, four channel and five channel UFB’s are 0.08169 dB, 0.0414 dB and 0.0454 dB respectively. The average PRE obtained for three channel, four channel and five channel NUFB’s are 0.03583 dB, 0.0238393 dB and 0.0288 dB respectively.

**CONCLUSIONS**

This research paper presents the new comprehensive ANC system of ECG signals with robustness based on UFB &NUFB structured MSAF’s using LMS algorithm. The proposed model is potentially a new realization structure form of ANC which guaranteed a more stable transformation in response to variants in input signal power. The theoretical analysis of NUFB structured MSAF system is carried out and simulations are performed using MATLAB. In order to analyze the performance of the proposed design a comparison has been made between six different ECG denoising schemes i.e three channel, four channel and five channel UFB & NUFB structured MSAFs using LMS algorithm. Better filtering performance results are obtained by NUFB structured MSAF using LMS algorithm and also this algorithm guarantee the better estimation of noise. Computer simulation demonstrated that the proposed system gives improved performance and achieves good adaptation. The SNR for various NUFB structured MSAF’s was found to be higher than the UFB structured MSAF’s. The NUFB structured MSAF’s using LMS algorithm performs better SNR values than UFB structured MSAF using LMS algorithms.

**Source of Funding:** Self

**Ethical Clearance:** Taken from the department chair of UNIVERSITY COLLEGE OF ENGINEERING & TECHNOLOGY, ACHARYA NAGARJUNA UNIVERSITY and DDC members to publish this work. No Conflict of Interest.

**REFERENCES**


“Are the Maternity Nurses Knowledgeable on Oxytocin Induction During Labour? A Protocol Development for Hospitals in South India”

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Abstract

We conducted this study among 100 nurses who were working in the maternity ward of Hosahalli referral Hospital, and Sagar hospital in Bangalore, India, by using non-probability purposive sampling technique. The data was collected by using self-administered questionnaire. The study revealed that there is a significant relationship between knowledge level of respondents and their experience in the procedure of oxytocin induction as evidenced by P value 0.0422< alpha value 0.05. The test is Statistically Significant at 95% confidence level. Area wise analysis of knowledge score of staff nurses regarding oxytocin induction of labour has made the impression in five areas (1) the knowledge score of the samples about information of induction of labour were 70%. (2) General information about oxytocin induction (64.57%). (3) Information related to indications and contra indications of oxytocin induction (65%). (4) Information about induction of oxytocin (68.53%). (5) Nursing management during oxytocin induction (66.14%).The overall knowledge score of the participants (100 samples) is (65.50%), overall mean (28.82), median (23) SD (20.32) which revealed that only 31% of the participants have adequate knowledge on oxytocin induction during labour. A new protocol was developed for the maternity nurses on the oxytocin induction, based on the statistical findings of self-administered questionnaire for the two hospitals where the study was conducted.

Keywords: Knowledge, Staff nurses, Oxytocin Induction, Protocol

Introduction

Ensuring safe childbirth is the responsibility of a maternity nurse by promoting and preserving the health of the mother and foetus from conception to childbirth. To ensure safe delivery, various measures have been used when needed to induce labour ¹ namely, medical induction and surgical induction. Medical induction is administration of oxytocin drug intravenously which is more commonly used during the first stage of labour for the purpose of progression of labour process².

The use of oxytocin for induction of labour has been studied in the United States since 1993.³ This method is effective for cervical ripening and has relatively few adverse effects. Patients will often progress to spontaneous labour in eight to 12 hours. At the same time health care professionals should bear in mind the serious adverse reaction of oxytocin drugs if they are misused ⁴. Nurses often must assess the safety of mother and foetus during an oxytocin induction without a protocol based on research findings. The perinatal team can develop
strategies to minimize risk of maternal-foetal injuries related to oxytocin administration consistent with safe care practices used with other high-alert medications.\(^5\)

An incidental study was done among 75 mothers in Mumbai on oxytocin for ripening of cervix in induction of labour and most of them had a ripped cervix. Majority (92\%) of the patients went into spontaneous labour and 8\% required re-instillation and the study has shown that the proper and safe administration of oxytocin can produce active result but the staff nurse should have through knowledge on the induction.\(^6\) Initiation of induction or augmentation of labour with oxytocin is the responsibility of primary health care providers, although the medication is often administered by a nurse. A written protocol for the preparation administration of oxytocin should be established by the obstetrics department in each institution.\(^7\)

A Randomized Control Trial on concurrent oxytocin with a sustained-release dinoprostone vaginal insert for labour induction at term to determine whether the concurrent administration of oxytocin with sustained-release dinoprostone resulted in shorter induction times when compared with oxytocin after the removal of the dinoprostone insert. The proportion of deliveries within 24 hours was higher (90\% vs 53\% \(P = .002\)) in the immediate group.\(^8\)

Lack of protocols in the hospitals, lack of knowledge about administration of oxytocin drugs, its monitoring and serious adverse reactions and inadequate provision for in-service education for the technically qualified nurse lead to improper oxytocin administration.\(^9\)

Oxytocin induction protocol can also be useful in securing the maternal and foetal well-being, prevention of maternal and foetal complications, ensuring safe delivery and to safeguard the nursing personnel.\(^10\)

Objectives

1. To assess the level of knowledge of staff nurses in maternity ward on oxytocin induction during labour.
2. To find out the association between selected demographic variables of staff nurses working in maternity ward with their knowledge level regarding oxytocin induction
3. To develop a protocol for staff nurses regarding oxytocin induction during labour.

Materials and method

Research design: Descriptive research design was used.

Research approach: Survey approach, using self-administrated questionnaire.

Research setting: The setting of the study was 150 bedded Hosahalli referral hospital and 400 bedded Sagar Hospital in Bangalore.

Independent and dependent variable: Oxytocin induction knowledge level of staff nurses on oxytocin induction.

Extraneous variable: Age of the staff nurses, gender, religion, education, type of family, marital status, family income, year of experience in maternity ward, number of performance of oxytocin induction, designation, previous seminars attended, and source of information etc.

Study population: Staff nurses who are working in maternity ward. The Assessable population are staff nurses who are working in the maternity ward of Hosahalli referral Hospital, and Sagar hospital in Bangalore.

Sample size: The sample size of the study consists of 100 staff nurses who are working selected hospitals

Sampling technique: Non-probability purposive sampling

Sampling criteria

Inclusion criteria

1. Staff nurses who are working in maternity ward.
2. Staff nurses who are willing to participate in the study.
3. Staff nurses who are available at the time of study.
4. Staff nurse who can read and write English.

Exclusion criteria

1. Staff nurse working in maternity ward who are not ready to consent in the study.
2. Staff nurses working in maternity ward that are not available during study period.
3. Staff nurses who had the qualification of ANM or multipurpose workers.

Tool for data collection: Self-administered questionnaire was used to assess the knowledge of staff nurses on oxytocin induction during labour. Content validity was done by 10 experts in obstetrics and gynaecology and one statistician. Internal consistency was assessed by using split half with row score and deviation method and spearman brown prophesy formula. The reliability of the tool was found to be 0.9.

Data collection process: The study data collection was done from 1\(^{st}\) October 2016 to 30\(^{th}\) of October 2017. The total sample of the main study consists of 100 staff nurses those who working in maternity ward. Data
was collected from the sample by administering self-administered questionnaire, after obtaining consent from the participants. per day 10 samples (5 in the morning and 5 in the afternoon) were assessed from the both hospitals. 30 staff nurses from Hosahalli referral hospital, and 70 staff nurses from Sagar hospital were assessed the knowledge on oxytocin induction by SAQ.

Figure 1 depicts the source of information for nurses about oxytocin induction which shows 49% of nurses gained information about oxytocin induction through in-service education (49%) followed by academic education (39%). Mass media and colleagues were the least information sources (6%) for nurse about oxytocin induction.

Table 1: Level of knowledge percentage of scores among the participants

<table>
<thead>
<tr>
<th>Knowledge level</th>
<th>Score</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Adequate (11-20)</td>
<td></td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Moderate (21-30)</td>
<td></td>
<td>51%-70%</td>
</tr>
<tr>
<td>Adequate (31-44)</td>
<td></td>
<td>&gt;71%</td>
</tr>
</tbody>
</table>

Level of knowledge percentage of scores among the participants that reveals the participants were having inadequate knowledge regarding oxytocin induction belongs to the score 11-20 (>50%). Moderate knowledge score is 21-30 (51%-70%). Adequate knowledge score is 31-44 (70%).

Table 2: Association between knowledge of nurses about oxytocin induction and their experience in administration of oxytocin injection intravenously during delivery

<table>
<thead>
<tr>
<th>Monthly income</th>
<th>Sample</th>
<th>Knowledge Level of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inadequate (&lt;50%) Score less than 20</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Below 5 years</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>6 to 10 years</td>
<td>63</td>
<td>15.0</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>18</td>
<td>5.0</td>
</tr>
<tr>
<td>More than 16 years</td>
<td>14</td>
<td>20.0</td>
</tr>
</tbody>
</table>

There is a significant relationship between knowledge level of respondents and their experience in the procedure of oxytocin induction as evidenced by P value 0.0422 < alpha value 0.05. The test is Statistically Significant at 95% confidence level. There was no association between knowledge and other demographic details of subjects participated in the study.

Out of 44 questions, 4 questions are information related to induction of labor, the knowledge score of the samples were 70%, the second session consists of general information about oxytocin induction, the samples knowledge score were 64.57%. Third session contains the information related to indications and contra indications of oxytocin induction, the knowledge score of the samples were 65%. Fourth session includes the information about induction of oxytocin, the knowledge score of the staff was 68.53%. Fifth session consists of nursing management during oxytocin induction. Knowledge score of the participants were 66.14%. The overall knowledge score of the participants was 65.50%, overall mean 28.82, median 23, SD 20.32, which reveals that the participants got moderate knowledge on oxytocin induction during labour.
Figure 2: Overall knowledge score of participants on oxytocin (OXT) induction

Overall knowledge score of participants on OXT induction which Shows that (20%) participants having inadequate knowledge on oxytocin induction, (49%) were having moderate knowledge and the remaining (31%) were having adequate knowledge about oxytocin induction during delivery of pregnant women.

Table 3: Content of the developed protocol of oxytocin induction

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Content of Oxytocin induction protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Purpose</td>
</tr>
<tr>
<td>2.</td>
<td>Policy</td>
</tr>
<tr>
<td>3.</td>
<td>Indication</td>
</tr>
<tr>
<td>4.</td>
<td>Contra-indication</td>
</tr>
<tr>
<td>5.</td>
<td>Pre-oxytocin induction check list</td>
</tr>
<tr>
<td>6.</td>
<td>Equipment</td>
</tr>
<tr>
<td>7.</td>
<td>Procedure</td>
</tr>
<tr>
<td>8.</td>
<td>Oxytocin infusion rate guide</td>
</tr>
<tr>
<td>9.</td>
<td>Management of complications of cervical ripening</td>
</tr>
<tr>
<td>10.</td>
<td>Management of complications of labour induction in a patient pre-caesarean</td>
</tr>
<tr>
<td>11.</td>
<td>Management of administration of medicine-Induction methodology</td>
</tr>
<tr>
<td>12.</td>
<td>Monitoring during labour</td>
</tr>
<tr>
<td>13.</td>
<td>Documentation</td>
</tr>
</tbody>
</table>

Discussion

Majority 51(51%) were 21-30 years age group, 29 (29%) were 31-40 years of age, 14 (14%) were 41-50 years of age, 6(6%) were 50-58 years of age. Majority of samples were 73 (73%) qualified with diploma in nursing, 10 (10%) were B.Sc. nursing, 12 (12%) were post B.Sc. nursing, and the remaining 5 (5%) were M.Sc. nursing.

A pre experimental design was conducted at ESI Hospital, Bangalore among 60 samples, using non-probability convenient sampling technique, to assess the effectiveness of self-instructional module on knowledge regarding maternal and neonatal outcome of induction of labour among staff nurses structured questionnaire was used. Majority of staff nurses attained were 31-35 years age (37%) had GNM education (83%). About 39% of subjects had above 6 years experiences.

Majority 59 (59%) have done nursing training from private institutions, 38 (38%) were from Government institutions, 3 (3%) were done from the military institution. This inference was supported by Malek-Khosravi.S in her study out of 30 subjects 26(43.33%) of the subjects were done nursing training from private institution.

Majority of samples 53 (53%) were having an experience of below 5 years, 23 (23%) were having an experience of 6-10 years, 18 (18%) were having an experience of 11-15 years, and the remaining 6 (6%) were having more than 16 years’ experience in the maternity ward.

Majority 97 (97%) of the staff nurses got the chance of administering the oxytocin in their carrier, remaining 3 (3%) were not done the oxytocin administration procedure in their carrier.

This study is supported by Rajatee.M and Rezaee.M, shows that among the total sample 13 (40%) of the subject performed oxytocin induction more than 10 times during their working experience in the maternity ward.

Almost half 49 (49%) of the staff nurses got information from in service education, 39 (39%) were got OXT information from the academic education, 6 (6%) were got through mass media and the remaining 6 (6%) were got it from friends and colleagues.

Knowledge score of participants on OXT induction reveals that the mean knowledge score obtained by the participants were 28.82, median were 23 and the SD were 20.32, the mean percentage of the participants were 65.50%, which was supported by a study conducted in Vellore.
Government Hospital, on knowledge of staff nurses on oxytocin induction that showed overall mean percentage was 60.20% with the mean 20, median 19.8 and SD.

Result of our study showed that there was a significant relationship between knowledge level of respondents and their experience in the procedure of oxytocin induction as evidenced by P value 0.0422< alpha value 0.05. The test is Statistically Significant at 95% confidence level.

The above findings are supported by a study conducted in Tamilnadu, South India, which found that there was an association between some of the demographic variables like age, designation, experience in the obstetric department, with the knowledge level of the nurses, and no association with the marital status and monthly income.

Area Wise Analysis of Knowledge score of staff nurse regarding Oxytocin induction during Labour with the help of mean, median and standard deviation.

The present study reveals that out of 44 questions the 4 questions belong to information related to induction of labor, the knowledge score of the samples were 70%, the second part of the knowledge question belongs to general information on oxytocin induction, there were 7 questions and the samples knowledge score were 64.57%. Third part of the knowledge area belong to indications and contra indications of oxytocin induction, there were 4 questions and the knowledge score of the samples were 65%. Next part include induction of oxytocin, there were 13 questions, and the knowledge score of the staff was 68.53%. Next part consists of nursing management during oxytocin induction, there were 7 questions, the knowledge score of the participants were 66.14%. The overall knowledge score of the participants (100 samples) is 65.50%, Mean 28.82, median 23, SD 20.32, which reveals that the participants have moderate knowledge on oxytocin induction during labour.

The findings of the study supported by a study conducted in Vellore Government Hospital to assess the level of knowledge of staff nurses regarding oxytocin induction in which there was an association between some of the demographic data like age, designation, experience in the obstetric department, with the knowledge level of the nurses, and found that only 2.6% had inadequate knowledge, 52.7% had moderate knowledge and 47.7% had adequate knowledge on labor induction.

Conclusion

In order to ensure safe practices of performing oxytocin induction during labour, we prepared a protocol on oxytocin induction and its management on the basis of significant results of self-administered questionnaire and criteria rating scale that showed that the staff nurses had moderate knowledge on oxytocin induction during labour. We distributed the protocol to the selected maternity ward of hospitals for the better understanding of the oxytocin induction during labour, thus by reducing complications of improper knowledge and practice of oxytocin induction.

Conflict of Interest: None declared.

Source of Funding: Nil

Ethical Clearance: Ethical clearance was taken from the Institutional Ethics Committee, Sri Lakshmi College of Nursing, Bengaluru.

References


A Comparative Study of Effectiveness of Psychological Intervention on Menstrual Distress among College Students

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ABSTRACT
A Package of relaxation, systematic desensitization and an education program was developed and evaluated to determine its efficacy in decreasing the severity of Menstrual Distress. This study had involved both pretest and posttest as well a control group was also used to compare with. But still it’s not purely an experimental design as there is no randomization. It is a quasi-experimental design. Seventy unmarried undergraduate college students were taken for the study. Extraneous variables such as age, family, monthly income, and health status were methodologically controlled. Moos Menstrual Distress Questionnaire, Spielberger’s State and Trait Anxiety Inventory were administered. Among the sample, thirty five comprise the experimental group who were given the package of psychological intervention with grape juice and the other thirty five remained the control group to whom only grape juice was given without psychological intervention. The statistical analysis of the data was carried out with the paired t test technique to reveal significant positive impact of the intervention on the alleviation of menstrual distress which is seen in the group to whom the intervention was given and not in the other group. No significant differences were found in the control group on pretest and posttest menstrual distress which suggest that the intervention program have been the source of reduction in the menstrual distress of the experimental group.

Keywords: Menstrual distress, systematic desensitization, quasi-experiment, intervention.

INTRODUCTION
Menstruation is of reproductive function in the human adult female. It is the discharge of blood periodically and also the sign of disintegration of the endometrium after a normal ovulatory cycle. According to the Society of Menstrual Cycle Research (SMCR, 1986), the reference point for all Menstrual phases is menses that is all days when menstrual blood flows. The length of menses varies between and within women. In India most of the adolescent girls lack knowledge in the menstruation, sex and reproduction. Even today there is a myth existing not only among the rural people, but also among the urban people that menstruation is considered as a curse on women which results in contamination and a feeling of unholy. This makes the girl to feel as if she is too impure and dirty during her time of menstruation. Though it has been found that the mean age of menarche of a normal Indian girl is 13.4 yrs., it is found that half the populations of the adolescent girls who belong to the age of 12-15yrs still have nil information about their menstrual cycle as per the Nutrition Foundation of India’s report. (U.S. Agency for International Development 2001).

Female children are always seems to be underprivileged in India and hence it’s quite natural that these adolescent become vulnerable. During the period of Menstruation they are considered as untouchables. This shows clearly the people do not have proper scientific awareness about fertility and related areas. These responses and attitudes that the girl experience will certainly bring about an aversion towards her sign of maturity. Because of misconceptions about menstruation-a natural process, sometimes result in adverse health issues.

Common Physical Menstrual Complaints Include (Abraham, G.E. 1978)
- Headache
- Backache
- Edema
- Abdominal bloating
- Breath tenderness
- Ache
- Constipation or diarrhea
Common Behavioral Complaints:
- Increased tension or irritability
- Depression
- Aggression
- Decreased energy
- Disruptions in eating, sleeping, work and interpersonal relationships.

Tension and irritability seems to be the one universal Menstrual Complain (Hoes, 1980; Reid & Yen, 1981; Widholm, 1979).45,6

Psychology of the Menstrual Distress: The woman who is ashamed of menstruating is particularly vulnerable to menstrual complaints. Her mother may have coped poorly with menstruation. (Whitehead et al, 1986)7. Her family may have reinforced her avoidant coping with menstruation (Golub, 1981)8. She may also have lacked the education and medical care that counteract unhealthy cultural influences (Reid, 1985)9. Ylikerkala and Dawood (1978)10 suggested that menstrual irritability is a state of conditioned anticipatory fear that reduces tolerance for any environmental event. When Menstrual complaints and such avoidant behavior have become well established, the vulnerable women is likely to be subject to high chronic levels of stress which increase the production of endogenous uterine prostaglandins which in turn could cause more pain during menstruation (Tigranian et al, 1980)11. Premenstrual stress was calculated through their stress score, menstrual discomfort and menstrual blood flow. (Cutts T, Evans T, Christoff K 1983)12. Although most women rate their symptoms as mild, approximately 2% - 10% report severe symptoms, one fourth of the women folk undergo some sort of menstrual distress. (Moos R H 1985)13. Relaxation technique stimulate the sympathetic and parasympathetic nervous system, which balance the physiological functions like heart rate, blood pressure, respiration, temperature, muscle tension and sweating .This exercise helps to eliminate irrelevant muscular tension, brings down the individual’s stress, improve the quality of sleep and calms down the individual to get rid of anxiety and other affective symptoms.(Anice George, 2011;Jyoti Dvivedi, 2007)14,15.

Nidhi Gupta, Shveta Khera, Vempati, Ratna Sharma, and Bijlani (2005)16 conducted a study to assess the impact of short-term and brief lifestyle intervention, applying yoga, on anxiety levels in normal and diseased people at All India Institute of Medical Sciences, New Delhi, India. The intervention package includes yoga Sana, pranayama, relaxation techniques, support group, individual counselling, some audio lectures and videos on yoga, the role of yoga in daily life, meaningful meditation, stress management, and knowledge in nutrition and physical illness. On the first and last day of the course anxiety was measured. Anxiety scores, both state (study group pretest mean 39.6 and posttest mean 34.1 and control group pretest mean 35.0 and posttest mean 36.4) and trait anxiety (Study group pretest mean 43.1 and posttest mean 38.5 and control group pretest mean 36.1 and posttest mean 37.1) were significantly reduced.

HOME REMEDIES
(Source: http://healthruns.com/25-grape-fruit-diet-tips)

1. Grapes and especially black grapes is one of the most effective home remedy for handling menstrual distress. Regular intake of grape juice can perfect the menstruation cycle. However, in summer months, stick to one glasses a day.

2. Make some radish seed paste and mix it with one glass of buttermilk. Drinking one glass every day is one of the effective home remedies for delayed menstruation.

3. Bitter gourd juice twice a day is the solution to all your” periods” problems. There are also other benefits of bitter gourd.

4. Regular intake of aloe Vera juice helps the body maintain regular menstruation cycle.

5. Painful cramp can be overcome by grape juice daily during periods .Grapes juice is unavoidable for dysmenorrhea /painful menstruation and irregular periods.

OBJECTIVES OF THE STUDY
- To assess the trait anxiety and menstrual distress level of the sample
- To employ psychological intervention in decreasing the menstrual distress of the selected sample
- To study the effectiveness of psychological intervention in decreasing the menstrual distress of the selected sample in the experimental group and compared with that of the control group.
DESIGN AND BACKGROUND OF THE STUDY

- A quasi Experimental Pretest- posttest Control group design was used to determine the efficacy of the intervention.
- Seventy unmarried undergraduate college students were taken for the study. Extraneous variables such as age, family, monthly income, health status were matched and hence methodologically controlled. The sample was divided into two groups and they were randomly assigned as experimental and control groups, each constituting thirty five students.
- Initial assessment was made using the scales Moos Menstrual Distress Questionnaire and Spielberger’s Trait Anxiety inventory. Their friends, mothers were interviewed and it was concluded that there was a marked qualitative menstrual distress and moods off during their menarche.
- Administration of relaxation, grape juice and psychological intervention:
  - Relaxation through deep breathing exercise.
  - Systematic desensitization where the hierarchical scenes concerning menstruation has been used for psychological management of menstrual distress. It was based on the findings of Cox and Meyer (1978).
  - Here the subjects were also instructed to practice auto-genic suggestion. And to take grape juice a glass/day.

METHOD

Sample: The researcher used Purposive Sampling method in this study. Total of seventy students were chosen of which thirty students are in the experimental group and thirty students in the control group randomly. Purposive sampling is the sampling technique which assumes that with good judgment the researcher can select the sample units that are satisfying the requirements (Das, 2008).

Purposive Sampling

Sample is chosen with a particular purpose
1. The Sample helps in gaining insights into the particular issue taken for study
2. Number is determined by the availability (Alston & Bowels, 2003)

TOOL

Menstrual Stress Questionnaire was used before and after the intervention. Trait inventory from Spielberger (1983) State-Trait inventory was used where a four point scale is the method of rating on 20 items. The inventory includes eleven anxiety present statements.

The anxiety inventory was used in the study to rule out one of the confounding factors of individual differences in the interpretation of threatening situation among experimental and control groups.

INTERVENTION PROCEDURE

Session I:

A health education package was developed based on extensive review of the literature content outline
- Review the structure and function of female reproductive system
- The physiology of menstruation was explained
- Myths and traditional misconceptions about menstruation were discussed and their doubts were cleared.

Session II:

- Discussion on stress and information on sources of stress were provided
- Discussion on relationship between stress and menstruation
- Deep breathing exercise to induce relaxation.
- Practice the same regularly
- Systematic – desensitization – hierarchical scenes concerned with menstrual distress
- The researcher encouraged the students to relax and then exposed them to imagine an increasingly intense series of experiences. That is enabling them to stay calm and relaxed, even when they were in the most painful menstrual distress
- They were also asked to drink a glass of grape juice daily
- All the above were applied only to the group which is taken as experimental and for the control group only grape juice was provided.
DATA ANALYSIS

Table 1: shows the comparison of trait anxiety among experimental and control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait anxiety</td>
<td>mean</td>
<td>S.D</td>
</tr>
<tr>
<td></td>
<td>1.67</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>1.53</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The results showed that the mean difference was not significant with t = 1.12 indicating that the trait anxiety was not a confounding variable in the study.

Table 2: shows the comparison of pretest, posttest menstrual distress of the experimental group

<table>
<thead>
<tr>
<th>Menstrual Distress</th>
<th>Mean</th>
<th>S. D.</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>9.22</td>
<td>6.4</td>
<td>3.02</td>
</tr>
<tr>
<td>Posttest</td>
<td>6.91</td>
<td>5.1</td>
<td>p &gt; 0.05</td>
</tr>
</tbody>
</table>

The p value demonstrated significant difference which implies that the intervention package has certainly benefited the experimental group.

Table 3: shows the comparison of pretest posttest menstrual distress of the control group

<table>
<thead>
<tr>
<th>Menstrual Distress</th>
<th>Mean</th>
<th>S. D.</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>1.98</td>
<td>1.3</td>
<td>1.02</td>
</tr>
<tr>
<td>Posttest</td>
<td>2.27</td>
<td>1.3</td>
<td>p &lt; 0.05</td>
</tr>
</tbody>
</table>

The p value demonstrated no significant difference which implies the control group remains with the same level of menstrual distress.

DISCUSSION

- This study support for the multi intervention approach where biological and psychological factors were addressed (Ussher, 1992). Also the experimental group reported less menstrual distress after the intervention
- It was also confirmed through the interview with the mothers and peer group of the experimental group that they showed improved social and familial interaction which was not seen initially before the intervention

Our study corroborated findings that our study corroborated findings that At the minimum, girls need to be educated about menstruation much before they attain menarche, and also to have a basic understanding on secondary sex characteristics that will happen during puberty. Research has shown that ignorance and lack of knowledge on puberty and menstruation intensifies the existing myths stronger and the girls are vulnerable to feelings of shame, and anxiety of something which they must be proud of because menarche is the step which finally leads to motherhood of every girl.

CONCLUSION

Results of this study suggest that this package of educating and psychological intervention is necessary to develop a positive self-concept and also a positive attitude towards the normal physiological function, the menarche. It has certainly helped in overcoming the menstrual distress. It is not the nutritive diet alone but also the psychological support had helped in overcoming menstrual distress which was not seen in the control group where the effect of grape juice alone was taken into consideration.

Ethical Clearance: Taken from the ethical committee of the institution constituting the following members:

1. Dr. Geetha Senthilkumar, Head dept.of Humanities
2. Dr. K. M. Mini, Head dept.of Civil Engineering
3. Ms. S. A. Rajalakshmi, Faculty in Humanities
4. Dr. Sasangan Ramanathan, Dean, Amrita Vishwa Vidyapeetham.

Source of Funding: Self

Conflict of Interest: Nil

REFERENCE

4. Hoes, M.J. Implications for Women’s Health -The Chronopathology of Premenstrual


Evaluation of Peak Expiratory Flow Rate (PEFR) in Pet Owners

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¹Graduate Student, ²Assistant Professor, Department of Physiology, Saveetha Dental College, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai

Abstract

Introduction: Lung function tests have been gradually used in evaluating the harshness of obstructive airway disease and also in assessing the outcome of various healing routines and providing an improved understanding of pulmonary physiology. The main aim of this study is to assess the pulmonary function in pet owners.

Materials and Method: People were selected randomly. The subjects were of varying age groups. Then individuals were divided into 2 groups. One group of individuals were pet owners while the other group consisted of individuals who do not own any pets. Each group consists of 30 individuals. The readings were obtained using peak flow meter. Readings were recorded and calculated.

Result: The mean and standard deviation were calculated for both pet owners and healthy individuals. In the control group, the values of the males were found to be 440±15.51. In females the value was found to be 414.70±23.25. In the pet owners group the value of male pet owners were found to be 425.38±59.38. In females the value was found to be 377.64±64.64. The values of pet owners were significantly less compared to the control group consisting of non- pet owners.

Conclusion: Although this research was not significant due to certain factors, further research could be done on this topic to further establish the relation between humans and pets.

Keywords: PEFR, pet owners, respiratory disorders, airflow, peak flow meter.

Introduction

Peak expiratory flow rate (PEFR) is one of the simplest ways to check lung function. It shows the vital signs of airway obstruction. Peak expiratory flow rate is measured using mini wright peak flow meter. It has a great analytic and predictive value in subjects with respiratory diseases and disorders. It is extensively used in general medicine in the European nations and in the USA with demonstrated reputation in assessing and observing patients with asthma [1,2].

The Mini-Wright Peak Flow Meter is portable and can easily be used in an office setting or lent to patients for home use. Some patients may benefit by purchasing the meter themselves and self-adjusting the time and dose of their medication based on objective measurements of airway obstruction [3].

Widely used standard peak flow rates have not been established for pet owners and the PEFR tables in use are based on studies in the Western countries [4,5]. Numerous factors can influence the reading of peak expiratory flow rate (PEFR). The height, weight, gender and age are vital factors upon which peak expiratory flow rate rest on [6]. Other features include the racial variances.

The level to which equally the tutor and the subject understand the technique of using the flow meter is vital and can significantly influence the outcome [7,8]. The associations of peak expiratory flow rate with pulmonary indications and other indices of long-lasting illness raise the likelihood that peak expiratory flow rate will predict death in an ageing population [9]. The aim of this study is...
to determine whether owning pet animals brings about change in Peak expiratory flow rate.

Materials and Method

People were randomly selected and were divided into 2 groups with age group ranging from 15 to 50 years old. One group of individuals was pet owners while the other group consisted of individuals who do not own any pets. Each group consists of 30 individuals each. The readings were measured using mini Wright peak flow meter. First the subject must slide the marker all the way to zero on the scale. He/she should be seated or has to stand up straight. The subject should take in a deep breath. The mouthpiece is then placed in the patient’s mouth which is then followed by a fast and forceful expiration. The marker will move on the scale indicating the peak expiratory flow rate. The best reading from 3 repeated attempts is taken and used. Subjects should not average several attempts as the lower readings usually represent faulty technique or poor effort. This was recorded on the table along with subject’s name, age, pet owned, time period the pet was owned for and the 3 peak flow meter readings. Results were calculated.

Results

Totally 15 individuals were enrolled in this study of both sexes. The results were expressed in mean ± SD. The collected data was compared to normal PEFR values and was assessed by unpaired ‘t’ test. The results were non-significant between control and pet owners.

<table>
<thead>
<tr>
<th>Table 1: Mean and SD of Males and Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: PEFR in both groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Pefr</td>
</tr>
</tbody>
</table>

Discussion

Calculation of lung functions both qualitatively and quantitatively in both hale and hearty and sickly individuals has become vital in the ground of Respiratory medicine. Measurement of PEFR has achieved worldwide reputation in clinical practice for assessment of patients with obstructive and restrictive airway sicknesses [14].

In the table 1, the relation between males and females were made. The value of control group for males and females were found to be 440±15.51 and 414.70±23.25 respectively. The value of pet owners for males and females were found to be 425.38±59.38 and 377.64±64.64 respectively. The values of pet owners is lesser compared to the control group. In table 2, the relation between the individual’s age and the PEFR values. Taking age as the factor, the value for the control group was found to be 35.28±16.38. The value for the pet owners was found to be 38.26±16.38. Taking the PEFR values as the factor, the value for the control group was found to be 423.66±43.58. The value for the pet owners was found to be 404.66±90.35. In this case also the values of pet owners is lesser compared to the control group. Among the Indian population, racial variances have been revealed to account for the dissimilarities in the pulmonary functions [15]. Obstruction of the airways is associated with daytime sleepiness, poor quality of life, road traffic accidents, and an increased risk of cardiovascular disease, systemic hypertension, type 2 diabetes, depression, cognitive impairment, and cor pulmonale, left ventricular dysfunction, cardiac arrhythmias, stroke and premature death [18]. COPD manifests as inflammation of the lung connective tissue caused by irritants such as smoking and dust particles, resulting in narrowing of the airway [19].

The factors affecting this study were, the difference in the age groups of the patients. The study was taken randomly and there was no particular age group, so it could affect the accuracy of the data. Also there is no equality among the number of males and females owing to the randomness of the study. Sensitization to domestic pets, particularly cats and dogs, is an important risk factor for allergic diseases, such as asthma and allergic rhinitis. Although cat and dog allergens are known asthma triggers and can influence disease severity among sensitized individuals, their role in the development of sensitization and allergic disease is less clear and has remained a subject of debate. Recent studies propose
that pet exposure, particularly in early childhood, may have valuable effects and may actually avert the advance of atopic disorders. Although the complicated relationships between pet exposure and development of allergic sensitization and sickness are not completely understood, potential biological mechanisms that may underlie the protecting effect of pets have been projected. Considerable proof has arisen to prove that opinion.

Many authors have also found a noteworthy positive association of PEFR with age, height, and weight, out of which height has been highly correlated with PEFR. The individual’s age was taken as a factor and the value for the control group was found to be 35.28±16.38. The value for the pet owners was found to be 38.26±16.38. Since height has been maximally correlated with PEFR, the age wasn’t a significant factor. The p value was found to be 0.30 (p < 0.05). The peak flow meter has some limitations. Results are sometimes not reproducible over a long period and there may be inter-model variation in the values of readings obtained. Asthma affects people of all ages and the most common trigger is continuous exposure to allergens. Allergic asthma is characterized by increased mucus production, reversible airway obstruction, infiltration of eosinophils and nonspecific airway hyper responsiveness.

Conclusion

Even though this research was considered insignificant, this opens a wide range of opportunities for further research. Future research could help to discover new medications for allergies caused by pets. This is a field with potential and can very well be utilized to improve the coexistence of man with pet animals.

Conflict of Interest: None declared

Source of Funding: Nil

Ethical Clearance: Taken from Saveetha dental college IHEC

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A Survey Study on Causes, Treatment and Prevention of Onychocryptosis

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Abstract

Introduction: An ingrown toenail, also called as onychocryptosis, is one of the most common disorders of the toe. It is described as the extension of the side of the nail inside the nail bed which causes bleeding, sharp pain and possible infection can occur. The main causes of this condition are any injury to the nail, bacterial infection of the nail bed or wearing tight fitting shoes on a daily basis. The aim of this research is to check the status of ingrown toenails in an area.

Materials and Method: 26 people ranging from the age 12 to 60 who have had ingrown toenail in the past or had ingrown toenail during the time of data collection were included. Their preferred type of footwear, occupation, treatment taken, places visited often before the condition developed were recorded and the cause of their disorder was deduced. Based on these data, the methods to prevent ingrown toenails were deduced.

Result: Teenagers are more prone to ingrown toenails than any other age groups. Stage 1 was the most common type of ingrown toenail. Out of the people who had ingrown toenails, most of them wore poorly fitting shoes. Trauma to the nail was the most common cause of ingrown toenail. Conservative Therapy was the most common type of treatment for ingrown toenails.

Conclusion: Ingrown toenail is one of the most common nail disorders. Since teenagers are the most agile group, they are more prone to the disease. This disease can be easily avoided by maintaining the hygiene of the feet and by wearing proper fitting shoes.

Keywords: Ingrown, trauma, shoes, matricectomy, hygiene

Introduction

Onychocryptosis also has known as ingrown toenailis a common nail disease. Ingrown toenails are common worldwide and diverse treatment options are available [7]. It is the most common in teenagers and young adults during the second and third decades of their life [1]. The condition most commonly involves the great toes [8]. Many factors have been theorised to contribute to the formation of ingrown toenails, such as improper trimming of the nail, repetitive or inadvertent trauma, genetic predisposition, and poor foot hygiene [3]. The commonest symptom is pain in the affected nail which, if left untreated leads to infection, discharge and difficulty in walking, greatly hampering the quality of life of the individual. Diagnosis is apparent and several treatment approaches exist, ranging from a conservative medical approach to extensive surgical treatment options. The therapeutic approach chosen is dictated by the severity and formstage of the ingrown toe nail [1].

Various theories have been proposed to explain the aetiology of the ingrown toenail and they can be broadly classified according to whether the primary fault is the nail itself or the soft tissues at the side of the nail. One theory is that the nail is not the real culprit, and it is
actually the excess skin surrounding the nail which is the real problem. The person who develops this condition has an unusually wide area of tissue which spreads medially and laterally to the nail. Over time, with weight bearing, this tissue tends to bulge up around the nail which leads to pressure necrosis. A prospective study by Pearson and colleagues failed to demonstrate any abnormality of the nail in patients with symptomatic ingrown toenails, and suggested that treatment should not be based on the correction of a non-existent nail deformity. Although it is still believed that the real defect lies in the nail, the controversy of whether there is a nail plate abnormality or overgrown nail folds still exists[1].

Although an ingrown toenail can occur in any age group, teenagers are usually most prone to this disease. In teenagers, increased perspiration causing the nail fold to become soft and participation in sports result in the production of nail spicules, which can pierce the lateral skin fold of the nail apparatus. In older persons, spicules can be formed by reduced ability to care for their nails which can be caused due to reduced mobility or impaired vision. In addition, the natural aging process causes the toenails to increase in thickness which making them more difficult to cut and more inclined to exert pressure on the lateral skin at the sides of the nail plate, which leads to increase in the severity of the condition[2]. The aim of this study is to find the causes, treatment taken and the possible ways to prevent ingrown toenails.

**Method and Materials**

Patients, aged between 12 and 60 years with a clinical diagnosis of an ingrown toenail were included. The affected toe and foot were evaluated at baseline for the stage and type of ingrown toenail and the condition of the nail structures using the following criteria: Stage 1 was defined as the presence of only mild erythema or edema, with pain on applying pressure, Stage 2 as significant erythema or edema with sero-purulent drainage from the affected nail fold and Stage 3 as significant drainage, formation of granulation and lateral wall hypertrophy. At baseline, a potassium hydroxide (KOH) mount of the nail clipping was examined to rule out fungal infection for all patients with nail thickening, distal onycholysis, or subungual debris[5].

The patient’s age, sex, the types of their footwear and the places which are frequently visited by them were recorded. This was done to help analyse the cause of their condition. The records taken ranged from fresh to old cases. The treatment they sought (if any) was also recorded. Based on these records, the causes for the condition were also deduced.

Ingrown toenails are not difficult to diagnose. Usually self-diagnosis can identify the condition. Since this condition is so easy to diagnose, many patients try to cure it themselves. This complicates the condition as the severity of the disorder cannot be self-diagnosed. It is best for the patients to consult a specialist before trying to treat it themselves.

**Result**

53.8% of teenagers were affected from ingrown toenails. Most of the subjects wearing shoes were having this problem than others wearing sandals, slippers and barefoot. According to this survey, stage 1 was the most common among this study population. Trauma is the primary cause for this type. 38.5% of subjects felt conservative treatment plan is the remedy for ingrown toenails.

**Graph 1: Age Group most prone to ingrown toenails**

**Graph 2: Type of footwear worn by patients**
Discussion

The data confirmed that the most common age group who are affected by onychocryptosis are teenagers (graph 1). Another thing that came to light was that the most common cause of ingrown toenail was trauma to any side of the nail. This backs up the hypothesis that teenagers are more prone to ingrown toenail rather than adults because teenagers are more agile, flexible and energetic than adults. So, it is more likely for them to suffer trauma in their foot (graph 4). The second most common reason for occurrence of ingrown toenail is wrong size of footwear. Another thing was found out was that the most common treatment for Stage 1 and Stage 2 onychocryptosis is Conservative Therapy (graph 5). The data also shows that in some cases, no treatment was done. One other thing to be seen was that people who go to places which has a dusty environment or to places where physical activity is done (eg. Places like the football ground and the badminton court) are more prone to ingrown toenails via bacterial infection or excess sweating than other people if they don’t take care of their feet.

This is so because most of the time, Stage 1 and Stage 2 ingrown toenails do not show complexities that requires surgical corrections. One of the techniques in conservative therapy includes soaking the affected toe and foot for 10 to 20 minutes in warm, soapy water. After each soak, apply Neosporin or a mid-potency steroid cream to the affected area several times daily for a few days\(^3\). The most popular conservative therapies techniques include warm water soaks, antibiotic therapy, proper nail trimming, and elevation of the corner of the nail with a cotton wick \(^{15}\). The second most common reason for occurrence of ingrown toenail is wrong size of footwear. People often compromise on their footwear when it comes to compatibility. This puts a lot of pressure on the toenails which often leads to a wound in the skin below the nail as it was already under pressure. The data also shows that in some cases, no treatment was done. In the cases were the patient did not take any treatment, the patient let the wound heal itself without any interference from the outside. The condition can recur if proper care is not taken. Recurrences are reduced when some form of matricectomy is used. If meticulous attention is paid to technique and good advice is given to the patient, recurrences can be minimised \(^9\). There are various types of matricectomy techniques and it should be selected on the basis of patient preference \(^4\).

Sometimes, surgical methods are used. Total matricectomy is done for stage IV onychocryptosis in adult patients, onychogryphosis and chronic hypertrophy of the distal and lateral folds. Nail excision and total matricectomy with phenol is performed \(^{18, 19}\). Phenol-Alcohol technique is a procedure which comes under chemical matricectomy. The phenol-alcohol technique is safe in diabetic patients who have no vascular risk and have good control of their diabetes \(^6\). The nail splinting technique is a successful, simple and non-invasive therapeutic method for treating ingrown nails. \(^{8}\) Simple excision of the matrix using
mechanical procedures is most effective, leading to fewer complications and infections and with a shorter healing time. Trichloroacetic acid matricectomy showed a low recurrence rate with minimal side effects and was easy to perform in outpatient clinic. The aesthetic reconstruction technique involves complete removal of the nail plate and debridement of the granulomatous tissue, after which wedge-shaped ellipsis of skin and subcutaneous tissue, lateral to the affected nail fold, is removed. The gutter treatment consists of introducing a small guard along the side of the toenail and requires only three sittings. The gutter is left in place for eight to twelve weeks and then removed. The gutter treatment requires little skill and can be carried out in general practice. Electrocautery, radiofrequency, and carbon dioxide laser ablation of the nail matrix are also options for removal of an ingrown toenail. Local anaesthesia should be performed cautiously to avoid vascular complications as toe necrosis has been reported as a rare serious complication of ingrown toenail surgery. A study done by Grover et al showed that Phenol-Alcohol technique was an effective way of treating the disorder should the patient undergo chemical matricectomy. Similarly, a study done by Wallace et al showed that gutter splint technique can be a reliable treatment for ingrown toenail.

**Conclusion**

This study concluded that 1) Teenagers were mostly affected by this disorder. 2) The most common type of ingrown toenail was Type I. 3) The most common type of treatment for ingrown toenail was conservative therapy. 4) People who do a lot of physical activity or work in a dusty environment are more prone to ingrown toenails. 5) The disorder in these cases could have been prevented if proper care of the nails were taken. Things like wearing shoes of proper size and cleaning of the toe are the main prevention methods to prevent ingrown toenails.

**Conflict of Interest:** None declared

**Source of Funding:** Nil

**Ethical Clearance:** Taken from Saveetha dental college IHEC

**References**


Effect of Cooperative Learning on off Task Behaviour: An Action Research Approach for Better Academic Performance

Kalpana Sawane¹, Sheela Upendra², Sheetal Barde¹
¹Asst. Prof., ²Assoc. Prof., Symbiosis College of Nursing, Symbiosis International University

Abstract

Background: Disruptive off-task behaviour can interfere with the continuity of an average classroom performance. Learning in groups and teams can help equip students to brainwave their critical thinking skills that will prepare them to enter today’s workforce.

Objective: The main objective of the study was to implement Cooperative learning and to see the effect on off task behaviour of students in the view to improve the academic performance of students.

Material and Method: One group pertest post-test design was adopted to implement Cooperative learning on 40 Baccalaureate Nursing students. The sample were selected by purposive sampling technique. Checklist was used to assess the off task behaviour and academic performance test were conducted to measure academic performance.

Results: Day wise academic performance was assessed and it was found that there is reduction in off task behaviour of students from day one to day seven. Cooperative learning has positive effect on good academic performance evident by Wilcoxon Sign rank test.

Keywords: Off task behaviour, Cooperative learning, Academic performance

Introduction

Disruptive off-task behaviour can interfere with the continuity of an average classroom performance. One of the greatest challenges of the teacher is to maintain order in the classroom to assist students so they can achieve academic objectives Frequency of misbehaviour, including off-task behaviour, talking without permission, moving without permission, aggression, daydreaming, inattentiveness, and playing with something or someone are all common concerns of educato today¹. Rathvon (1990) defines off-task behaviour as students doing anything not appropriate to the task at hand. Off task behaviour interfere with academic growth as it creates distraction in the class and affects the concentration.²

Cooperative learning means method which learners work in a small group members or teams which contain 3 to 6 students with heterogeneous capacities work together until attain goal that both whole group get it. Group work is highly appreciated by students as a means of learning and preparing for future work

Cooperative learning in universities is based on the theories of cognitive development, behavioural learning and social interdependence. Cooperative learning has been linked to a range of positive social, effective and psychological outcomes, including social support, the quality of students’ relationships, attitude to learning, learning skills and self-esteem. Cooperative learning is based on the theories of cognitive development, behavioural learning and social interdependence. Cooperative learning has been linked to a range of positive social, effective and psychological outcomes, including social support, the quality of students’ relationships, attitude to learning, learning skills and self-esteem.³

Cooperative learning has changed classrooms from being “teacher-centred,” where the focus is on the
teacher imparting knowledge to the students, to “student centred,” where the students are expected to take a more vigorous part in their own learning.4

Teachers have seen an increase in the lack of social skills being taught to students which has amplified the students’ lack of control in their behaviour and respect for others. Often, students feel little respect from teachers and do not have the skills themselves to respect others or to control their behaviour. One of the greatest challenges of the teacher is to maintain order in the classroom to assist students so they can achieve academic objective.5

**Purpose of the study:** The off-task behaviour typically begins with one person who does not want to focus on his work and his behaviour becomes distractive, which disrupts and gathers wind with some of the other students in my class.

As a teacher in the college, I have observed a large amount of disruptions in my class whenever I discuss or ask questions in class, a great majority have to do with students speaking out of turn, having side conversations. Only few students used to participate in discussion. Those who are not participating they keep busy in their own conversations and when asked for response they usually have nothing to say or participate superficially. This results in bad performance at the time of assessment. As a teacher I was thinking to overcome this problem for the better achievements of students. I want to see whether the cooperative learning is really impacting them to be more creative rather than distracting. Also I want to see whether there is any change in the academic performance and that change is by chance or it is associated with cooperative learning. Based on these factors in my mind I set the following objectives for my action research.

**Objectives**

1. To implement the cooperative learning technique
2. To assess the effect of cooperative learning on off task behaviour of students
3. To assess changes in academic performance after cooperative learning
4. To find the association between cooperative learning and academic performance

**Material and Method**

**Design:** The research design selected for the study was one group pertest and post-test design

**Setting:** Setting of the research study was Symbiosis College of Nursing, Senapati Bapat Road, Pune, India.

**Target population:** Target Population for the present research is BSc Nursing 2nd year of Symbiosis College of Nursing who have joined in the year 2015-16.

**Tool:** A Checklist was developed to observe off task behaviour and Academic test in the form of Multiple choice questions were prepared in order to assess the off task behaviour and academic learning of the students

**Procedure for Data Collection:** Prior information was given to the Head of Department of research at Symbiosis college of Nursing Pretest in the form of Academic test was taken on 30 July before the implementation of cooperative learning.

The cooperative learning was implemented. 8 groups were framed. There were 5 students in each group. I informed about the cooperative learning to the students. Groups were made keeping in mind the diversity of the group. The instructions were given and task was explained to the students every time when the class has been conducted. The cooperative learning was implemented from 2 Aug to 8 Aug 2016. The timing of the class was same for all same days. I tried to maintain the environment as smooth and conducive as possible to conduct. Cooperative learning. A comfortable classroom was selected and the participants were made comfortable and relaxed. Time taken for one session was 1 hour.

I took additional assistance of Dr. Sheela Upendra, Assoc. Prof. at Symbiosis College of Nursing to observe the off task behavior. A separate session was conducted to explain her about the details, objectives, purpose of the research before the implementation of Cooperative learning. The Post test in the form of academic test was taken on 8th day of the implementation of the cooperative learnin

**RESULTS**

**Section 1:** Demographic characteristics calculated by percentage where maximum students were in the age group pf 17 to 18. 9 were male and 31 were female students.
Section 2: The effect of cooperative learning on off task behaviour of students

The off task behaviour was marked in the checklist as either yes (if present) or No (if not present).

Day wise the score that is number of Yes (= 1) is decreasing. So graph show decreasing pattern of off task behaviour all together for 8 groups. This is a good change in academic performance after implementing cooperative learning.

Section 3: Changes in academic performance after implementing cooperative learning: There is sufficient evidence to reject the null hypothesis (p < 0.05). The population median is statistically different from 0. Here estimated median is 1. So using this, I can conclude that there is positive effect of cooperative learning on academic performance of students.

Table 1: Comparison of Pertest and Post Test

<table>
<thead>
<tr>
<th></th>
<th>Pre test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.825</td>
<td>4.8</td>
</tr>
<tr>
<td>Median</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Mode</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.034965626</td>
<td>0.992277877</td>
</tr>
<tr>
<td>Sample Variance</td>
<td>1.071153846</td>
<td>0.984615385</td>
</tr>
</tbody>
</table>

Section 4: Association between cooperative learning and off task behaviour: Chi-square test for association between the questions response of pre-test and post-test. All the p-values are less than 0.05, Hence shows there is association between cooperative learning and academic performance.

Discussion

The present work emphasised on the off-task behaviour in nursing students during the class and to investigate the relationship between cooperative learning to reduce the off task behaviour and its effect on academic performance of students. Specifically, we examined whether this pedagogy of group work is really effective in reducing the off task behaviour or not. Our findings indicated that cooperative learning is having a positive effect in reducing the off task behaviour among students as students are utilising same destructive energy into the constructive group work of learning and problem solving.

This pedagogy engage the students in the goal oriented activity. Instructional activities that are more motivational are in turn increase students’ on-task behaviour. A state of focused attention is raised when instruction consists of team work and cooperative behaviour.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Taken from SCON Research Advisory Committee

References

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“A Phenomenological Study: The Experience of Mental Health Nurse in Managing Violent Behaviour of Psychiatric Patient”

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Abstract

Introduction: Patient violence against health care personnel at work is a widespread global concern, particularly in the fields of mental health care. The present study would add on to the existing data on the managing violent behaviour experience by the nurse in psychiatric ward.

Research question: What are the lived experiences of nurses, in managing violent behaviour of psychiatric patients?

Material and Method: Qualitative research approach was adopted. The phenomenological approach was selected as it provides the nurses with the opportunity to give a detailed account of the ‘lived experiences’ from their perspective on violent behaviour of psychiatric patients. The samples size was 05 Nurses from Psychiatric Hospital of Pune city. A purposive sampling technique was used. The researcher collected the data regarding the lived experiences of nurses, who manage violent behaviour of psychiatric patients, through in-depth interviews. The quality of the data collected was significant and determined by addressing the authenticity (triangulation and member checking done) Dependability and transferability.

Findings: Themes that were emerged includes Divergent Selfcare, High expectations, Action in violence and Safety and Security.

Conclusion: Violent behaviour of psychiatric patients against nurses working in psychiatric hospitals is a serious consequence of nursing work in a mental health care setting. The anguish caused by the violent behaviour of patients on Nurses is manifested through a range of emotional reactions in nurses.

Keywords: Experience; Mental Health Nurse; Violent Behaviour; Psychiatric Patient; Manage

Introduction

Patient violence against health care personnel at work is a widespread global concern, particularly in the fields of mental health care.¹ Most psychiatric patients are not violent, from various long studies have determined that serious mental illnesses such as schizophrenia are associated with an augmented risk of aggression and violence. Aggressive behaviour can range from irritability and anger to verbal aggression, progressing to physical acts of violence. Aggression has been defined in different studies using different terms like agitation, violence, dangerousness, violent crime, and hostility, with each of them classifying it differently.² Violent events may also have an impact on nurses’ well-being in the form of, for example, post-traumatic symptoms, fear, work-related stress, anxiety, blame, and the feeling of being insulted.³ A high prevalence of violent events may also impair the overall ward climate and thereby erode the quality of patient care.⁴

Need of the Study: Regardless of relatively thin body of research literature regarding the experiences of Mental Health Nurse in managing violent behaviour, searches indicated that there is dearth of studies in the field and is needed on occupational support provisions that reduce the risk of staff experiencing verbal and physical violence and the stress that is associated with it. There is scarcity of Indian data towards this facet. Therefore the present study would add on to the existing data on the managing violent behaviour experience by the nurse in psychiatric ward.

Purpose of the study: To explore the lived experiences of Nurses in managing violent behaviour of psychiatric patients.

Research Question: What are the lived experiences of nurses, in managing violent behaviour of psychiatric patients?

Operational definitions:

Experience: Mental Health Nurse who is working in the psychiatric hospital and involved in providing care to violent and aggressive patients, those who are admitted in the hospital.

Mental Health Nurse: Registered Nurses with minimum five years of experience in psychiatric ward and involved in direct patient care in Psychiatric hospital

Violent behaviour: Behaviour of psychiatric patient that threatens or harmful to self, other patients in the ward, health care professionals or destroys property in the psychiatric ward/hospital.

Psychiatric patient: Patient with mental illness predominately with violent behaviour that causes significant distress or impairment of personal functioning and is admitted in the psychiatric hospital in Pune city.

Inclusion Criteria:

- Nurses who have more than five years of experience in psychiatric ward.
- Nurses who are involved in providing mental health care to mentally sick patients.
- Nurses who will explore all answers genuinely and with openness.

Exclusion Criteria:

- Nurses will be on leave at the time of data collection.
- Nurses who will be unwilling to participate

Material and Method

Qualitative research approach was adopted. The phenomenological approach was selected as it provides the nurses with the opportunity to give a detailed account of the ‘lived experiences’ from their perspective on violent behaviour of psychiatric patients. The samples size was 05 Nurses from Psychiatric Hospital of Pune city. Data saturation was reached after the fourth interview as no new themes emerged from the interviews. A purposive sampling technique was used. The researcher collected the data regarding the lived experiences of nurses, who manage violent behaviour of psychiatric patients, through in-depth interviews, which lasted between 30 to 60 minutes. The researcher took field notes encompassing of observations made during the interview and due importance was given to nonverbal expressions. An interview guide with open-ended questions, relating to nurses’ experiences, was used. The Nurses were asked to share their experiences without disruption. Each Nurse were given time to speak comprehensively. Probing questions were asked, to obtain clarity or redirect the interview.

A pilot study was conducted and found to be reliable and feasible for the study. Qualitative rigor was done, Investigator ‘Bracketed’ her own feelings and experiences about the topic under investigation and through. The quality of the data collected was significant and determined by addressing the authenticity (triangulation and member checking done) Dependability and transferability. Transferability was ensured by the presentation of a dense narration of the participant’s research context and setting.

Seven steps of Colaizzi’s phenomenological method of data analysis were followed for data analysis process.

Findings

Description of Demographic Variables: All nurses were female registered nurses and are registered with State Nursing Council. The ages of the participants were ranged between 30-42 years. Professional experience for the participant group was ranged from 5 -18 years working in Psychiatry ward.

Themes That Emerged

Theme 1: Divergent Selfcare: Controverting experiences from the nurses was noted. While caring for violent patient and aggression, self-care remained secondary for the Nurses. Nurses have preferred nursing care for the patients than self-care and self importance. One sub-theme that fall under this theme is
fascination. Nurses being having experiences of violent behaviour, they continued to perform work in a normal way in wards.

“I really don’t bother much, even when my patient shows aggression or violent behaviour towards me. (P 04).

Another Nurse has accepted that no alternative is left to overcome when it came for patient caring. As described by the participants:

“… don’t have an alternative, while on duty … I consider and take as part of my job’ (P02).

**Theme 2: Action in violence:** Under this theme, nurses labelled a variety of Physical violence and emotional responses at the hands of the patients. Sub-themes that emerged under this theme was Physical violence and emotional trauma. Physical violence covered pushing, slapping, swelling etc.

…..I experienced numbed when I was first hit in the mid of the ward in presence all patients and relatives”(P04).

Nurses feel sometimes helpless and they felt at not being able to protect themselves, when patients show anger on them. Some nurses realised that retribution was not an option, as the patients were mentally ill, as expressed by the participant:

“……..At times feel I should react but soon realized that these are the symptoms and I should present cool and show professionalism” (P01)

**Theme 3: High Expectations:** This theme reveal that inspite of proper caring, the responsibility seeks more demands in all domains to the management of patients’ negative behaviour. This lead to unhappiness amongst them during job. Subthemes emerged as managing aggressive behaviour. All time demanding is a difficult task to manage the patient or else show aggression. The following statement refers:

“..........do it now, I am asking and you are attending other patients” (P03).

**Theme 4: Safety and Security:** This theme refers to the backing service expressed by the nurses; at times it is difficult to handle too much. Subtheme emerged under this theme is Felt need welfare facility and safe working environment. As it is risk to work in the ward where both male and female to be equally taken care and to keep records update and lapses leads to loss in nurses side. Insecurity during night is a safety concern to be taken care.

“… my mother in law is against of night duties in the ward even I fell insecure at times due to aggressive behaviour of few patients.” (P02).

**Discussion**

Physical assault of nurses was significant in this study, as the nurses reported being physically assaulted by patients.

Similar findings have been reported by Bilgin (2009), who found that 53% (n = 162) of the participants of the study were physically assaulted by patients, who had been diagnosed with severe mental disorders[5]

**Conclusion**

Violent behaviour of psychiatric patients against nurses working in psychiatric hospitals, is a serious consequence of nursing work in a mental health care setting. The anguish caused by the violent behaviour of patients on Nurses is manifested through a range of emotional reactions in nurses. Violence against nurses is under-reported, the challenge that remains is,

‘How can nurses be sustained in distressed environment, if the magnitude of the problem is unknown?’

**Implications**

**Nursing service:** Nurses should be involved in decision-making around patient care, which would lead to a sense of self-empowerment. Health care personnel should be encouraged and supported to report incidents of violence in a supportive environment.

**Nursing Education:** Skill development workshops on the management of aggression to equip health care team with skills to manage aggressive patients. The findings of the study will be very beneficial for nursing education because it will motivate the nursing scholars to conduct further studies on violent behavior of psychiatric patients.

**Nursing Administration:** Specific policies relating to the processes of incident reporting should be formulated and implemented, so that Nurses can be assured that their
well-being is important. Findings of the study will help nurse administrator in organizing short term courses for nurses regarding violent behavior of psychiatric patients in hospital and nursing colleges.

**Nursing Research:** The findings of the study are beneficial for the researchers for extensive research in violent behavior of psychiatric patients. The findings of the study will serve as a basis for the professional and student nurses to conduct further studies on violent behavior of psychiatric patients.

**Limitations**

- The study population was purposively selected to fulfill particular inclusive criteria and, therefore, not all the nurses, employed at the hospital, could be selected to participate in the study, which resulted in a small number of samples.
- The findings could also not be generalized, as the study was conducted at only one psychiatric hospital with a limited sample, which is not representative of all nurses at the participating hospital.
- The study was limited to Phenomenological research design.

**Conflict of Interest:** Nil

**Source of Funding:** Self-Funded

**Ethical Clearance:** Ethical approval to conduct the study was obtained during the Institute ethical committee presentation. Written permission to conduct the study at the hospital was also obtained from the administrative department of the hospital. Informed consent was obtained from each sample. Confidentiality was also maintained in the study by concealing the names of the samples, as different codes were allotted to each sample during the interviews and when the results were made.

**References**

Impact of Yoga on Coping Styles of Mid-Level Managers–An Experimental Study

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Abstract

Recently, the daily news is overloaded with reports of human atrocities in the society due to the presence of uncontrolled emotions in human life. This is because of high degree of anger and frustration caused by the manifestation of emotional weaknesses which leads individuals in adopting negative coping styles. Research studies have shown that yoga has played a constructive role in enhancing emotional intelligence which in turn leads to adaptation of positive coping style. But how far yoga impacts one’s coping style on mid-level managers has not been dealt so far and hence the current study is undertaken to explore the research gap. For this purpose an experimental study on 105 mid-level managers belonging to HTC Global Services, Chennai was undertaken. The mid-level managers were divided into 70 and 30 mid-level managers under experimental and control group respectively. The Simplified kundalini yoga training was imparted for 25 sessions, each session consisting of 1 hour 15 minutes. Data was elicited through multi-dimensional coping inventory (Carver et al., 1989) from both the groups before and after Simplified kundalini yoga training. Paired ‘t’ test was used to analyze the collected data and the results has shown significant improvement in emotion focused coping and significant decrease in avoidance focused coping in the experimental group after Simplified kundalini yoga training in comparison to the control group. Though increased mean scores for problem focused were observed after yoga training in comparison to control group, the results were not statistically significant. Therefore, the present study has revealed that regular practice of yoga can have an impact in making individuals adopt a positive coping style and reduces maladaptive coping to an extent to face challenges in their career and attain success in life.

Keywords: Simplified kundalini yoga, mid-level managers, problem focused, emotion focused, avoidance, impact

Introduction

For almost a decade, organizational stress and workplace health have become an issue of concern for employees in general and managers in particular. Owing to the fact, that managers’ are considered as the key persons, their efficient performance highly influences the overall success of the project. The stress is even more among the mid-level managers because they tend to face multitude of stressors with the limited authority and resources. Consequently, the workplace stress affects their physical and mental health tremendously ¹. Research studies has shown that mere work load cannot mount pressure on the employees but it may also arise due to lack of individual’s control on stressors which may cause disappointment, low motivation, instability and disabling pressure ².

Research evidence has proved that individuals employ coping strategies whenever they are exposed to stressful conditions. These coping strategies or a style very often leads in enhancing their adaptation with the environment and help in preventing negative outcomes of overload. Various techniques are employed to control or lower stress, and to amend stress coping strategies and behavior. Yoga is one such technique which is used as both preventive and recovery method to control stress and amend stress coping strategies/styles ³. The current study focuses on three coping style viz problem, emotion and avoidance coping styles. Problem focused style focuses on the stressor or altering the problem. Emotion focused emphasize more on emotions rather than problem but avoidance focused style totally ignores or avoids the stressor.
Yoga and Coping–Literature review: Over the last decade, yoga, one of the six foundations of Indian philosophy has become a popular subject for the researchers. Patanjali, popularly known as ‘Father of yoga’ defined yoga as ‘Chitta Viritti Nirodha’ – a state of complete control over fluctuations of mind- the intellect and the ego. Research studies have shown that yoga has a positive impact on both physical and mental health such as *Musculoskeletal Disorders*[^4], *Chronic Bronchitis and Asthma*[^5], *chronic insomnia*[^6], *Post menopausal problems*[^7] and *Hypercortisolemia*[^8].

Apart from research studies on physical and mental health, evidence has also shown that several studies on yoga have proved its dominance in the field of management. Yoga has played a phenomenal role in *Transformational leadership*[^9], *Organizational Citizenship Behavior*[^10], *Emotional Intelligence & Empathy*[^11], *Personality development*[^12]. A recent quasi experimental study on coping styles conducted on 34 nurses working in intensive care units for 8 weeks has revealed significant difference of stress focus; emotion focus and state-trait focus strategies among experimental group in comparison to the control group. The study has shown increase in mean scores of emotion focus and decrease in mean scores of state-trait focus strategy[^3]. Similarly yoga intervention has led to better problem focused coping style among nurses[^13] and among informal caregivers[^14].

The above reviews have revealed that no systematic attempt has been established so far to study the impact of yoga on coping styles of mid-level managers. Hence, Simplified Kundalini yoga (SKY), one of the popular yoga style developed by Shri. Vethathiri Maharishi is used for the current study to explore the research gap.

Inclusion criteria:

i. Participants should be in the category of mid-level managers.

ii. Participants should have not prior experience in yoga practice and should not have participated in any yoga program/research program.

iii. The participants should not suffer from major ailments or undergone surgery in the recent past.

iv. The participants were requested to maintain minimum of 80% attendance. However, attendance on *kayakalpa* session, *agna* and *shanthi meditation* was made compulsory.

Duration: Simplified Kundalini Yoga training program was conducted for 3 days in a week i.e., Tuesday, Thursday and Friday for 8 weeks from 5.pm to 6.15 pm. (25 sessions). The training period was from July 11th 2017 to September 7th 2017.

Training procedure: Simplified kundalini yoga popularly known as SKY yoga is a holistic approach consisting of 4 components such as

-Kayakalpa yoga exercise–for strengthening life force

- Simplified physical exercises–for physical fitness

- Meditation practice–to reduce the frequency of mind

- Introspection courses–To create in-depth awareness about one self and others emotions.

The training imparted to the mid-level managers was conducted in 3 phases which are as follows:

I phase–Exercises (1 to 8 sessions): In the initial stage, focus was given to the physical exercises and asanas, so that, the participants are ensured of physical fitness to prepare themselves for meditation process.

II Phase–Meditation (9 to 17 sessions): Three levels of basic meditation steps are imparted such as *Agna, Shanthi and Thuriya* meditation

III Phase–Introspection courses (18 to 24 sessions): After the second phase, Introspection courses, such as analysis of thoughts, moralization of desires, neutralization of anger, eradication of worries, importance of emotional intelligence and auto-suggestions were imparted to the mid-level managers as a part of training programme.
Data collection and analysis: Data was collected through multi dimensional coping inventory developed by Carver et al., (1989) to both the groups before and after yoga training. Data analysis was carried out with the help of SPSS application software version 23 and AMOS version 23.

Results & Implications:

Table 1: Impact of SKY on Problem Focused Coping Style (PFC)

<table>
<thead>
<tr>
<th>PFC Subscales</th>
<th>Experimental group (70)</th>
<th>Control group (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>P value</td>
</tr>
<tr>
<td>Pre_Active coping</td>
<td>15.34</td>
<td>.009**</td>
</tr>
<tr>
<td>Post_Active coping</td>
<td>16.19</td>
<td></td>
</tr>
<tr>
<td>Pre_Planning</td>
<td>15.67</td>
<td>.005**</td>
</tr>
<tr>
<td>Post_Planning</td>
<td>16.50</td>
<td></td>
</tr>
<tr>
<td>Pre_Suppression of competing activities</td>
<td>14.44</td>
<td>.124</td>
</tr>
<tr>
<td>Post_Suppression of competing activities</td>
<td>13.83</td>
<td></td>
</tr>
<tr>
<td>Pre_Restraint coping</td>
<td>13.33</td>
<td>.495</td>
</tr>
<tr>
<td>Post_Restraint coping</td>
<td>13.59</td>
<td></td>
</tr>
<tr>
<td>Pre_Seeking support for instrumental reasons</td>
<td>14.74</td>
<td>.059</td>
</tr>
<tr>
<td>Post_Seeking support for instrumental reasons</td>
<td>15.39</td>
<td></td>
</tr>
<tr>
<td>Pre_Problem focused coping</td>
<td>73.52</td>
<td>.101</td>
</tr>
<tr>
<td>Post_Problem focused coping</td>
<td>75.48</td>
<td></td>
</tr>
</tbody>
</table>

** denotes significant at 1% level

Inference: From the above Table -1, for the experimental group, the mean scores for all the factors except suppression of competing activities show increase in the mean scores after SKY yoga training. But the difference in the mean scores is statistically significant at 1% level only for two factors i.e., active coping and planning. For ‘Active coping’, the mean scores has increased from 15.34 to 16.19 and is found to be significant at 1% level (p = .009 < 1). Similar results are found for ‘Planning’, where the mean scores has increased to 16.50 from 15.67 and p value (.005 < 1) is found to be significant. However, the overall scores for Problem focused coping style, though show increased mean scores from 73.52 to 75.48, after SKY yoga training, is not significant ( p > 0.05).

In the control group, though the mean scores for all the factors show mild increase or decrease after yoga training but overall, the results are not significant (p > 0.05).

Table 2: Impact of SKY on Emotion Focused Coping Style (EFC)

<table>
<thead>
<tr>
<th>EFC Subscales</th>
<th>Experimental group (70)</th>
<th>Control group (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>P value</td>
</tr>
<tr>
<td>Pre_Seeking support for emotional reasons</td>
<td>13.33</td>
<td>.006**</td>
</tr>
<tr>
<td>Post_Seeking support for emotional reasons</td>
<td>14.16</td>
<td></td>
</tr>
<tr>
<td>Pre_Positve reinterpretation &amp; growth</td>
<td>17.01</td>
<td>.043*</td>
</tr>
<tr>
<td>Post_Positve reinterpretation &amp; growth</td>
<td>17.27</td>
<td></td>
</tr>
<tr>
<td>Pre_Acceptance</td>
<td>15.23</td>
<td>.253</td>
</tr>
<tr>
<td>Post_Acceptance</td>
<td>15.33</td>
<td></td>
</tr>
<tr>
<td>Pre_Religion</td>
<td>14.00</td>
<td>.007**</td>
</tr>
<tr>
<td>Post_Religion</td>
<td>14.86</td>
<td></td>
</tr>
<tr>
<td>Pre_Emotion focused coping</td>
<td>59.57</td>
<td>.001**</td>
</tr>
<tr>
<td>Post_Emotion focused coping</td>
<td>61.61</td>
<td></td>
</tr>
</tbody>
</table>

** denotes significant at 1% level, * denotes significant at 5% level
**Inference:** From the above table – 2, for the experimental group, the mean scores for all the factors of emotions focused coping style has increased except for the factor ‘Acceptance’ where the p value is > 0.05 and hence not significant. For the factors ‘Seeking support for emotional reasons and ‘Religion’, the increase in mean scores from 13.33 to 14.16 and 14 to 14.86 respectively are found to be significant at 1% level after yoga training. For the factor ‘Positive reinterpretation & growth’, the increase in mean scores from 17.01 to 17.27 after yoga training shows that p value (0.43 < 0.05) are significant at 5% level. Moreover, the overall scores for Emotion focused coping showed increase in the mean scores from 59.57 to 61.61 after SKY yoga training and this increase is found to be significant at 1% level.

Comparatively, for the Control Group, the results are not significant. In fact the overall mean scores in Emotional focused coping show a decrease in mean scores from 59.46 to 59 though not statistically significant.

### Table 3: Impact of SKY on Avoidance Focused Coping Style (AFC)

<table>
<thead>
<tr>
<th>AFC Subscales</th>
<th>Experimental group (70)</th>
<th>Control group (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>P value</td>
</tr>
<tr>
<td>Pre_ Venting of emotions</td>
<td>13.46</td>
<td>.002**</td>
</tr>
<tr>
<td>Post_ Venting of emotions</td>
<td>13.21</td>
<td></td>
</tr>
<tr>
<td>Pre_ Denial</td>
<td>10.84</td>
<td>.080</td>
</tr>
<tr>
<td>Post_ Denial</td>
<td>10.44</td>
<td></td>
</tr>
<tr>
<td>Pre_ Behavioral disengagement</td>
<td>10.11</td>
<td>.000**</td>
</tr>
<tr>
<td>Post_ Behavioral disengagement</td>
<td>8.41</td>
<td></td>
</tr>
<tr>
<td>Pre_ Mental disengagement</td>
<td>10.96</td>
<td>.045*</td>
</tr>
<tr>
<td>Post_ Mental disengagement</td>
<td>10.40</td>
<td></td>
</tr>
<tr>
<td>Pre_ Avoidance coping style</td>
<td>45.37</td>
<td>.000**</td>
</tr>
<tr>
<td>Post_ Avoidance coping style</td>
<td>42.47</td>
<td></td>
</tr>
</tbody>
</table>

** denotes significant at 1% level, * denotes significant at 5% level

**Inference:** From the above Table – 3, In the experimental group, except for the factor ‘Denial’, the decrease in scores for the factors ‘Venting of emotions’ from 13.46 to 13.21, ‘Behavioral disengagement’ from 10.96 to 10.40 and overall scores for avoidant Focused coping style is significant at 1% level. For the factor ‘Mental disengagement’ the decrease in mean scores from 10.11 to 8.41 is significant at 5% level (p value - 0.045 < 0.05).

For the control group, the results are not significant and in fact, the overall ‘Avoidance Coping shows increase in mean scores from 45.20 to 46.10, but the increase is not significant.

### Results and Discussion

The 8 weeks Simplified kundalini yoga training on 70 mid-level managers has proved that yoga can impact the coping styles of mid-level managers. Analysis of data has shown that overall problem focused coping mean scores has increased from 73.52 (8.58) to 75.48 (10.04) after yoga intervention but is not statistically significant. The result seems to vary with the research findings of Puymbroeck (2000), Lim, (2008) and Mehrabi et al.,(2012) in which the increase in mean scores of problem focused coping are significant. With regard to emotion focused coping, the increase in mean scores before and after yoga intervention shows increase from 59.57 (7.69) to 61.61(7.12) and is significant (<0.01). The results are contradictory with the findings of Mehrabi et al.,(2012) where there is a significant decrease in emotion focused coping of nurses after yoga intervention. This holds good for the current study because in an IT Organization completion of task within the professional deadline may act as stressor to the employees. Since the respondents in the present study are mid-level managers whose decision making capacity is limited and may not possess the required authority to alter any task or professional deadline, choosing emotion focused coping style by mid-level managers would be more appropriate to overcome
the situation than adopting problem focused coping. As far as avoidance coping focus is concerned, the results from table-3 clearly shows that there is a decrease in the overall avoidance coping from 45.37 (7.93) to 42.47(7.34). The results are significant at 1 % level (<0.01) which are similar to the findings of Mehrabi et al.,(2012). Sometimes individuals tend to adopt avoidant coping style to escape from difficult situations. Though it is advantageous at times, may prove disadvantageous when used in a long run (Carver et al., 1989). Hence this finding has more relevance in the present scenario where stressed people often use avoidance style to escape from the stressor and therefore, it can be concluded that yoga has a significant and positive impact on the coping style of mid-level managers. So, yoga training/workshops should be given due importance in Organizations’ like any other corporate programs to aid corporate employees in adopting effective coping styles. This would enable the Organizations to achieve maximum goals with minimum stress among the employees.

**Suggestions for future research:** Among the various forms or styles of yoga, Simplified Kundalini Yoga (SKY) is used for the present experimental study to explore the impact of coping style of mid-level managers. To what extent other forms/styles of yoga impact the coping style of different respondents and whether the duration of the yoga training programme will have a differential impact on the coping style could be taken as a gap for future research.

**Note:**

1. The total no. of words in the manuscript is 3000 including references.
2. The references have been converted to Vancouver style and references are quoted in superscript.

**Ethical Clearance:** The bonafide certificate issued by the HTC Global Services, a mail feedback on yoga training program from Human performance coordinator and sample photographs are attached for your reference.

**Source of Funding:** Basically, I am a Simplified kundalini yoga trainer and completed my masters in yoga from the University of Madras. Simplified Kundalini Yoga practice has enhanced both my physical and mental health. As a token of gratitude, the entire training programme was self funded. I spent more than Rs.30,000/- for the training session which includes payment to the World Community Service Centre and Rs.15000/- to the volunteers (25 sessions x average of 6 volunteers per session x Rs.100 per head).

**Conflict of Interest:** NIL

**REFERENCES**


Role of Oral Appliances in Obstructive Sleep Apnea as a Treatment Modality

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Abstract
Mandibular repositioning splints (MRSs) and continuous positive airway pressure (CPAP) are used to treat the sleep apnea/hypopnea syndrome (SAHS). There are some data suggesting that patients with milder symptoms prefer MRS, but there are few comparative data on outcomes. The main morphological feature of OSA is upper airway narrowing during sleep, which is associated with snoring, excessive daytime sleepiness, hypertension, increased risk of cardiovascular diseases etc. Some evidence links OSA to an increased risk of mortality but the pathogenesis of this relationship is still not entirely clear. It has been postulated that upper airway dilator muscle activity is crucial for counter-acting the negative intraluminal pharyngeal pressure. Diminution of this activity during sleep is the major reason for pharyngeal collapse and obstruction in patients with obstructive sleep apnoea.

Keywords: Obstructive sleep apnea, Oral appliance, CPAP, Mandibular advancement device

Introduction
Obstructive sleep apnea is due to repeated arousals during sleep. Day time sleepiness is one of the characterized by pauses in breathing during sleep, micro-arousals and daytime sleepiness. These symptoms are caused by repeated episodes of obstruction at one or more upper airway levels during sleep.

Oral appliances that advance the mandible forward during sleep have been suggested as an appropriate and non-invasive treatment for mild to moderate obstructive sleep apnea. The purpose of this article is to create awareness about the efficacy of mandibular advancement devices as a treatment for mild to moderate obstructive sleep apnea¹. There has always been increase in the interest of knowing about the sleep apnea. OSA is characterized mainly by the recurrent complete or incomplete upper airway obstruction which makes difficulty to breathe. OSA is a sleep disorder which shows symptoms such as irritability, neurocognitive deficits, snoring, daytime tiredness, frequent awakening from sleep, depression in adults². The prevalence of OSA is reported to be around 2% for women and 4% for men³, wherein 3% to 12% of the total world population is affected by habitual snoring⁴,⁵.

The OSA is mainly caused by collapse of upper airway that leads to upper airway constriction. The three major areas of obstruction include: the nose, palate, and hypopharynx. Additional factors that may contribute this collapse include: soft tissue hypertrophy, obesity, and craniofacial characteristics such as retrognatia⁶. anatomical abnormalities are not always the main causative factors leading to OSA and in fact, in some cases, the etiology can be due to failure of the central nervous system to signal the pharyngeal dilator muscles to dilate and maintain an open pharynx . Environmental and genetic factors related to obstructive sleep apnea are, increasing age, family history, obesity, ethnicity, alcohol, smoking, and cranio-facial abnormalities and nasal obstruction⁷.

Diagnosis and Treatment of Osa: The diagnosis of OSA requires the combined assessment of relevant
clinical features and the objective demonstration of abnormal breathing during sleep. Subjective and objective diagnostic aids are present which are useful in diagnosis of OSA. Subjective assessment includes stop bang questionnaire, Epworth’s sleep scale and Stanford sleepiness scale (SSS). Objective assessment include polysomnography, MSLT (multiple sleep latency test), cephalometry, anthropometry and demographic patterns.

Treatment Options: Weight reduction is expected to ameliorate some of the risk for co-morbid conditions like CAD, hypertension, metabolic syndrome. Both sedative medications and alcohol have a depressant effect on the pharyngeal dilator muscles and increase respiratory resistance, aggravating OSA.

A number of agents have been tried without success to ameliorate the excessive somnolence in OSA patients. The US FDA has approved the use of the wake promoting drug modafinil in improving alertness and subjective and objective sleepiness in patients with OSA.

Therapy with CPAP is the first-line treatment for OSA. Giles TL in 2006 stated that it delivers air at high flow (20-30 liters/min) through an interface to the upper airway, providing a constant mechanical splint (air at pressure) to prevent airway collapse during sleep, thus abrogating apnoeas and hypopnoeas. This reduces intermittent hypoxia, respiratory effort, sympathetic stimulation arousals and sleep fragmentation.

The CPAP provides similar inspiratory and expiratory pressures, however, in BiPAP the inspiratory positive pressure, (IPAP) is set to prevent upper airway closure and hypopnea due to partial closure. The expiratory positive airway pressure (EPAP) serves to stabilize the collapsible airway at end expiration such that the patient can comfortably trigger the delivery of an IPAP. It provides ventilatory assistance with improved patient compliance. It can be particularly helpful in patients with high CPAP pressures and underlying lung diseases compromising oxygen transfer or increasing the work of breathing.

The US FDA approves 16 devices for use in sleep apnoea. Oral appliances (OA) are now widely used as an alternative to CPAP therapy. They are designed to keep the upper airway open by either advancing the lower jaw forward or by keeping the mouth open during sleep. A recent meta-analysis found that OA should not be considered as the first-choice therapy for OSA, where symptoms and sleep disruption are severe. Although CPAP was clearly more effective at reducing the disruption to sleep, some people with OSA may prefer using OA if they are found to be tolerable and more convenient than CPAP. When an active OA compared with an inactive OA, there were improvements in daytime sleepiness and apnoea/hypopnoea severity. Also, OA may be more effective than corrective upper airway surgery.

Continuous positive airway pressure provides at best a control for OSA. It is surgery alone which can provide a “cure”. However, the role of surgery requires proper patient assessment and selection and is not for everyone. Uvulopalatopharyngoplasty (UPPP) is the most common surgery performed for snoring. It has been shown to decrease OSA severity, more so in patients with retro palatal obstruction. This surgical procedure has an approximately 52.3% rate of long-term reduction of respiratory disturbance index (RDI) or AHI of greater than 50% of patients with mild or moderate sleep apnoea. Site-specific surgery, including maxillomandibular advancement, has been shown to effective selected patients with certain anatomical abnormalities.

Oral appliance (OAS) were introduced as a treatment for OSA in the 1980s and continue to be used both as a primary therapy and for patients unable to tolerate PAP. They function by moving the mandible, tongue, and attached structures within the mouth and throat forward; thereby opening the airway space. The appliance function on the same principle as that used in the jaw thrust maneuver of cardiopulmonary resuscitation (CPR) to open the airway. Efforts to improve the efficacy of OA therapy have centered on varying how different appliances establish jaw protrusion. Most oral appliances for the treatment of obstructive sleep apnea are fabricated in a dental laboratory on custom stone models of the patient’s upper and lower teeth that are attached to a dental articulator; a machine that reproduces the spatial relations between the maxilla and mandible.

There are two groups of oral appliance treatments available; mandibular advancement devices (MAD), which are attached to the teeth and maintain the mandible in a protruded position, and the tongue retaining device which retains the tongue in anterior position and does not allow it to fall backwards which can obstruct airflow. MADs appliances are more commonly used than the other. Mandibular advancement appliances are of two types; they are the two-piece appliance and monoblock.
Both of these devices are designed to keep the mandible in a protruded and inferior position, consequently widening the pharynx in an anterior-posterior dimension, but even more so in the lateral dimension. The amount of mandibular protrusion depends on the anatomy of the individual and it may require a titration procedure, until the good results are achieved.

Thornton Adjustable Positioner (TAP-3) is an design approved by the Food and Drug Administrations for the treatment of OSA. It is essentially two custom fit mouth guards (one for the top teeth and one for the bottom) with an attachment and adjustment mechanism that connects along the anterior portion of each mouth guard. This adjustable mechanism is set to advance the lower jaw until the airway space behind the tongue is open enough to alleviate symptoms of OSA. The TAP-3 appliances contribute to patient comfort because, unlike many OA designs, it allows some freedom for lateral movement of the mandible.

Mandibular advancement device: In a review article, Lowe states that there are about 55 different oral appliances currently (2000) on the U.S. market, but only 14 have received market clearance by the FDA (Food and Drug Administration) for both snoring and OSAS. Although there are many different types of oral appliances, the mandibular advancement technique appears to be the most efficacious and is well tolerated. Different designs of these MAAs are available today: they include prefabricated and individually designed one-piece (monoblock) or two-piece appliances. However, the purpose of each of these appliances is the same. They should be inserted intraorally at night to displace the position of the mandible anteriorly with the aim of enlarging the retroglossal space. Moreover, this treatment mechanism thereby tenses the palatoglossal and palatopharyngeus muscles and thus reduces the degree of upper airway obstruction and pharyngeal collapse have shown that oral appliances change the volume of the upper airway; the augmentation of upper airway muscle activity and fewer nocturnal desaturations.

In a review article in 2001, Lindman and Bondemark found that the majority of the 30 reviewed studies still had few patients included and the follow-up time was short and without any control. In overall terms, the mean normalization rate (AHI<10) in these studies was 61%. It is important to note that these studies included patients with every degree of severity of OSAS. When distinguishing mild to moderate OSAS from severe, different normalisation rates are found. Patients with severe OSAS had less reduction in apneas (49%) than patients with mild to moderate OSAS (70%).

In recent years, some studies have been conducted with a randomized crossover design but only for short-term periods. These studies were conducted with either a randomized placebo-controlled crossover design or a randomized crossover design comparing dental appliances with CPAP

Clinical efficacy of MAD treatment: The American Sleep Disorders Association (ASDA) reviewed the available literature in 1995 and recommended that oral appliance should be used in patients with primary snoring or mild OSAS and in patients with moderate to severe OSAS who are intolerant of, or refuse treatment with, CPAP. One of the difficulties when is comes to comparing treatment results in different studies of MAA is the huge variety of designs of these appliances. However, since the overall aim is to advance the mandible, generalization maybe possible and it appears that, the greater the degree of advancement (achieved by gradual adjustment), the better the outcome. This fact may be related to a dose-dependent enlargement of the upper airway, the augmentation of upper airway muscle activity and fewer nocturnal desaturations.

OSAS had less reduction in apneas (49%) than patients with mild to moderate OSAS (70%).

In a randomized controlled trial, patients with mild to moderate OSAS found to be less effective than CPAP. However, the patients reported more side-effects with CPAP and generally expressed greater satisfaction with the oral appliance treatment. MAA appears to be an effective therapy for treating persistent apneas in patients who fail UPPP.

There is lack of reports about the patients who will benefit from MAA treatment. A number of cephalometric predictors have been used when treatment success is described; a retrognathic mandible together with a prognathic maxilla, high position of the hyoid bone,
relatively normal post-palatal and post-lingual airway and narrow tongue base\textsuperscript{23}.

Almost none of the studies evaluating the treatment effect of MMA have investigated the effect on the clinical symptoms related to OSAS. However, some studies reported fewer headaches and reduced day time sleepiness evaluated by the Epworth Sleepiness Scale and improvements in psycho-intellectual function\textsuperscript{6}.

**Patient Compliance:** After one year of treatments, 75-86\% of the patients continued to use their appliances\textsuperscript{14} In more extended follow-up studies, Yoshida noted 90\% compliance after a mean follow-up of about two years (range 6 to 59 months)\textsuperscript{24} and Menn et al. noted 70\% compliance after 3.4 years of use.

**Adverse Effects:** The most effective degrees of mandibular advancement for each individual patient is not well understood, although it has been reported that the maximum protrusion of the mandible produces the greatest airway enlargement\textsuperscript{23}. However, the maximum forward mandibular position is not appropriate as it cause temporomandibular joint pain, or masticatory muscle discomfort.

Minor side-effects and complications after treatment are reported by patients in several studies\textsuperscript{25} Increased salivation, dryness of the lips and throat and slight tenderness in the teeth and jaws after awakenings were the most commonly reported symptoms.

**Conclusion**

Mandibular advancement is one of the best treatment modality in cases of obstructive sleep apnea unless there is strong contraindication with respect to the treatment plan. Mandibular advancement device has been recommended for the treatment of mild to moderate sleep apnea in AASM guideline.

**Ethical Clearance:** Not Applicable

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**Conflict of Interest:** Nil

**References**


An Examining Approach to Exploring the Philosophy of Life
to the World Religion-Case Study

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ABSTRACT

Human lives in present scenario, all over the world faces lots of some problems, they are common in our
daily life. In Today’s world, Education has brought high distinction in various aspects of life. Every human
born with inherent physical power and mental ability in good order to understand and use them perfectly to
lead a life. The most important things for us to understand clearly and completely is about the philosophy
of life, Law of Nature, consciousness, its origin and end through the light of inner vision, realization of Self
and actualization of Truth blossom fully in the higher state of consciousness.

Keywords: Philosophy, Consciousness, Self-actualization, enmity, Morality, Charity

INTRODUCTION

Generally, Human beings is facing some sort of problems in day to life. It would be extremely accepted
by one and all. But it would be so readily subscribed to statement that there are solutions for all the problems we
are facing. Proper solution is easily and quickly available for clear-minded persons of deep thinking[1]. For others,
however, pains and miseries will flow from every problem. Unlike other living beings, man is a peculiar
phenomenon of dual might, with Nature and Will in constant combat, one striving to overcome the other.
With all other living beings, Will is subdued by Nature; and in their case, there is no conflict between Nature and
Will. Will functioning in harmony with Nature is known as instinct. Generally, a man Will is very powerful and
always tries to overcome Nature[2]. Will registers success and failure every now and then in its zeal and actions.
Until perfection is achieved by experience in accurately

assessing the relative strengths of Will and Nature, possibilities of failure would be there in every zeal or
action, in the perspective view of time, place and object of contact. In its effort to subdue Nature, Will creates
more problems in life by wrong approach. Even through there are solutions to all problems, the intervening period
between problem and solution will be one of trouble and disturbance to the body and the mind[3-4].

Philosophy of Life: The philosophy of life is takes to research about the relationship between an individual
and society. When a man protects himself from the natural pains for his survival and lives in harmony with
society, happiness blossoms. If one attains the realization of Divine, love and compassion multiply towards fellow
human being. One can see the whole world filled with peace and happiness.

Philosophy of life is a total perspective knowledge which includes all the universal secrets[5] This can be
easily understood by all and it would be used to all facts of life. This philosophy of life is defined by Saint Vethathiri
Maharishi says, “To lead a life with the knowledge of philosophy of life is like living in a well-lit house”. If
we try to climb a dark stair -case, we may put our leg not knowing where actually stepping in. We are likely to
stumble down. When there is light we can see the steps well and climb without any trouble. Leading one’s life

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understanding the philosophy of life is similar to this. The philosophy of life is the very light of life [6].

The philosophy of life consists of twelve basic principles of life. It is sub-divided into four major groups and each group consists of three subgroups with explanations. These principles comprise three needs, three protections, three virtues and three stages in the development of knowledge.

For body - three needs
For life force - three protections
For society - three virtues
For nature - three stages in development of knowledge or Consciousness

Three Needs: There are three basic needs for all living beings. These are natural urges.

i. Needs to satisfy Hunger and thirst
   ii. Needs to make Adjustment to climatic variations
   iii. Needs to relieve Pressure of excretory forces

From the time of birth until death these three needs will important thing arise in man’s life. These are essential for man’s survival too. These urges must be balanced with proper commodities and facilities.

Three Protections: The three essential protections are:

   i. Protection from natural disasters
   ii. Protection from the enmity of other living beings
   iii. Protection from accidents

Protection From Natural Disasters: Earthquakes, eruption of volcanoes, cyclones, drought, flood and tsunami are some common disasters that the world experiences on now days. Man needs protection from them to lead a fear-free, peaceful life [11].

Protection From the Enmity of Other Living Beings: Enmity with another person is mostly related to food and protection. There may be some other reasons also like jealousy and social customs. Because of this enmity they mutually hate one another and inflict pain on others [12]. Everyone needs protection from the enmity of other living beings. Everyone needs protection from the enmity of other living beings.

Protection From Accidents: When we move from any place to the other, unfortunately we may face accidents unexpectedly due to unforeseen circumstances [13]. We need protection from these accidents. On one’s own planned activities there may be interference from other’s planned activities and accidents happen due to unforeseen circumstances. That will lead to affect one’s life. We need protection from these accidents created by circumstances. Wearing helmet protects one’s life during driving a Two-wheeler.

Three Virtues: Man has a habit of living in a group called society. He cannot change this and cannot think
of living alone like animals. One man’s effort or labour or intellect is not enough to produce all the articles and facilities required for his life [14]. He has to live in a society to get all his requirements. Therefore, man has some more responsibilities.

Three important virtues are:

i. Morality, ii. Duty, iii. Charity

**Morality:** One should restrict one’s thought, word and deed so that they may not result in pain to self or to others, to the body or to the mind, at present or in future[15]. This is morality.

Propriety of conduct leads to eminence; it should therefore be preserved more carefully than life.

**Duty:** Everyone lives in a society. He is given birth, reared, educated, granted position and protected only by the labour, intellect, love and care of the society. Society contributes for individuals to grow and individuals contribute for the society to grow [16]. At any point of time one cannot live alone. So, we are indebted to society. Every minute the dues are increasing. We have to repay these dues to the society in the form of good deeds. With a sense of gratitude and at the proper age, we should return these dues through our labour and love. Only then prosperity, harmony and peace will be maintained in society. This return of dues to society by way of labor and love is called duty:

**Charity:** When one, out of love that is beyond prejudice, unconditionally sacrifices all or a portion of one’s physical labour, intellectual talent or wealth, to help others, that is charity [17]. There is no expectation and no due but one has to do an act as sacrifice. Such a meaningful sacrifice is charity.

**Three Stages in Development of Knowledge:**

(i) Faith

(ii) Understanding

(iii) Realization (Perfection)

These are to be followed by all people according to their individual capacities.

**Faith:** Faith is the first stage in development of knowledge. Under this system those who are not capable of understanding the principles of life, either because of youth or because of underdeveloped intelligence, should lead their lives by faith [18]. They should obediently follow the teachings of wise men and elders with sufficient experience who are their guides or guardians. This is called ‘Bakthi Yoga’[19].

**Understanding:** Understanding is the second stage in development of knowledge. When one comes to the age of understanding and thinking faculty is developed, he understands the values of virtues. If one starts thinking on his own and analyzing, his intelligence is developed. He leads his life by understanding [20]. He follows the principles of life by learning from his own life experiences, by studying books, and by learning from lectures of experienced persons.

**Realization (Perfection):** Realization is the third and final stage in development of knowledge. This is called as actualization. All the understanding should be put into practical experience. One has to develop his knowledge to the fullest to make the life purposeful. When one understands clearly and completely the philosophy of life, philosophy (laws) of Nature, consciousness, its origin and end through the light of inner vision, realization of Self and actualization of Truth blossom fully in the higher state of consciousness [21].

**CONCLUSION**

For better living, the understanding of the above-explained twelve principles of life is imperative for all sections of people in the human society. These twelve principles of life are the essence of the Vedas and the core and goal of all the Religions in the world. The important of Science, Politics and Economics, are also having their roots only in these twelve principles of life. Knowingly or unknowingly, from time immemorial, only some people have understood and are following these twelve principles of life. The majority are not even aware of the existence of these principles. The result is that miseries and problems are increasing day by day in the human society all over the world. The time has come now for all people to understand these principles and follow them in their life. Leaders and publicists in all over the world are stressing the need to provide universal education. If these twelve principles are elaborated and taught properly to all the youngsters by methods suitable for the respective age-groups and levels of understanding, the purpose of education will be achieved. This itself will be real spiritual education. Philosophers, Scientists, Jurists, Educationists and Administrators should take
up unitedly the responsibility mankind through an international organization. All Governments, religious institutions and philanthropic people should cooperate and provide the required financial support. The Sciences have been developed to impressive proportions and material prosperity is more than enough. Only the spiritual development is required to the world people to attain peace in life with harmony. Further enhancement of research on the life of mankind and with all the responsibility and sincerity would be concentrated in all around the countries. It leads in giving fruitful and fulfilling all the basic needs and principles for a comfortable and peaceful life of mankind.

Ethical Clearance: Taken from publication committee
Source of Funding: Self
Conflict of Interest: Nil

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Analysis of Quality Assurance on Health Development of Hajj Pilgrims in Bojonegoro District

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Abstract

Background and Objectives: Hajj is worship that has very complex implementation. Hajj pilgrims are required to have a good health condition or it usually called istithaah. Indonesian hajj pilgrims with high risk categories of 46-67% caused high morbidity and mortality of hajj pilgrims. If no effort is done in order to establish and improve the health status of hajj pilgrims during the preparation period at the Primary Health Care (Puskesmas). Research about the analysis of quality assurance of health development of hajj pilgrims at Primary Health Care in Bojonegoro District with a reference to Health Minister’s Regulation No. 15 of 2016 about Health Istithaah needs to be done to improve health services of hajj pilgrims in the Primary Health care before departure. Method: This study was conducted in March to April 2018. The data used in the study were primary data that collected by conducting an indepth interview with the officers of Hajj Medical Checkup Team (TPKH) at Primary Health Care in Bojonegoro District. The population in this research is the officers of TPKH in Primary Health Care that perform service at hajj pilgrims. The inclusion criteria of the study were TPKH officers serving high risk hajj pilgrims. The sample consisted of TPKH officers in 17 Primary Health Cares taken by simple random sampling method. This study used questionnaire instrument indepth interview guides. The questionnaire consisted of questions about the health development of hajj pilgrims conducted at the Primary Health Care. The questions are in line with the Technical Guidelines of Health Minister’s Regulation No. 15 of 2016 on Health Istithaah. Interpretation: The results of the study indicate that 100% of Primary Health Care in Bojonegoro District have not conducted a health development on waiting period for hajj pilgrims who will leave with a two-year estimate, 65% of Primary Health Care do not conduct hajj health care with home visits, and 71% Primary Health Care do not conduct hajj health education by disseminating information through printed media (leaflets, brochures, and posters). Efforts to improve the health development of Hajj pilgrims need to be done by Primary Health Care to run in accordance with the rules and provide maximum results in efforts to establish and improve health istithaah of hajj pilgrims.

Keywords: Health hajj pilgrims, health development, Primary Health Care.

Introduction

Hajj is the fifth pillar of Islam which is a lifetime obligation for every Moeislem who is able to fulfill it.

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The fifth pillar of Islam has a special characteristic that is largely physical activity, for a long time (38-40 days), and is done in the month of Dhu al-Hijjah in Saudi Arabia. The implementation of the complex pilgrimage requires the prospective hajj pilgrims in a state of health that usually called istithaah.

Indonesia is the country with the largest number of hajj pilgrims in the world. In 2017 the number of Indonesian hajj pilgrims amounted to 221,000 people. Indonesian Hajj pilgrims is classified as having high
health risks. The percentage of high risk hajj pilgrims in Indonesia in the last five years ranged from 46-67%. The death of Indonesian hajj pilgrims is also relatively high at around 200-330 for each 100,000 hajj pilgrims. Embarkation of Surabaya is an embarkation with the highest number of hajj pilgrim deaths in 2017. Embarkation of Surabaya serves hajj pilgrims from East Java (96%), Bali (2%) and East Nusa Tenggara (2%).

Based on data collected from Siskohatkes (Information System and Computerized Hajj Integrated Health) it is known that Bojonegoro District is one of 38 District or city in East Java with the number of deaths of high risk hajj pilgrims above the general indicator standard since 2015 to 2017. The proportion of death of high risk hajj pilgrims in Bojonegoro District since 2015 to 2017 has the average 7‰ (general indicator of hajj health services is less than 2‰).

The fact that the high mortality rate of hajj pilgrims in Bojonegoro District is a matter that deserve further analysis. The risk of individuals to experience death during the pilgrimage can be influenced by many factors, one of which is the health care factor. Efforts or activities that can be done in order to establish and improve the istithaah health status of hajj pilgrims in health care facilities through health coaching. With reference to the problems above, the purpose of this study is to analyze the quality of health development hajj pilgrims in Primary Health Care Bojonegoro District with a reference to Health Minister’s Regulation No. 15 of 2016 about Health Istithaah.

### Material and Method

The research design used in this research is cross sectional with qualitative descriptive approach which describes the phenomenon that occurs by developing the concept and collecting facts. The study was conducted retrospectively by conducting an assessment of the examination activities and health development of hajj pilgrims in 2017. The study was conducted in March until April of 2018. Data used in the study were primary data. Primary data was collected by conducting an indepth interview with officer of Hajj Medical Checkup Team (TPKH) at Primary Health Care in Bojonegoro District. The population in this research is TPKH officer in Primary Health Care that performs service at hajj pilgrims. The inclusion criteria of the study were TPKH officers serving the high risk hajj pilgrims. The sample consisted of TPKH officers in 17 Primary Health Cares taken by simple random sampling method. This study used questionnaire instrument indepth interview guides. The questionnaire consisted of questions about the health development of hajj pilgrims conducted at the Primary Health Care. Questions are tailored to technical guidelines Health Minister’s Regulation No. 15 of 2016 about Health Istithaah.

### Findings

Istithaah Health Hajj pilgrim is defined as the ability of the hajj pilgrims from health aspects including measurable physical and mental with the examination and guidance that can be accounted, so the hajj pilgrims can perform their worship according to the guidance of Islam. The effort of examination and promotion of hajj health in order to achieve health istithaah is done through a series of activities to prepare the condition of the ability of the hajj pilgrims through standard mechanism on continuous standardized health service facilities. Stages of examination and health development hajj pilgrims in Bojonegoro is based on Health Minister’s Regulation No. 15 of 2016.

Based on the results of the first phase of medical checkup conducted at Primary Health care, it is known that 48.76% of pilgrims in Bojonegoro District in 2017 are included in the high risk category. The results of the second phase examination also illustrates that there are still 20.31% of hajj pilgrims who qualify health istithaah with assistance. The high number of high risk hajj pilgrims and istithaah with assistance should demand the service providers in Primary Health Care to provide esktra health development to the hajj pilgrims.

The health development given to the hajj pilgrims at the Bojonegoro District Health Center in 2017 can be seen in table 1.

### Table 1. Health Development at Primary Health Care Bojonegoro District in 2017

<table>
<thead>
<tr>
<th>Variables</th>
<th>Done</th>
<th>Yes</th>
<th>No</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health development is implemented in an integrated manner with other health programs</td>
<td>15 (88)</td>
<td>2 (12)</td>
<td>17 (100)</td>
<td></td>
</tr>
</tbody>
</table>
Based on the result of the research, it is known that most (88%) of Primary Health Care in Bojonegoro District run health development with an integrated manner with other health program. Integrated Primary Health Care program such as mental health, sports health, infectious diseases, nutrition, and counseling. All (100%) Primary Health Care in Bojonegoro District have not run the waiting period in the hajj pilgrims who will depart in two years estimation.

Health development for Hajj pilgrim can be grouped into two kind. First is hajj health coaching and hajj health education according to Table 2.

### Table 2. Method of Health Development at Primary Health Care on Bojonegoro District in 2017

<table>
<thead>
<tr>
<th>Method of Health Development</th>
<th>Done</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hajj Health Coaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counseling</td>
<td>15 (88)</td>
<td>2 (12)</td>
</tr>
<tr>
<td>Dissemination of information through printed media (leaflets, brochures, and posters, etc.)</td>
<td>5 (29)</td>
<td>12 (71)</td>
</tr>
</tbody>
</table>

Source: Primary data, 2018

The most common method of health development by Puskesmas in Bojonegoro District is by counseling and fitness exercise. Few puskesmas are running home-visit methods due to limited manpower.

### Discussion

The results illustrate that all Primary Health Care have not run health development waiting period in the hajj pilgrims who will depart in two years estimation. Primary Health Care generally conduct health development on waiting period about 3-8 months before departure. The implementation of such a short period of coaching is due to not yet the implementation of the first stage of health checks according to the rules.

The first phase of medical checkup was performed by the hajj pilgrims when they registered first time to obtain a portion number. The results of this first stage examination will be the basis of the implementation of health development that aims to fix and improve the health condition of hajj pilgrims. Therefore, the first phase medical checkup is a must for every hajj pilgrim to be done early (at least two years before the estimated departure).

Based on the results of indepth interviews with respondents, it is known that the obstacle such as first phase medical checkup and health development on waiting period has not been done according to the regulation. It can be caused by several things such as data provided by the Ministry of Religious Affairs is the estimated data of hajj pilgrims departing in the current
year. Every year there are always hajj pilgrims quota filler that has not been fulfilled and the reserve quota determined in very short time\textsuperscript{13}.

Use of appropriate health development methods should be considered as it will affect the outcome. The results shown that at the phase of hajj pilgrims counseling of 65\% Primary Health Care do not make home visits on hajj pilgrims. Periodic home visits serve to counsel hajj pilgrims including empowering their families. Home visits are also aimed to obtain more information about health risk factors on hajj pilgrims and indications of medical action that do not allow pilgrims to visit health facilities\textsuperscript{4}. Home visits are very important in later on Hajj with a high risk status and qualify with assistance to monitor the health condition.

Dissemination of information through printed media (leaflets, brochures, posters, etc.) is not implemented in 71\% of Primary Health Care in Bojonegoro District. Health education counseling can provide significant results in knowledge improvement. Nevertheless, counseling with printed media needs to pay attention to the benefits and effectiveness of its use to the target and extension workers, because printed media that less attractive will be less attention by the reader and also cost much in the production. Printed media will be effective if it has an attractive image with easily understood language by the target group\textsuperscript{3}.

**Conclusion**

Based on the results of this study, the following conclusions are obtained: 100\% of Primary Health Care in Bojonegoro District have not conducted a waiting period for the pilgrims who will leave with a two-year estimate, 65\% of Primary Health Care do not conduct hajj health care with home visits, and 71\% Primary Health Care do not conduct hajj health education by disseminating information through printed media (leaflets, brochures, and posters, etc).

**Conflict of Interest:** The authors report no conflict of interest.

**Source of Funding:** Self

**Ethical Clearance:** The study was approve by the Health Research Ethics Committee of the Faculty of Public Health Airlangga University

All subjects were fully informed about the procedures and objectives of this study and each subject prior to the study an informed consent form.

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Correlation between Employees’ Quality of Work Life with Turnover Intention at Holding Hospital

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Kampus C Unair, Surabaya, East Java, Indonesia

Abstract

High employee turnover rates are very problematic especially in private hospitals. Many studies on the quality of work life (QWL) relationship on nurses turnover intention (TOI) were found, but the study on all types of clinical personnel and from the perspective of holding hospital are limited. This study aimed to analyze the correlation between QWL of health workers with their turnover intention at P Group Hospital and determine whether there were differences of QWL and TOI in the three hospitals that applied the same policy in human resource management. This study was conducted cross sectionally involving 255 respondent, using standardized questionnaires. Sampling technique was stratified random sampling. Data were analyzed using descriptive statistics, Mann-Whitney, Kruskal-Wallis, and Spearman correlation test. The results showed a significant correlation between QWL and TOI, with negative direction (correlation coefficient -0.344), which means the higher the QWL, the lower the TOI. There were significant differences in QWL levels and TOI in the three hospitals, but the same thing was that all hospital employees least satisfied with growth and security dimension. The conclusions were that QWL was correlated with TOI, and even under the same policy of human resources management, employees’ QWL level and TOI at different hospital can varies each other.

Keywords: Quality of work life, Turnover intention

Introduction

Turnover is the process by which employees leave an organization and must be replaced.(1) High employee turnover rates are very problematic especially in private hospitals. No national data on hospital employee turnover figures in Indonesia, but some references indicate that hospital employee turnover rates in the period 2008 to 2015 were vary between 8.7%-20.3%.(2)(3)

High turnover among employees in health services and other services related to human services is a serious problem,(4) leading to company inefficiency,(5) affecting team instability, lack of knowledge and skills of the new employee, long-term job vacancy,(4) and for the remaining employees there will be an increase in workload, lower motivation,(5) lower job satisfaction, and increased stress.(6) All of these adversely affect the continuity and quality of service, patient safety and satisfaction.(4)(7) Overall, turnover provides negative implications for organizational performance and loss of human and social capital.(8)

Some of the causes of voluntary turnover are dissatisfaction in employment, salary and profit levels, supervision, geography, personal reasons, stress,(9) and career opportunities elsewhere.(1) A conducive working environment is very important to reduce the desire to quit work.(10) Various studies had shown that QWL, defined as employee satisfaction with working life,(11) was significantly related to TOI,(11)(12)(13) job satisfaction,(14) absenteism,(15) and productivity. (16) QWL development was intended to help balance work with the needs, interests and pressures faced by employees, so it can be useful for improving productivity and reducing turnover.

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P Group Hospital is a holding hospital in Indonesia that consisted of 3 Hospitals with same human resource management policy. Its turnover rate in the period of 2016 to 2017 was high (13%), dominated by voluntary turnover of clinical personnel. According to Gillis (1994) employee turnover is said to be high if more than 10% per year. Analyzing the turnover level of the three hospitals is important to find appropriate correction action. The main purpose of this study was to analyze the correlation between QWL with TOI of health workers at P Group Hospital and determine whether there were differences in the level of QWL and TOI in the three hospital.

**Material and Method**

This study was a quantitative research, conducted cross sectionally in February 2018, at three hospital named PGH, GHH, and PGDH. The population were 470 clinical personnel with 225 sample. Inclusion criteria were doctors, nurses, and other health professional who were employees, and had been working there for at least 2 week at the time this study conducted. Specialist doctors, non-employee and employee who had worked less than two weeks were excluded.

QWL was measured using a standard questionnaire adapted from Walton’s QWL model that had been proven valid and very reliable (cronbach alpha 0.96), consisting of total 35 questions and 8 dimensions: adequate and fair compensation (4 item), safe and health environment (6 item), development of human capacities (5 item), growth and security (4 item), social integration (4 item), constitutionalism (4 item), the total life space (3 item), and social relevance (5 item). TOI was measured using a questionnaire consisting of a total of 10 questions with Cronbach’s Alpha value 0.94. All the scale was 4 points Likert scale (4 = strongly Agree, 1 = strongly disagree).

The data were analyzed using SPSS version 21.0 for windows. Descriptive analysis was used to show respondent characteristics, QWL’ level and TOI. For the overall QWL interpretation, the scores on each question were summed and then divided by number of question. The possible score was varied between 1 and 4. The total score ≤2.5 was included in the low QWL category, while the total score > 2.5 was high QWL. Each dimension of QWL was evaluated in the same way.

Mann-Whitney test and Kruskal-Wallis test were used to compare the TOI based on respondent characteristics. Comparison of QWL and TOI among three hospital were analyzed using Kruskal-Wallis test. Correlation between QWL and TOI was analyzed using Spearman correlation test. All significance values were set at p <0.05.

**Findings**

**Respondent Characteristics**

The majority of respondents were women (64.4%), young age between 20-30 years (72.9%), worked in shift (77.7%), had work of tenure between 4-10 years (38.2%), and income under regional minimum wage in this city (40.4%). Respondents consisted of nurses (56.9%), doctors (8.4%), and other health professional (34.7%). Permanent employees were almost in the same amount of contract employees (50.7%). It is shown in table 1 Hospital Employees’ TOI

**Table 1. Mean score of TOI based on respondent characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
<th>TOI</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>80 (35.6)</td>
<td>2.10 (±0.49)</td>
<td>0.821**</td>
</tr>
<tr>
<td>Female</td>
<td>145 (64.4)</td>
<td>2.05 (±0.46)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>164 (72.9)</td>
<td>2.11 (±0.49)</td>
<td>0.020*</td>
</tr>
<tr>
<td>31-40</td>
<td>53 (23.6)</td>
<td>2.00 (±0.35)</td>
<td></td>
</tr>
<tr>
<td>&gt;40</td>
<td>8 (3.5)</td>
<td>1.74 (±0.48)</td>
<td></td>
</tr>
</tbody>
</table>
The comparison of TOI based on respondent characteristics were shown in table 2. The youngest age group of 20-30 years significantly had the highest average TOI compared to other age groups (p = 0.001). Employee with work tenure 1-3 years had the highest intention to leave, while new employee (less than one year) became the second. Contract workers significantly had higher TOI than permanent employees (p = 0.004). Meanwhile, there were no significant differences in sex variables, work rhythm, profession, and income.

The overall TOI was low (2.07). TOI in the three hospitals looked significantly different (p = 0.001). GHH employee had the highest TOI. This is shown in Table 2.

Table 2. Mean score of hospital employees’ TOI at different hospital

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Mean (SD)</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGH</td>
<td>2.03 (± 0.41)</td>
<td>0.001*</td>
</tr>
<tr>
<td>GHH</td>
<td>2.29 (± 0.56)</td>
<td></td>
</tr>
<tr>
<td>PGDH</td>
<td>1.93 (± 0.43)</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>2.07 (± 0.47)</td>
<td></td>
</tr>
</tbody>
</table>

* significant

Hospital Employees’ QWL

The overall mean score of employees QWL was 2.76 (high QWL). Employees at PDGH had the highest QWL’s level (2.87), while GHH had the lowest (2.65) and the differences were significant (p=0.004). It is shown in Table 3.

Table 3 Mean score of hospital employees’ QWL at different hospital

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Mean (SD)</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGH</td>
<td>2.77 (± 0.23)</td>
<td>0.004*</td>
</tr>
<tr>
<td>GHH</td>
<td>2.65 (± 0.30)</td>
<td></td>
</tr>
<tr>
<td>PGDH</td>
<td>2.87 (± 0.27)</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>2.76 (± 0.27)</td>
<td></td>
</tr>
</tbody>
</table>

* significant

Overall, hospital employees reported high score in all QWL dimension, except growth and security. Among three hospitals, QWL’s dimension that significantly different were adequate and fair compensation, safe and healthy environment, growth and, social integration,
constitutionalism, and social relevance. Perceptions of respondents on each of the QWL dimensions at different hospital were shown in Table 4.

Table 4. Mean score of QWL dimension at different hospital

<table>
<thead>
<tr>
<th>QWL dimensions</th>
<th>PGH Mean (SD)</th>
<th>GHH Mean (SD)</th>
<th>PGDH Mean (SD)</th>
<th>Overall Mean (SD)</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate and fair compensation</td>
<td>2.66±0.42</td>
<td>2.51±0.50</td>
<td>2.87±0.42</td>
<td>2.67±0.45</td>
<td>0.000*</td>
</tr>
<tr>
<td>Safe and healthy environment</td>
<td>2.69±0.28</td>
<td>2.54±0.36</td>
<td>2.69±0.37</td>
<td>2.65±0.33</td>
<td>0.040*</td>
</tr>
<tr>
<td>Development of human capacities</td>
<td>2.87±0.30</td>
<td>2.75±0.38</td>
<td>2.90±0.30</td>
<td>2.85±0.32</td>
<td>0.118**</td>
</tr>
<tr>
<td>Growth and security</td>
<td>2.40±0.39</td>
<td>2.40±0.39</td>
<td>2.56±0.41</td>
<td>2.44±0.40</td>
<td>0.018*</td>
</tr>
<tr>
<td>Social integration</td>
<td>2.89±0.36</td>
<td>2.78±0.32</td>
<td>3.18±1.45</td>
<td>2.93±0.76</td>
<td>0.024*</td>
</tr>
<tr>
<td>Constitutionalism</td>
<td>2.79±0.30</td>
<td>2.69±0.43</td>
<td>2.95±0.29</td>
<td>2.80±0.34</td>
<td>0.001*</td>
</tr>
<tr>
<td>The total life space</td>
<td>2.79±0.35</td>
<td>2.77±0.38</td>
<td>2.89±0.33</td>
<td>2.80±0.36</td>
<td>0.208**</td>
</tr>
<tr>
<td>Social relevance</td>
<td>2.99±0.32</td>
<td>2.79±0.33</td>
<td>2.96±0.41</td>
<td>2.94±0.35</td>
<td>0.005*</td>
</tr>
</tbody>
</table>

* significant, ** not significant

Correlation Between QWL with TOI

The correlation between QWL and TOI was analyzed using Spearman’s correlation test. The test result was shown in table 5. There was a significant correlation between QWL with TOI with p value of 0.001 (<0.05). The correlation direction is negative (correlation coefficient -0.344), which means the higher the QWL, the lower the TOI.

Table 5. Spearman correlation test results

<table>
<thead>
<tr>
<th>Variable</th>
<th>TOI Sig.</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>QWL</td>
<td>0.001*</td>
<td>-0.344</td>
</tr>
</tbody>
</table>

*significant

Discussion

Overall, hospital employees in this study reported high QWL score and low TOI. This finding contrary to several other study that reported low QWL and high TOI among healthcare employees.(20)(12)(21) Even though being categorized as high QWL and low TOI, the score was very close to dissatisfaction limit (score of 2.5). Looking at the high trend turnover rate during the period 2016-2017, which was dominated by clinical staff and voluntary turnover, it was still important to analyze and do action to reduce turnover without waiting until turnover rates become too severe. Overall, hospital employees in this study reported dissatisfied with growth and security dimension that consisted of 4 items related to the opportunity of professional growth, trainings given by company, situation and frequency of resignation occurred at the work, and incentive that had been given by company to employee to study.
Company should pay more attention on training programs and employee development, and make sure for creating equal opportunity to get training. Sometimes there is the assumption that if a company trains an employee, then that means the company will only train them for other employers. Developing employee skills will indeed make their market share increase, but will also increase retention. When employees are given training and development, job satisfaction will increase and increase the desire to remain. Creating job security, career development and promotion opportunity were several ways to improved internal labor market that able to make company more competitive and able to retain their staff. The Hospital can follow the regulation of the minister of health of the Republic of Indonesia number 129 year 2008 about the minimum hospital service standards which is stated that the number of employees who get training at least 20 hours per year should meet the standard ≥60%.

Situation and the frequency of employees who submitted the resignation can affect employees. Prior studies stated that turnover occurring to other nurses would lead to a decrease in manpower, which then morally affects, and causes stress from the remaining employees due to an increase in workload. If not well managed, long term high turnover can promote turnover culture among employees. Employees will tend to have TOI if the people around them have the same behavior changing jobs.

These three hospital were managed under the same human resource management policy, but QWL and TOI level were differ significantly. QWL dimensions were not only related to the central human resource management policy, but also with other dimensions in the work environment that differ each other.

There was a significant correlation between QWL with TOI (p = 0.001, coefficient correlation -0.344). The result was consistent with the Almalki study (2012) in primary health care in Saudi Arabia, and study in Iran by Mosadeghrad. Result showed that Youngest group respondents aged 20-30 years old had highest average TOI among others with significant value, consistent with prior studies showing that younger employees had a greater tendency to quit working than older.

Employee with work tenure 1-3 years had the highest intention to leave, while new employee (less than one year) became the second. It was contrary to other study that showed severe turnover among new hire employee. Majority the groups of employee with work tenure 1-3 years were still contract employees with less financial benefit, less clear career path (no guarantee about when a person will be appointed as a permanent employee). In this study, contract workers significantly had higher TOI than permanent employees (p = 0.004), consistent with other study.

Conclusions

QWL was significantly correlated with TOI in negative direction. The higher the QWL, the lower the TOI. Overall employee least satisfied with growth and security dimension. Even under the same policy of human resources management, employees’ QWL level and TOI at different hospital can varies each other. There were significant association between turnover intention with age, work tenure, and employment status.

Policy makers should give attention on increasing QWL as part of management to reduce turnover and increase productivity without having to wait for too high turnover rate, make a comprehensive treatment design by focusing not only on the holding hospital point of view, but also to each hospital, and should give more concern to improve retention of younger employees (age 20-30 years old), new employees until 3 years work tenur, and contract workers.

Conflict of Interest: The authors declare no conflict of interest

Source of Funding: There were no external sources of funding (no sponsor).

Ethical Clearance: This is an original manuscript and is not under consideration by any other journal. All authors approved the manuscript and this submission. The participation in this study was voluntary, anonymous and confidential. All participants had been briefed on the objectives of the study and fulfilled informed consent. All of the protocol had been approved by Health Research Ethics Committee Faculty of Public Health Airlangga University.

References


Development, Validity and Reliability for Motivation of Success to University Inventory

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Abstract

The study aims to build, acquire content validity and reliability of the Motivation of Success to University Inventory (MSUI). MSUI built on the combination of Motivation of Success to University Counseling Model (MSUCM) formulated by Mohammad Aziz Shah (2010) and the approach of Cognitive - Behavioral Therapy (CBT). MSUCM said there are seven strategies that need to be met in the hierarchy in building successful motivation to university; 1) Trigger Self-Awareness (TSA), 2) Build Motivation to Learn (BML), 3) Developing Self Potential (DSP), 4) Setting Life Goals (SLG), 5) Time and Learning Management (TLM), 6) Mastering Study Skills (MSS) and 7) Avoiding Social Problems (ASP). However, CBT explain approaches, concepts, techniques, activities and items in MSUI relationship based on thinking and behavior that affect mood. MSUI contains 70 positive items (10 items for each sub scale) represented by seven sub scale of sub scale 1: Trigger Self-Awareness (TSA), sub scale 2: Build Motivation to Learn (BML), sub scale 3: Developing Self Potential (DSP), sub scale 4: Setting Life Goals (SLG), sub scale 5: Time and Learning Management (TLM), sub scale 6: Mastering Study Skills (MSS) and sub scale 7: Avoiding Social Problems (ASP). Analysis of the content validity derived from nine experts panel from academics and practitioners in counseling psychology. The findings of the overall content validity of MSUI is high which is 88.6, while for the sub scale are TSA (90.1 %), BML (87.2 %), DSP (87.9 %), SLG (86.0 %), TLM (88.1 %), MSS (89.0 %) and ASP (92.2 %). Findings of reliability involving 40 students chosen at random. Data were analyzed using the Statistical Package for the Social Science (SPSS) and Cronbach’s Alpha test showed that all MSUI have the high reliability of .910. The value of each sub scale is also high, TSA (.807), BML (.809), DSP (.770), SLG (.754), TLM (.868), MSS (.750) and ASP (.821). Therefore, the research proves that MSUI validity and reliability. Therefore, this study successfully produced a prototype of the MSUI that can contribute to the development of the construction of psychological assessment instruments, counseling and measurement of motivation among students.

Keywords: Content Validity, Reliability, Motivation of Success to University Inventory

Introduction

Motivation is a topic that is quite popular and attracts the attention of many, especially in the field of education. Education is the most important agenda of the country and has always been a major concern and received a huge budget allocation from the government. This scenario occurs because education is a necessity for every individual. Through the education system, children and adolescents can advance themselves and this not only guarantees their future, but families and communities as well. As a result of these aspirations, many studies have been conducted and most findings show that the success of students to the University is due to the factors of existing self-awareness and motivation. Hence, various efforts and initiatives have been generated to increase
student motivation to achieve the goal of going to the University. Motivation of Success to University Inventory (MSUI) is a new questionnaire in psychology, counseling and education development developed to assess the level of motivation of success in achieving the goals of the University. This MSUI is developed based on a planned and systematic process driven by psychology and counseling in guiding the students to develop awareness, motivation and inculcate the values of excellence driven by the goal of success to University (Mohammad Aziz Shah, 2010). In this regard, the study was conducted to empirically test the validity and reliability of the Motivation of Success to University Inventory (MSUI) by using Cronbach Alpha’s reliability coefficient.

The validity and reliability of the instrument is very important in maintaining the accuracy of the instrument from being exposed to defects. The higher the value and the level of validity and reliability of the instrument, the more accurate the data will be obtained to produce good and quality research. According to Howard and Henry (1988), consistency means that when the same item is tested several times on the same subject at different intervals, the result score or the answer given is equal or nearly equal. It can be concluded that the reliability is sufficient for the determination of validity. Low reliability is considered to limit the degree of validity obtained, but high reliability does not guarantee that a high degree of validity is generated. In short, reliability only provides consistency that allows validity. Normally, the researcher refers to Cronbach Alpha’s reliability coefficient to measure the reliability of the items in each questionnaire. This reliability value is referred to in the commonly used measurement model based on True Score Test Theory (TSTT) or known as a classic model. The validity and reliability of items in a research instrument can also be determined by using the Rasch Measurement Model developed by Rasch (1980). Rasch Measurement Model is a measurement model that is formed because of consideration which take into account on the ability or capability of each candidate or respondent who answered the questionnaire, test or instrument and item difficulty for each test or item (Rasch 1980).

BACKGROUND OF THE DEVELOPMENT OF MSUI

The Motivation of Success to University Inventory (MSUI) is developed to measure the motivation of students to achieve successful aspirations of going to the University. This is a sequence of motivational problems among students. In addition, nowadays motivational aspect is also seen as the main factor that plays an important role in determining the achievement of students in public examinations such as PMR, SPM and STPM. According to Sternberg (2001), motivation means drive or need that leads to action. Motivation also involves a process that gives power and direction that moves one’s behaviour.

Singer (1980) states that motivation is a force that drives a person to achieve a goal and then strives to continue to achieve something more brilliant. Motivation can maintain a goal continuously in a person. However, a good motivation will be a drive and a strong pull for a person to advance. Motivation is also closely linked to the desire to achieve excellence in every effort undertaken (Mohamad Zaaba and Zuraida, 2004). According to them, if a student is encouraged to learn diligently to get excellent results then the student is a motivated student. Among the characteristics of a highly motivated student is that they always want to go early to school, want to go to library, love to read, love to learn and consider the exam as a challenge. Therefore, it is very important for all parties involved with education, especially the school to plan and implement various measures to increase students’ interest and motivation. The school should provide a positive school climate to motivate students to produce effective learning patterns. This is because the school climate is the most important factor in determining the quality of pupils’ learning at school, thus determining the effectiveness of a school.

Education excellence is an important agenda that is often discussed. This is because the future development and advancement of the country depends largely on the educational system and the shape of the student to be produced. In order to improve the quality of this education, more focus should be given to the motivation of the students. This is because students are the nation’s hope in the future. In fact, the teaching process, whether formal or informal, will not be optimum if the student does not have high motivation to pursue knowledge (Stephens and Crawley, 2002).

Therefore, no matter how consistent and solid the educational programs were planned and implemented, they will not achieve full results if the students are not interested and do not have a sense of learning. According to Mohamad Zaaba and Zuraida (2004), although the
attendance of students is quite satisfactory, physical presence does not guarantee mental involvement. Students are seen to fail to take full advantage of the teaching and learning process. This is because many students have no commitment to their studies. Individuals succeed in enhancing their inner motivation when they are aware of the level of motivation they have and are willing to understand and actively participate in motivational programs (McClelland, 1985). This statement proves that awareness of the level of self-motivation plays a big role in raising the level of individual's internal motivation. This motivational issue is very important because motivation will move someone forward in no matter what they do.

Hence, the development of MSUI is believed to be effective and practical to help students reassess their motivation, learning skills and develop goals to the University. Furthermore, students are increasingly challenged with low academic achievement issues, disciplinary problems, social problems and the pressures of meritocracy system.

Research Methodology

The design of this study is a descriptive study. Descriptive research is used to obtain the content validity and reliability value of the MSUI developed based on study literature. This study involved three phases of the study, i.e., Phase 1: MSUI Development, Phase 2: Obtaining Content Validity and Phase 3: Reliability Value Analysis.

Phase 1: Development of MSUI

MSUI is developed based on literature study and based on the combination of Motivation of Success to University Counseling Model and Cognitive-Behavioral Therapy approach. These two theories describe the approaches, concepts, techniques, activities and items in the MSUI based on the relationship of thought that affects feelings and behaviors.

Phase 2: Obtaining Content Validity

In this phase, after MSUI items are developed, MSUI were given to nine experts to review on its content accuracy. The expert is comprised of five academicians with two lecturers in the Department of Psychology and Counseling of Sultan Idris Educational University (UPSI), two secondary school teachers and a secondary school counselor and four others were practitioners of two education officers, a school clerk and a school laboratory assistant. The review by the expert panel is aimed at obtaining the content validity value for MSUI.

Phase 3: Analysis of Reliability

Next, the third phase is carried out to obtain the reliability value of MSUI. After MSUI has obtained the right validity value, it was administered to 40 secondary school students. A simple random sampling method was used for sample selection. The data findings were analysed using SPSS to get the Cronbach Alpha value to evaluate the reliability of MSUI.

The study subjects and study location

The study subjects were only involved in the second and third phase of the study. In the second phase of the study, the study subjects were nine experts panel of academicians in higher learning institutions and psychologist and counseling practitioners at schools and institutions of higher learning. In the third phase of the study, 40 students of Secondary School in Terengganu were selected to obtain reliability data of MSUI.

Research Findings

Phase 1 Findings: MSUI Scale and Sub-Scale Development.

MSUI development is based on literature review from books, articles and various journals nationally and internationally on the measurement of motivation. This literature review examines the definitions, concepts, factors and implications of motivation from various perspectives. Furthermore, the theoretical foundation for the development of the major scale and sub-scale of MSUI is based on two main theories, namely the combination of Motivation of Success to University Counseling Model and the Cognitive-Behavioral Therapy approach. Based on this, the developed MSUI contains 70 items and MSUCM clarifies that there are seven strategies that need to be fulfilled in the hierarchy in developing motivation of success to the University; sub-scale 1: Triggering Self-Awareness (TSA) (10 items), sub-scale 2: Build Motivation to Learn (BML) (10 items), sub-scale 3: Developing Self-Potential (DSP) (10 items), sub-scale 4: Setting Life Goals (SLG) (10 items), sub-scale 5: Time and Learning Management (TLM) (10 items), sub-scale 6: Mastering Study Skills (MSS) (10 items) and sub-scale 7: Avoiding Social Problems (ASP) (10 items).
The findings of Phase 2: Content Validity of MSUI

Based on the expert panel agreement, the MSUI value is as shown in Table 1.

Table 1: The MSUI overall validity value and sub-scale (n = 8)

<table>
<thead>
<tr>
<th>Scale/Sub Scale</th>
<th>Item No.</th>
<th>Value (%)</th>
<th>Expert Result/ Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall MSUI</td>
<td>70</td>
<td>8.86 (88.6%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>TSA</td>
<td>10</td>
<td>9.01 (90.1%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>BML</td>
<td>10</td>
<td>8.72 (87.2%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>DSP</td>
<td>10</td>
<td>8.79 (87.9%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>SLG</td>
<td>10</td>
<td>8.60 (86.0%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>TLM</td>
<td>10</td>
<td>8.81 (88.1%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>MSS</td>
<td>10</td>
<td>8.90 (89.0%)</td>
<td>Accepted</td>
</tr>
<tr>
<td>ASP</td>
<td>10</td>
<td>9.22 (92.2%)</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Table 2: Analysis of MSUI overall reliability and sub-scale (n = 40)

<table>
<thead>
<tr>
<th>Reliability Test</th>
<th>Item No.</th>
<th>Cronbach Alpha</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall MSUI</td>
<td>70</td>
<td>.910</td>
<td>Very High</td>
</tr>
<tr>
<td>TSA</td>
<td>10</td>
<td>.807</td>
<td>High</td>
</tr>
<tr>
<td>BML</td>
<td>10</td>
<td>.809</td>
<td>High</td>
</tr>
<tr>
<td>DSP</td>
<td>10</td>
<td>.770</td>
<td>Moderate</td>
</tr>
<tr>
<td>SLG</td>
<td>10</td>
<td>.754</td>
<td>Moderate</td>
</tr>
<tr>
<td>TLM</td>
<td>10</td>
<td>.868</td>
<td>High</td>
</tr>
<tr>
<td>MSS</td>
<td>10</td>
<td>.750</td>
<td>Moderate</td>
</tr>
<tr>
<td>ASP</td>
<td>10</td>
<td>.821</td>
<td>High</td>
</tr>
</tbody>
</table>

Furthermore, the reliability analysis to test the quality level of the items being developed. For MSUI: Items 1-10 is sub-scale 1 i.e., Triggering Self-Awareness, Items 11-20 is sub-scale 2 i.e., Build Motivation to Learn, items 21-30 is sub-scale 3 i.e., Developing Self-Potential, items 31-40 is sub-scale 4 namely Setting the Life goals, items 41-50 is sub-scale 5 i.e., Time and Learning Management, items 51-60 is sub-scale 6 i.e., Mastering Study Skills and items 61-70 are sub-scale 7 i.e., Avoiding Social Problems. The built items quality is at a very good level and can be understood by respondents. This is in line with the opinion expressed by Mohd Majid\(^9\) (2005) who stated that the reliability coefficient of 0.60 or higher is acceptable.

Conclusion

Overall, this study has succeeded in establishing a Motivation of Success to University Inventory (MSUI) which has a high degree of content validity and reliability value. Therefore, MSUI is able to measure the level of motivation in achieving successful goals to the University which comprises of seven major sub-scales, namely Developing Self-Awareness (TSA), Building Learning Motivation (BML), Developing Self-Potentials (DSP), Setting Life Goals (SLG), Time and Learning Management (TLM), Mastering Learning Skills (MSS) and Avoiding Social Problems (ASP). The analysis of each item contained in this MSUI indicates that the quality of the items being developed is very good, satisfactory and understandable by the respondents. In conclusion, this study has shown that MSUI has high validity and reliability and produces a prototype that can contribute to the development of counseling and psychological assessment instruments to help students with motivation measurement.

Conflict of Interest: None

Source of Funding: Sultan Idris Educational University, Perak, Malaysia.

Ethical Clearance: Not required

References


Analysis of Internal and External Motivation Affecting the Adherence of Tuberculosis Patients Treatment in Public Health Center

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Abstract

The disease of pulmonary tuberculosis that occurs in adults mostly people who get a primary infection that is not handled properly. To achieve healing requires regularity or compliance treatment for every patient. Lack of adherence in the treatment of pulmonary tuberculosis either derived from the motivation or trust of the officers resulted in the treatment of pulmonary tuberculosis is not optimal.

This study aims to analyze the affecting of internal and external motivation toward adherence of pulmonary tuberculosis patients in the treatment of pulmonary tuberculosis in Public Health Center. This study was conducted in Bati-bati Public Health Center, Tanah Laut District, South Kalimantan Province from January to March 2015.

This research uses descriptive quantitative research design. The data used is the primary data obtained by interviewing the respondents by using questionnaires. Large Sample taken from the all of patients with pulmonary tuberculosis who are still undergoing treatment of pulmonary tuberculosis in Bati-bati Public Health as much 40 patients. Data were analyzed used Partial Least Square (PLS) with T-test.

The results of this research are the T-statistic score of internal motivation influence on adherence of pulmonary tuberculosis patients to treatment is 2,714, bigger than T-normal distribution table (1,96), meaning significant, hypothesis 1 accepted. The T-statistic score of external motivation influence on adherence of pulmonary tuberculosis patients to treatment is 3,742, bigger than T-normal distribution table (1,96), meaning significant, hypothesis 2 accepted. Internal and external motivation shows significant affecting to adherence of pulmonary tuberculosis patients in the treatment tuberculosis in Bati-bati Public Health Center, Tanah Laut District.

Keywords: Internal Motivation, External Motivation, Adherence, Pulmonary Tuberculosis

Introduction

Tuberculosis (TB) is a contagious disease that attacks the lungs caused by the germs of the Mycobacterium Tuberculosis. TB is a disease with high morbidity and is very easy to spread in the air through sputum (saliva) which is dumped on the streets by people with pulmonary tuberculosis. Therefore, TB should be handled promptly and carefully if it is found the case in a region.

Pulmonary TB is still one of the world’s health problems although control efforts with the DOTS strategy (Direct Observed Treatment, Shortcourse) have been applied in many countries since 1995[1].

Pulmonary tuberculosis is disease which almost one-third of the world’s population and in most countries in the world can not control TB disease due to the number
of patients who cannot be cured. The World Organization (WHO) in Annual Report on Global TB Control 2010 states that 22 countries are categorized as High Burden Countries (HBC)\[2\].

Indonesia is the country with the first rank among HBC in South East Asean region and is in the order of 5 countries with the highest Tuberculosis load in the world\[3\]. Epidemiologically, pulmonary tuberculosis disease in South Kalimantan since 2008 was in the 3rd position of 10 most diseases with positive TB disease rate of 113 per 100,000 population. In Tanah Laut District in 2010, 250 new patients found positive pulmonary TB (59.07 per 1000 population) with a conversion rate of 81.1% and cure rate of 79.5% and in Bati bati Public Health there were 40 people with pulmonary TB BTA positive where the cure rate is below 80% (79.1%)\[3\][4].

To achieve healing requires regularity or compliance treatment for every patient. Patient motivation is the drive to find a way (effort) to meet the health needs of patients. Or a condition that encourages or makes a person do the work consciously. Motivation is influenced by internal and external factors. Internal factors include: gender, physical character, attitude, experience, expectation, personality, intelligence, responsibility, while external factors include physical environment, family support, economy, culture and health education\[5][6][7][8].

Based on the above description, this research aims to analyze the affecting of internal and external motivation, on adherence of pulmonary tuberculosis patients in the treatment tuberculosis in the Public Health Center.

**Material And Method**

This research uses descriptive quantitative research design that analyzes the influence of internal and external motivation toward adherence of pulmonary tuberculosis patients in the treatment tuberculosis in Bati-bati Public Health Center, Tanah Laut District, South Kalimantan Province.

The data used are primary data obtained by interview with respondents by using questionnaire. It also used secondary data which is the data of pulmonary tuberculosis at Bati bati Public Health Center and Tanah Laut District Health Office 2015.

The population in this study were all residents in Bati-bati, Tanah Laut District who suffered from pulmonary TB and still undergoing pulmonary tuberculosis treatment. The sample or subject of the study in the case group is all of the patients with the results of sputum examination in the laboratory Public Health Center declared positive BTA (suffering from Pulmonary TB). Large Samples taken from the all of patients with pulmonary tuberculosis who are still undergoing pulmonary TB treatment at Bati-bati Public Health as much 40 patients and entirely used as a sample (total sampling).

Data analysis technique used is Partial Least Square (PLS) with T-test. But before the existing data were tested first the validity and reliability with the help of computer programs. PLS is a powerful analytical method because it is not based on many assumptions. PLS as data analysis techniques with smart PLS software version 2.0.M3\[9].

**Findings**

The characteristics of respondents based on Age could be described in Table 1:

**Table 1. The Distribution Frequency of Respondents Characteristics Based on Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29 years</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>30-39 years</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>40 years</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on the table 1 can be seen that most of the respondents studied were patients aged > 40 years. The youngest respondent was 21 years old and the eldest was 70 years old. This is likely due to old age is very vulnerable to various diseases. Body resistance and organ function has began to decline so easily infected a disease especially infectious and degenerative diseases.

From the conceptual framework can be seen which includes Internal Motivation are Responsibility (X\(_{1.1}\)), Desire to heal (X\(_{1.2}\)) and Fear to contagion (X\(_{1.3}\)), while those included in External Motivation are Family support (X\(_{2.1}\)), Environment (X\(_{2.2}\)), Health education (X\(_{2.3}\)). And the factors that affecting the patient’s adherence to treatment pulmonary tuberculosis are Commitment.
(Y1.1), No dropped medicine (Y1.2), Cooperation with the health workers (Y1.3).

The characteristics of respondents by Gender can be seen in the following Table 2:

Table 2. The Distribution Frequency of Respondents Characteristics Based on Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on the above table it is known that some of the respondents who studied were male. This is probably due to the many men have risk factors such as smoking, lifestyle etc. which is a predisposing factor that can worsen the condition of pulmonary TB disease suffered.

Before the existing data were tested first the validity and reliability with the help of computer programs. PLS is a powerful analytical method because it is not based on many assumptions. PLS as data analysis techniques with smartPLS software version 2.0.M3. Test validity and reliability is the quality of data on the use of research instruments. Test each to know the consistency and accuracy of data collected from the instrument used. Indicators are judged on the correlation between the score items and the score constructs calculated by the PLS application. The reflective size is considered valid if it has a loading value above 0.50 and or T-Statistic above 1.96. The PLS output for convergent validity is shown in the following table 2:

Table 3. Test Results of Validity

<table>
<thead>
<tr>
<th>Internal Motivation</th>
<th>External Motivation</th>
<th>Adherence</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1.1</td>
<td>0,896</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>X1.2</td>
<td>0,853</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>X1.3</td>
<td>0,873</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>X2.1</td>
<td>0,796</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>X2.2</td>
<td>0,702</td>
<td></td>
<td>Valid</td>
</tr>
</tbody>
</table>

From the table 2 can be seen that the value of loading all items > 0.50. Means it can be concluded all the items meet the good convergent validity. This validity test indicates that all factors influencing Internal Motivation as Responsibility (X1.1), Desire to heal (X1.2) and Fear to contagion (X1.3) are valid and External motivation are Family support (X2.1), Environment (X2.2), Health education (X2.3) also valid.

The next measurement model is composite reliability, a group of indicators that measure a variable has good composite reliability if it has a value greater than 0.70, although it is not an absolute standard.

Table 4. Composite Reliability on Test Reliability

<table>
<thead>
<tr>
<th></th>
<th>Composite Reliability</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Motivation</td>
<td>0,907</td>
<td>Reliabel</td>
</tr>
<tr>
<td>External Motivation</td>
<td>0,728</td>
<td>Reliabel</td>
</tr>
<tr>
<td>Adherence</td>
<td>0,911</td>
<td>Reliabel</td>
</tr>
</tbody>
</table>

From the PLS output it is shown that all the variables have composite reliability value above 0.70 so it can be concluded that the construct has good reliability.

The basis used in hypothesis testing to accept and reject the hypothesis is from the output of PLS result for inner weights, shown in the following table 4:

Table 5. Result for Hypothesis Test

<table>
<thead>
<tr>
<th></th>
<th>Original Sample Estimate</th>
<th>SD</th>
<th>T-Statistics</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mot Int Adherence</td>
<td>-0.279</td>
<td>0.103</td>
<td>2.714</td>
<td>Significant</td>
</tr>
<tr>
<td>Mot Eks Adherence</td>
<td>0.439</td>
<td>0.117</td>
<td>3.742</td>
<td>Significant</td>
</tr>
</tbody>
</table>
The T-statistic score of internal motivation influences on adherence of pulmonary tuberculosis patients to treatment is 2.714, greater than normal T-distribution table (1.96), meaning significant, hypothesis 1 is accepted. The T-statistic score of external motivation influences on loyalty of pulmonary tuberculosis patients to treatment is 3.742, greater than normal T-distribution table (1.96), meaning significant, hypothesis 2 is accepted.

**Discussion**

From the PLS estimation result shows that the T-statistic value of the internal motivation influence the adherence of pulmonary tuberculosis patients in the treatment of pulmonary tuberculosis is 2.714, greater than the normal T-distribution table (1.96), meaning that there is a significant influence between internal motivation variable on affecting of pulmonary TB in treatment at Bati-bati Public Health Center, Tanah Laut District (hypothesis 1 accepted). In accordance with the allegations from the researchers that the internal motivation of self-pulmonary tuberculosis patients themselves can lead to adherence in the treatment of pulmonary tuberculosis because of the results of interviews with some respondents they are eager to recover and fear of contagious to their own families both husband, wife and biological children. Hope to heal is a possibility contagious to their own families both husband, wife and their children. Hope to heal is a possibility that is seen to meet the particular needs of an individual based on past experiences, both from one’s own experience and from others that give rise to a desire to recover from an illness.

The t-statistic value of the path of external motivation influence on the adherence of pulmonary tuberculosis patients in the treatment of pulmonary tuberculosis is 3.742, greater than the normal T-distribution table (1.96), meaning that there is a significant influence between external motivation variable on adherence of pulmonary tuberculosis in the treatment at Bati-bati Public Health, Tanah Laut District (hypothesis 2 accepted). In accordance with the allegations from the researchers that external motivation also affects adherence in the treatment of pulmonary TB. The most influential is the family factor. The family support is a very important social support seen by family members as being accessible to the family in the healing of an illness, but family members perceive that supportive people are always ready to provide help and assistance if needed which leads to motivation to recover from a disease.

Data from the results of the study that independent variables studied showed significant effect on adherence of pulmonary tuberculosis patients to the treatment of pulmonary tuberculosis is internal motivation and external motivation. From the above it can be seen clearly that which affects the adherence of patients with pulmonary tuberculosis in the treatment of pulmonary TB in Bati-bati Public Health Center, Tanah Laut District, South Kalimantan Province is an internal motivation either in the form of responsibility, the desire to heal and fear of contagion the disease to family members others, as well as external motivation in the form of family support, environment and health education who generate adherence in the treatment of pulmonary TB. With the results of this study is expected to the health workers who holds the pulmonary TB program more inculcate the character of motivation in pulmonary tuberculosis patients to recover and motivate the family of pulmonary TB patients to continue to support pulmonary TB treatment because long-term treatment.

**Conclusion**

Internal motivation (responsibility, desire to heal and fear of contagion) shows significant affecting to adherence of pulmonary tuberculosis patients in the treatment of pulmonary tuberculosis in Bati bati Public Health Center, Tanah Laut District.

External motivation (family support, environment and health education) showed significant affecting to adherence of pulmonary tuberculosis patient in pulmonary tuberculosis treatment at Bati bati Public Health Center, Tanah Laut District.

In relation of the results of this study is expected to the health workers, especially those who handle pulmonary TB programs at Public Health Center in order to improve the service better. For example with internal character motivation and motivate family of patient to continue to support patient especially in the case of adherence to treatment. In addition, health workers can also increase counseling from the way of taking medication and side effects from the drug that can cause patients not adherence again in taking pulmonary TB drugs.
Conflict of Interest: None

Source of Funding: None

Ethical Clearance: The study was approved by the ethical committee of Department Health Policy and Administration, Airlangga University, Surabaya. All subjects were fully informed about procedures and objectives of this study and each subject prior to the study signed an informed consent form.

References

Daytime Sleepiness among Medical and Non-Medical Students and its Impact on their Academic Performance

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Abstract

University students are prone to have an insufficient sleep and tend to feel sleepiness during daytime, in which may impact cognitive function; impair the psychological health and academic performance. This study aimed to compare the prevalence of daytime sleepiness between medical and non-medical students in Management & Science University (MSU)–Shah Alam campus and to investigate the relationship between daytime sleepiness among university students towards their academic performance. A cross-sectional study was carried using Epworth Sleepiness Scale (ESS) was to identify and evaluate the effect of daytime sleepiness on academic performance. A total of 152 undergraduate students ranging from the age of 19 to 27 years were participated and completed the questionnaires with a response rate of 76%. Statistical analysis was done using Pearson’s Chi-Square Test. There were 56.6% of participants showed an abnormal score of ESS (>9) in both groups. Medical students reported having a high prevalence of daytime sleepiness (52.3%) whereas non-medical students showed slightly less prevalence of daytime sleepiness (47.7%). The results obtained might be due to the medical students have exposure to the hectic and excessive academic load causing the need to study until late at night. Poor academic results were revealed among 84 (55.3%) university students. A statistically significant association was observed between daytime sleepiness and lower academic performance (p<0.001). Medical students have a higher prevalence of daytime sleepiness compared to non-medical students.

Keywords: Daytime sleepiness; Academic performance, Medical students, non-medical students.

Introduction

Inadequate sleep is highlighted to be a public health matter that has relation to medical effects. Sleep has been found to be neglected from the priority list of most individual especially students. The study on daytime somnolence has been defined that it is a sudden, uncontrollable compulsion to fall asleep during daytime causing weak of alertness and concentration, a decrease of motivation and a high level of stress (¹). College students are highlighted as a unique population with their cultural sleep-related disorders (²). Sleep deprivation is common among university students, which may result in the sleep disorder like excessive daytime sleepiness (³). Students sleep late at night to do their tasks which results
in inadequate sleep hygiene. Furthermore, students often use technology and substances that compromise sleep quality and quantity\(^3,\,4\). Untreated sleep disorder may develop numerous negative consequences\(^4\).

Circadian sleep rhythm disorder is a delayed sleep phase syndrome occurred among young adult\(^5\). Smoking at night to keep the person stays awake can be seen to be trending among students. This habit significantly contributes to inadequate of sleep hours and affects academic performances\(^6\). Reduction or alteration of sleep at night has been associated with excessive sleepiness and impaired academic performance\(^7\). Analysis of the role of sleep showed four long-term memory systems which include procedural memory, perceptual representation system, semantic and episodic memory\(^8\). It requires either non-rapid eye movement (NREM) or rapid eye movement (REM) sleep or needs both of the sleep stages to consolidate memories\(^7\). Sufficient sleep is pivotal to physical health and also mental development for learning and memorization ability. Adequate sleep may initiate the function of cognitive systems for the better aspects of life and performance\(^8\).

The tendency of committing errors, especially among medical students while assessing the patients may exist\(^9\). To the best of our knowledge, many researchers have done the study regarding sleep disorder and daytime sleepiness, but only focusing on a particular group, for example only medical students. With this study that has been conducted, it helps to compare the degree of daytime sleepiness among medical students and non-medical students with the academic performance.

**Materials and Method**

This study is a descriptive correlation study that investigated the relationships between the two variables of daytime sleepiness and academic performance. Apart from that, it has been designed to predict the relationship between daytime sleepiness and academic performance. It indicates the outcome within a specific range of sleep disorder that correlated with the scores of academic achievements.

This cross-sectional study was carried out between May to June 2016. The study population comprised of the students enrolled in the main campus of Management & Science University (MSU), Shah Alam, Selangor, Malaysia at this time. The inclusion criteria of this study involved the current MSU male and female students, students enrolled in bachelor program, mentally stable and cooperative. The study subject must be within 19 to 27 years of age. The exclusion criteria comprise MSU staffs and outsiders, and those who refuse to cooperate.

A quota sample of surveys has been administered to 152 students in which these participants consisted of male and female students ranging from 19 to 27 years; each group compromised 76 students of medical and 76 non-medical students.

Data were collected by using the structured questionnaires that comprised of questions covering all of the study variables on socio-demographic, lifestyle, sleep pattern characteristics of medical and non-medical students and their examination results. Academic performance was analyzed with the previous academic grade results. The first section was socio-demographic part with some of the response choices of yes or no, while other variables need to be marked based on its categories. Section 2 is the Epworth Sleepiness Scale (ESS). This questionnaire is primarily used to determine the daytime sleepiness among the respondents\(^3\). It is a well-validated eight-item questionnaire\(^{10,\,11}\).

**Results**

There were 152 students responded and completed this survey from the total population of 200 students with a response rate of 76%. Table 1 summarizes the demographic characteristics and other study variables.

**Table 1: Frequency Distribution of the Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range (19-27) Years</td>
<td>152</td>
<td>100.0</td>
</tr>
<tr>
<td>Mean (22.6 ±1.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>39</td>
<td>25.7</td>
</tr>
<tr>
<td>Female</td>
<td>113</td>
<td>74.3</td>
</tr>
<tr>
<td><strong>Major</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>76</td>
<td>50.0</td>
</tr>
<tr>
<td>Non-medical</td>
<td>76</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Have Diagnosis of Sleep Disorder</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Among the 152 participants, 86 were diagnosed as daytime sleepiness representing a prevalence of 56.6%. There were 66 (43.4%) of the respondents do not have daytime sleepiness. As being derived from overall 152 respondents, both of the group, which are medical and non-medical students were being divided into same quantity, 76 students in each group by using quota sampling method.

Medical students reported having a high prevalence of daytime sleepiness (52.3%) whereas non-medical students showed slightly less prevalence of daytime sleepiness (47.7%).

The findings in Table 2 revealed those who came with a good performance came with only 19.1% of daytime sleepiness while 80.9% do not have daytime sleepiness. It showed a weak academic achievement was greatly obtained from those who experienced daytime sleepiness (86.9%).

A statistically significant difference was found between high scoring of ESS (Daytime
Sleepiness) and poor academic performance with regards to excessive daytime sleepiness
(P<0.001) as shown on Table 3.

Discussion

Medical students sleep less than general populations. Their average nighttime sleeping hours are similar to those with insomnia (12). Also, daytime sleepiness, insomnia, and insufficient of sleep (less than seven hours per night) are associated with psychiatric disorders. In this study, daytime sleepiness was detected in 45 (52.3%) medical students compared to non-medical students with slightly less (47.7%) having daytime sleepiness.

The data of this study show a high percentage of daytime sleepiness (52.3%) among medical student responders compared with the result of the study conducted in International Medical University, Malaysia (35.5%) (13). Non-medical students have slightly less percentage of (47.7%) of daytime sleepiness. This variation could be due to the difference in the cut-off value of the Epworth Sleepiness Scale. In the current study, the standard means value is 9; while the cut-off value in the study by Zainilawati et al. was 11. The medical students have to be on their morning and
evening educational and clinical assignments. Also, they study the medical books until late at night (14, 15). Utilization of memory and brain causing the medical students to feel fatigue not only in physical part but also mental part, in which give implication towards the sleep-wake cycle. The syllabus learned by those non-medical students might be straightforward and light and the students were not under pressure to handle the situations as those in medical students who need to face weekly test and examinations. The medical students whowill be the medical staffs later, this sleeping disorder should be prevented to reduce the errors while handling the patients and during consultation or surgery (16).

The association between sleep disorder of daytime sleepiness and academic performance among medical and non-medical students has not been investigated thoroughly. Most of the studies only conducted for a particular group such as in the earlier study by Johns et al (10) that carried out the study among medical students. The findings earned in this study showed a significant association between academic performance and daytime sleepiness. It was supported by another study in which sleep disorder could give implication on the school result. Abdulghani reported a significant relationship between ESS scores and academic achievement (P=0.002) (17). The university students were likely to complain having a sleeping disorder in this study for around 56.6% of students evaluated of having daytime sleepiness.

Sleep can have a role in facilitating the learning and memory processes. Conversely, sleep deprivation and fragmentation usually impair these functions (18). The previous study expressed the association between education and ESS score. Stated that higher ESS score was gained from people with both low and high level of education, compared with those people of medium education level. A few studies have displayed a significant relationship between daytime sleepiness and academic result. In this study, it was found 56.6% of all the participants suffered from daytime sleepiness. Thus, the study revealed a clear correlation between academic performance and daytime sleepiness (P<0.001). In the current study, a statistically significant difference (P<0.001) was found between daytime sleepiness and poor academic performance; this result is in agreement with previous study (1), which concluded that 68.5% of 108 Sudanese medical students that were studied had daytime sleepiness. Sleeper students did not achieve excellence in the previous examination; therefore, the requirement to improve awareness among medical students and teaching staffs about sleep education and sleep hygiene in addition to implementing the best indicator in scheduling duty hour for the lecture. A highly statistically significant difference between the good students and the weak students was concluded with regards to the feeling of insufficient sleep (P<0.001) and sleeping less than five hours per night (19). This study concluded that sleep deprivation (less than five hours) became part of medical students’ exposure and is associated with poor work-related performance, mood and medical errors.

These findings provide health educators with good sleep as an additional positive reason to promote engagement in health behaviors (20). Practical applications of these data for health lecturer on university campuses can conduct. For instance, health experts could continue with the implementation of programs related to healthy habits with the correlation between sleep and academic performance benefits to document the importance and value of these programs. Also, these results should be relevant to educators, administrators, parents, and students. These understanding of the findings may contribute to another connection of health behaviors for better academic achievement. Disturbances of sleep-wake behavior can be affected by academic demands, depression during examination week, social schedule, and insufficient sleep education.

There is a great concern about the relationship between daytime sleepiness and academic achievement; therefore, screening for causes of sleep deprivation and daytime sleepiness among medical and non-medical students is highly recommended. Measures to improve living conditions, and educate about good sleep hygiene are needed.

**Conclusion**

A high prevalence of daytime sleepiness was reported in this study on medical students compared to non-medical students. The daytime sleepiness was measured using ESS comprising the score more than nine as abnormal. Daytime sleepiness significantly affects the academic performance among medical and non-medical students of MSU Shah Alam. Education and awareness on the importance of enough sleep hours and the quality of the sleep could aid in improving the academic achievement and along with the
psychological and physical health of an individual. As the recommendation, further research on a larger scope regarding daytime sleepiness with its relations towards academic achievements in both groups of students, medical and non-medical need to be carried out due to its lack of previous investigations. To conclude, this present study is conducted to be as the reference with the hope that awareness of daytime sleepiness among university students will arise.

**Conflict of Interests:** The authors have declared that no conflict of interest exists.

**Source of Funding:** Self-funding.

**Ethical Clearance:** Ethical approval was obtained from the MSU Ethical Committee.

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Impact of Elevated Second Trimester Maternal Serum Alpha-Fetoprotein on Pregnancy Outcome – A Prospective Observational Study

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Abstract

Introduction: The major goal behind prenatal screening is to identify and intervene in high risk pregnancy. Measurement of second trimester maternal serum alpha-fetoprotein (MSAFP) has been shown to be useful in screening both for Aneuploidies and neural tube defects. Additionally in Pregnancies with normal fetus, high levels of MSAFP is associated with increased risk of adverse pregnancy and fetal outcome. Aim: To determine the association between the second trimester MSAFP and adverse pregnancy outcome. Method: This Prospective observational study was conducted in 200 antenatal women of gestational age between 14-24 weeks, with singleton pregnancy. Determination of maternal serum AFP levels was carried out and were followed till delivery. Fetal outcome was reported in terms of live birth, still birth, neonatal death. Results: The mean age of study subjects with MSAFP≤2MoM was slightly higher compared to those with MSAFP>2 MoM and the difference was not statistically significant (P>0.05). The frequency of pregnancy outcomes were as following; 10(5%) Pre-eclampsia, 20(10%) Preterm labour, 7(3.5%) PROM, 18(9%) Oligohydramnios, 2(1%) Still birth. There were significant correlation between Preterm labour, Pre-eclampsia, Oligohydramnios and higher MSAFP levels and was statistically significant. But correlation between PROM, Still birth and MSAFP levels were not significant. Conclusion: Unexplained elevated second trimester MSAFP is associated with adverse pregnancy outcomes such as preeclampsia, oligohydramnios and preterm labour. So it would be worthwhile for screening pregnant women in second trimester for MSAFP, as it would help to identify high risk pregnancies.

Keywords: Alpha-fetoprotein, prenatal screening, preeclampsia, oligohydramnios, still birth, preterm labour

Introduction

Prenatal screening is now an established part of routine Antenatal care. The major goal behind it is to identify and intervene in high risk pregnancy. Maternal serum Alpha-fetoprotein(MSAFP) Screening is one of them. Alpha-feto protein (AFP) is a glycoprotein, which is synthesized early in gestation by the fetal yolk Sac and later by the fetal gastrointestinal tract and Liver. AFP is found in steadily increasing quantities in maternal serum after 12 weeks and reaches a peak between 28 and 32 weeks.

Increased maternal serum levels of AFP are the consequence of increased amniotic fluid concentration in association with fetal defects; increased transfer from fetal to maternal circulation as a consequence of Placental damage and increased production in the mother from germ cell tumour, hepatocellular carcinoma and metastatic cancer in Liver. In normal Pregnancy, serum AFP concentration is affected by gestational age and maternal characteristics, including maternal weight, racial origin and cigarette smoking. Therefore for the effective use
of serum AFP measurements in risk assessment, these variables need to be taken into account which can be achieved by standardizing the measured levels into multiples of the normal median values (MoM).

Measurement of MSAFP during the second trimester of pregnancy has been shown to be useful in screening both for Aneuploidies and neural tube defects\(^7\)-\(^8\). Additionally in Pregnancies with normal fetus, high levels of MSAFP is associated with increased risk of adverse pregnancy and fetal outcome, including fetal death, Pre-eclampsia, Preterm labor, low birth weight and fetal growth restriction\(^3\)-\(^10\)-\(^13\). Also a raised MSAFP during second trimester of pregnancy is one of the best biochemical Predictor of the risk of unexplained still birth\(^14\).

The aim of this study was to determine the association between the second trimester MSAFP and adverse pregnancy outcome.

**Materials and Method**

This Prospective observational study was conducted in 200 pregnant women attending Outpatient department in Obstetrics and Gynaecology, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry. The antenatal woman of gestational age between 14-24 weeks, with singleton pregnancy were included in the study. Dating was based on the last menstrual period or an early sonogram. Patients with chronic hypertension, multiple pregnancy, molar pregnancy, chromosomally abnormal fetus, diabetes, chronic renal disease, autoimmune disorders, thrombophilias, family history of diabetes mellitus, hypertension, cardiovascular disease, and history of pre-eclampsia were excluded from the study. Determination of serum AFP levels in maternal serum was carried out. All these patients were followed till delivery and fetal outcome was reported in terms of live birth, still birth, neonatal death.

**Statistical Analysis**

The data were presented as Mean ± Standard Deviation. Statistical analysis were done by using Microsoft Excel and SPSS for windows version 11.5 (SPSS,Inc.,Chicago). P value<0.05 was considered statistically significant.

**Results**

In this study 200 pregnant woman with gestational age between 14-24 weeks were evaluated.

The mean age of study subjects with MSAFP≤2MoM (22.73 years) was slightly higher compared to those with MSAFP>2 MoM (22.28 years). However application of Chi-square test showed that this difference was not statistically significant (P>0.05).

The frequency of pregnancy outcomes were as following; 10(5%) Pre-eclampsia, 20(10%) Preterm labour, 7(3.5%) PROM, 18(9%) Oligohydramnios, 2(1%) Still birth.

There were significant correlation between Preterm labour, Pre-eclampsia, Oligohydramnios and higher MSAFP levels and was statistically significant.

But corelation between PROM, Still birth and MSAFP levels were not significant.

**Table 1 :** Age distribution of study subjects ( Mean ± SD).

<table>
<thead>
<tr>
<th>MS AFP</th>
<th>N</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2 MoM</td>
<td>100</td>
<td>22.73 ± 3.25</td>
</tr>
<tr>
<td>&gt;2 MoM</td>
<td>100</td>
<td>22.28 ± 3.91</td>
</tr>
</tbody>
</table>
Table 2: Risk of preeclampsia, preterm labour, PROM, Oligohydramnios, Still birth and Miscarriage by mean level of maternal serum AFP (Mean ± SD and p value).

<table>
<thead>
<tr>
<th>MSAFP</th>
<th>Variable</th>
<th>Number</th>
<th>(n/cc)</th>
<th>P. value</th>
<th>Variable</th>
<th>Number</th>
<th>(ng/cc)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preeclampsia</td>
<td>10</td>
<td>83.21±72.35</td>
<td>0.001</td>
<td>Without PROM</td>
<td>193</td>
<td>43.8±38.82</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without preeclampsia</td>
<td>190</td>
<td>47.32±38.29</td>
<td>0.018</td>
<td>Oligohydramnios</td>
<td>18</td>
<td>84.42±62.32</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td>Preterm labour</td>
<td>20</td>
<td>59.32±31.29</td>
<td>0.018</td>
<td>Without Oligohydramnios</td>
<td>182</td>
<td>46.17±37.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without preterm labour</td>
<td>180</td>
<td>45.81±38.32</td>
<td>0.89</td>
<td>Still birth</td>
<td>02</td>
<td>40.29±10.03</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>PROM</td>
<td>07</td>
<td>45.1±14.34</td>
<td>0.89</td>
<td>Without Still birth</td>
<td>198</td>
<td>43.37±37.55</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

There is a fundamental difference between screening and diagnostic tests. The aim of Prenatal screening is limited to the identification from among apparently healthy pregnancies to those at high enough risk of a given outcome to warrant the next step: an expensive or hazardous diagnosis; another secondary screening test; or preventative action. Markers are the building blocks of screening tests; the term itself implies the lack of a definitive result that characterizes screening in comparison to diagnosis. Maternal marker screening has advanced rapidly since AFP was first used to screen for fetal neural tube defects.

AFP is a glycoprotein, synthesized primarily by the fetal liver and yolk sac. It is also produced to a lesser extent by the fetal gastrointestinal tract. AFP synthesis by the proliferating fetal liver actually increases through the 20th week of gestation, after which it remains fairly constant until 32nd week. AFP is excreted in fetal urine and transported to maternal serum through the placenta or by the diffusion across fetal membranes.

In our study, unexplained high levels of MSAFP had been associated with preeclampsia, preterm labour, oligohydramnios. In a prospective study conducted by Konachuk et al, 35% of pregnancies with unexplained increased AFP level had at least one adverse perinatal outcome. Elevation of MSAFP was related to increased transition from fetomaternal circulation due to the placental feto maternal surface damage. Similarly, Wald et al reported that an increased incidence of low birth weight, Prematurity and perinatal death in pregnancies with AFP level above 3MOM. Bernstein et al and Kuo et al had also reported that woman with elevated MSAFP level had an increased incidence of Pre-eclampsia, Preterm labour, fetal growth retardation and fetal death.

In our study, the pregnancy that went on to develop Preeclampsia, the MSAFP levels were significantly raised. And the difference was statistically very significant. Waller et al, Williams et al, Bhattacharjee et al also had confirmed the association of unexplained MSAFP elevation with preeclampsia.

Similarly, there was significant association between elevated MSAFP levels and preterm labour in our study and was statistically significant. Neggers et al in their study on evaluation of relationship of MSAFP to preterm labour, had concluded that MSAFP levels greater than 90th percentile significantly increased the risk of preterm labour. Similar observations were also made by Rebecca Allen et al and Kuo et al.

Though MSAFP levels were raised in patients with PROM, the difference was not statistically significant. But Simpson et al had observed that women with PROM showed elevated MSAFP levels. Efficient antenatal care, early identification of patients at risk for PROM and subsequent management in our centre would have reduced the incidence of PROM even in patients with high MSAFP levels.
There was a very significant correlation between MSAFP levels and oligohydramnios and was statistically very very significant. This finding was consistent with the studies by Konachuk et al\textsuperscript{20} and Huerta – Enochian et al\textsuperscript{30}.

In our study, there was no significant association between the levels of MSAFP and stillbirth. But Waller et al\textsuperscript{31} and Cusick et al\textsuperscript{32} had found that women with high MSAFP levels had a very high risk of stillbirth. Probably the less number of cases (1%) of stillbirth in our study was not enough to evaluate the association.

**Conclusion**

Unexplained elevated second trimester MSAFP is associated with adverse pregnancy outcomes such as preeclampsia, oligohydramnios and preterm labour. So it would be worthwhile for screening pregnant women in second trimester for MSAFP, as it would help to identify high risk pregnancies.

But screening for MSAFP in second trimester seems to be of little value in predicting PROM and stillbirth. However further extensive studies are needed to validate our conclusion.

**Conflict of Interest** – No

**Source of Funding**- Self

**Ethical Clearance** – IEC/C:104/2017

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Menstrual Disorders: A Comprehensive Review

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Abstract

Menstrual disorders are the most common gynaecological issues encountered by women in their reproductive age and which can affect personal, familial and social life. The World Health Organization recently reported that 18 million women aged 18-23 years perceive their menstruation to be extreme.¹ The first menstruation or menarche occurs at around 11 to 15 years of age with an average of 13. Literature review from numerous studies indicates that starting from the third year after menarche, the interval between bleeding ranged from 21-34 days, with a blood flow lasting 3 to 7 days and a mean blood loss of 35 ml (range of 5-80 ml).²

The menstrual cycle is divided into two phases namely follicular and luteal phase. The first one follicular phase approximately 14-21 days commences with onset of menstruation and ends on the day before the luteinizing hormone (LH) surge. The second luteal phase begins on the day of LH and ends at the onset of the next menstruation 14 days.³

There are many types of menstrual disorders examples are amenorrhea, abnormal uterine bleeding, dysmenorrhea, and premenstrual syndrome are particularly common in adolescent girls.⁴, ⁵, ⁶ This article aimed at enhance the understanding of the common menstrual disorders like abnormal uterine bleeding, amenorrhea, dysmenorrhea, and premenstrual syndrome prevalence, causes, diagnosis, and management.

Keywords: Menstrual Disorders, Dysmenorrhoea, Amenorrhoea, Abnormal uterine bleeding, Premenstrual syndrome.

Introduction

Menstruation is a physiological phenomenon and this has a considerable effect on the health status and the quality of life of women. Deviation from normal menstruation is observed among young women.⁷ Menstrual disorders is described as a gynaecological morbidity during the reproductive age of women all around the world.⁸ Globally reproductive ill health constitutes 32% of total burden of disease among the reproductive age group women.⁹

The common abnormalities of menstruation includes dysmenorrhea, premenstrual syndrome, abnormal vaginal bleeding, amenorrhea etc.¹⁰ Premenstrual syndrome (PMS) and dysmenorrhoea were most prevalent among adolescent girls which accounted for almost 20-90% and the prevalence of PMS was found to be 47.8%.¹¹, ¹² Menstrual disorders are found to be associated with physical and psychological factors.¹³

Aetiology of Menstrual disorders

1. Physiologic: adolescence, perimenopause, lactation and pregnancy
2. Pathologic
   a. Hyperandrogenic
   b. Hypothalamic
   c. Thyroid disease
   d. Primary pituitary
   e. Premature ovarian failure
   f. Medications/herbal supplements

Introduction

AUB refers to the uterine bleeding of abnormal volume, duration, regularity or frequency.²⁰ AUB is reported to occur in 9 to 14% women between menarche and menopause²¹, ²² and may have a significant impact on their physical, social, emotional quality of life.²³
The commencement of conflicting terminology for AUB dates back to the late 1700s by William Cullen, Professor of Physic at the University of Edinburgh, Scotland. The term dysfunctional uterine bleeding was invented but certainly not clearly defined by Graves 1935. Menstrual Disorders Working Group within the International Federation of Gynecology and Obstetrics (FIGO) which was named as the Menstrual Disorders Committee who developed internationally supported recommendations on definitions and terminology for AUB. AUB have been conventionally articulated in terms like Menorrhagia, Metrorrhagia, Polymenorrhoea and Oligomenorrhoea presently the nomenclature to describe AUB has been classified and approved by the International Federation of Gynaecology and Obstetrics (FIGO) Executive Board as a FIGO classification system PALM-COEIN (2011).

Figure 1: PALM-COEIN

Acute AUB is defined as an occurrence of bleeding that is of sufficient quantity requiring immediate intervention to prevent further blood loss in a woman of reproductive age who is not pregnant. Chronic AUB is defined as bleeding from the uterine corpus which is abnormal in duration, volume, and/or frequency and has been present for the majority of the last 6 months. The most common cause of AUB are structural uterine pathology (eg, fibroids, endometrial polyps, adenomyosis), ovulatory dysfunction, disorders of hemostasis or neoplasia.

Diagnosis

- Obtain a thorough medical history focusing on age, details of bleeding episodes, past menstrual, obstetrical, gynaecological and medical history, bleeding disorders, sexual and reproductive history, overweight, obesity, hypothalamic or adrenal disorders, thyroid dysfunction, impact on quality of life and medication. History of obstetric or gynaecologic surgery and asking the women regarding the use of contraceptive methods.

- Physical examination includes focusing on signs of blood loss and estimating anaemia, BMI. Pelvic and speculum examination.

- Lab Investigation- Pregnancy test, complete blood count, blood type and cross match, Prolactin hormone, E2, FSH, TSH, Androgen levels, oestrogen levels sexually transmitted diseases and coagulation profile, thyroid disorders, liver disorders, sepsis, von willebrand factor antigen, and leukemia. Imaging studies includes MRI, trans-vaginal ultrasonography, hysteroscopy and endometrial biopsy.

Management

Management include pharmacological, surgical and radiological approaches.

Goals of management:-

- Regulations of menstrual cycles
• Reduce blood loss
• Improve the quality of life

The expert organizations The American College of Obstetricians and Gynaecologists (ACOG), 43-46 American Academy of Family Physicians (AAFP), 47 and National Institute for Clinical Excellence (NICE) 48 recommended to include oral contraceptives, progestins, NSAIDs, levonorgestrel IUD, and anti-fibrinolytics for management of irregular bleeding and AUB.

Pharmacological approach:-

The Pharmacological approach for AUB is based on the action of hormones and other inflammatory mediators on the endometrium, in addition to the hemostatic control of the bleeding.49-50 Pharmacologic therapies used for treatment of AUB are estrogens, progesterone, combination (estrogen and progesterone) hormonal formulations, non-steroidal anti-inflammatory drugs, antifibrinolytics, and gonadotropin releasing hormones. Medical interventions are generally considered first line treatment.51-52

Combined Oral Contraceptives 53-57

**Dosage**

**Acute bleeding**

Contraceptives with ethinyl estradiol 30 mcg or 35 mcg 1 tablet/day, every 8 hours, for 7 days, followed by 1 tablet/day for 3 weeks.

**Chronic bleeding**

Combined oral, combined transdermal contraceptives or combined vagina l ring - all according to the package insert.

**Oral progestogen 53-57**

**Dosage**

**Acute bleeding**

Medroxyprogesterone acetate 20 mg, every 8 hours, for 7 days.

**Chronic bleeding**

Oral medroxyprogesterone acetate (2.5-10 mg), or norethisterone acetate (2.5-5 mg), or megestrol acetate (40-320 mg) at the dose recommended in the package insert, or micronized progesterone (200-400 mg), dydrogesterone (10 mg).

**No ovulatory dysfunction:** 1 tablet/day from the 5th to 26th day of the cycle or continuously.

**With ovulatory dysfunction:** adjust dose/day, use for 2 weeks every 4 weeks.

**Levonorgestrel-releasing intrauterine system 53-57**

**Chronic bleeding**

Insert the levonorgestrel - releasing intrauterine system every 5 years, with release of 20 mcg/ day.

**Depot medroxyprogesterone acetate 53-57**

**Chronic bleeding**

150 mg intramuscularly injected every 12 weeks

**Gonadotropin-releasing hormone analog 53-57**

**Chronic bleeding**

Leuprolide acetate (3.75 mg monthly or 11.25 mg quarterly) intramuscularly, or goserelin (3.6 mg monthly or 10.8 mg quarterly), or sub dermal.

**Non-steroidal anti-inflammatory drugs 58**

**Dosage**

**Chronic bleeding**

Ibuprofen 600 to 800 mg, every 8 hours, or mefenamic acid 500 mg every 8 hours.

Contraindication: Pregnant, gastrointestinal bleeding, inflammatory bowel disease, severe asthma, use after CABG procedure, renal disease, CVD, CHF61

**Efficiency-** Moderate

**Tranexamic acid Anti-fibrinolytic agents 59,60**

**Dosage**

**Chronic bleeding**

US Food and Drug Administration (FDA): 1.3 g, 3 times a day, for up to 5 days, or 10 mg/ kg intravenously (at a maximum dose of 600 mg/dose, every 8 hours, for 5 days (in cases of bleeding without structural lesion).
Surgical approach

Surgical options are classified as first-generation (hysteroscopic) and second generation (non-hysteroscopic) endometrial ablation, myomectomy and hysterectomy, dilation and curettage (D&C), endometrial ablation, uterine artery embolization. Reports concluded that uterine artery embolization and endometrial ablation can successfully control acute AUB. Hysterectomy is only considered in case of uncontrolled heavy bleeding and for the patient who do not respond to medical management.

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Ethical Clearance: Not required as it a review article.

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Comparison of Ultrasonographic and Doppler Mapping of the Intervillous Circulation in Normal and Abnormal Early Pregnancies

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Abstract

Objectives: To assess the value of transvaginal ultrasonography and transvaginal colour Doppler imaging in characterizing the Intervillous circulation in normal and abnormal pregnancy.

Design: cross-sectional study. Setting: AL-Elwiya Maternity Teaching Hospital, Baghdad-Iraq. Main outcome measures: Comparison of detection the moving echoes in the Intervillous circulation with grey-scale and colour Doppler imaging in normal and abnormal early pregnancies.

Subject and Method: 162 pregnant women fulfilled the criteria for the inclusion in this study were evaluating for diagnosis and fate of pregnancy. All of the pregnant women were subjected to transvaginal ultrasound and transvaginal colour Doppler imaging examination only once time by using 5-MHz curve liner transvaginal probe, with pulsed colour and power Doppler facilities and real time grey-scale ultrasound were used to evaluate the placenta anatomy and to detect the moving echoes inside the Intervillous space at peripheral and central areas. 67 pregnant women has been subjected to both above examinations at 7-9 weeks, 53 of total 162 at 10-11 weeks and the rest 42 at 12-14 weeks of pregnancy.

Results: A significant different distribution of blood flow was found between normal and abnormal pregnancies at 7-9 weeks and 10-11 weeks but not at 12-14 weeks. There is no difference in the use of the transvaginal ultrasound and transvaginal colour Doppler imaging, regarding the efficiency of the equipment but it remain dependable on the efficiency of the sonographist.

Conclusion: Early prediction of pregnancy that ended with abortion during the first trimester for any reason (Genetic, Immunological, Infectious) can be studied by simple methods like transvaginal ultrasound (gray-scale) and transvaginal colour Doppler ultrasound and useful for the prediction of pregnancy fate.

Keywords: Intervillous circulation, transvaginal ultrasound (TVUS), transvaginal colour Doppler images (TVCDI), fate of the pregnancy.

Introduction

The early placental development create a low resistance arteriolar vascular system. The trophoblastic plugs are thought to act as valves and restrict the flow velocity of the spiral arteries in order not to damage the developing placental membrane, also develops in a hypoxic environment which stimulate trophoblast proliferation and inhibit trophoblast invasion. At about 10-12 weeks’ gestation, true Intervillous circulation is established and there is an increase in placental PO₂ Levels. After 11 weeks of pregnancy the primary chorionic villi develop and begin to branch to form secondary chorionic villi and the lined mesenchymal cells, which differentiate into arteriocapillary networks. During the first trimester of pregnancy, the growing embryo and its placenta are completely separated from the maternal circulation. After 12 weeks, the trophoblastic plugs in the spiral arteries, no longer obliterate the uteroplacental arteries and
real circulation is established \([1, 3, 7]\). Burton et al., examined the Boyd Collection, showed that there was significant blockage of the maternal spiral arterioles by trophoblasts at points of contact with the Intervillous space between 6 and 8 weeks and gradually eliminated between 8 and 12 weeks of gestation \([8]\), the first trimester low-flow concept has not been universally accepted \([9, 10, 11]\). Jauniaux et al. \([12]\) report a significant increase in placental Intervillous oxygen tension, and hence maternal perfusion of the placenta, between 8 and 12 weeks of gestation. Burton and colleagues \([8]\) had offered the presence of dilated endometrial glands below openings to the Intervillous spaces. It is well known that the endometrial glands of early pregnancy are characterized by hypersecretion \([13]\). Pijnenborg et al. proposed a two-wave hypothesis for trophoblast invasion an initial interstitial invasion in the first trimester followed by endovascular invasion in the second trimester. Physiological changes also seen in the region that the interstitial trophoblast were able to modify the maternal arteries indirectly, presumably via paracrine action, simply by surrounding these vessels \([14]\). Matijevic et al. \([15]\) using transabdominal colour flow and pulsed Doppler imaging, showed that these changes were complete at around 17 weeks of gestation and that impedance to blood flow is lowest in the uterine arteries in the central area of the placental bed. These findings were supported by Jaffe and Woods \([16]\), which studied 46 women from 6 to 12 weeks of pregnancy by using transvaginal colour Doppler ultrasonography. Some authors studied a group of normal pregnancies from 7 to 12 weeks’ Gestational age to evaluate the utility of colour Doppler sonography of the uteroplacental circulation in predicting the outcome of first trimester pregnancies. They described a higher incidence of abortions among pregnancies that showed a greater resistance index (RI) in the retro- trophoblastic region. They also detected blood flow in the Intervillous space between 7 and 12 weeks \([17]\).

**Materials and Method**

**Subjects:**

The study was conducted on pregnant women (162) attending the Obstetrics and Gynecology Department at Al-Elwiya maternity Teaching Hospital and from private clinic. The study was extended from 1/7/2014 to 1/7/2015.

The pregnant women evaluated for the following information:

* Diagnosis of pregnancy is based on the last menstrual period, pregnancy test and abdominal ultrasound in the outpatient clinic.

* Duration of pregnancy: The Gestational age was determined by the initial data of the last menstrual period, crown-rump length up to 14 weeks, biparietal diameter were used for evaluation the evolution of the pregnancy.

* Fate of pregnancy: the evolution of the pregnancy was assessed by clinical examination, abdominal ultrasound, TVUS and TVCDI to confirm the viability of the fetus or absence of embryo.

Criteria for exclusion from the study were as follow:-

*chronic maternal diseases [pneumopathies, hypertension, autoimmune diseases and diabetics Mellitus].

*Myometrial pathologies, uterine malformations.

*patients who had undergo surgical intervention through the present gestation.

*Echo graphic embryo malformation.

*Multiple gestation.

**Transvaginal ultrasound and transvaginal colour Doppler imaging examination:**

The examinations of the intraplacental circulation were performed to all pregnant women 162 for one time during their pregnancy in 67 pregnant women (7-9 week), 53 pregnant women (10-11 week), and 42 pregnant women (12-14 week), by using a 5-7.5 MHz Curvilinear transvaginal probe with pulsed colour and power Doppler facilities. In each Case, moving echoes inside the Intervillous space was detected, at the periphery and the central of the uteroplacental circulation. A minimum blood flow velocity detectable of 3.7 cm/s for color Doppler and 0.4 cm/s for power Doppler.

**Statistic**

The SPSS program (statistical package of social science) standard version, Version 9.1\(^{\text{th}}\), 2012 by SAS. Inst. Inc. Cary. N.C. USA, was used. It included application of the Chi Square test to assess the degree of significance between different variable P [0.05] it also included application of the frequency of the different variables and cross.
Results

The transvaginal ultra sound findings and the transvaginal colour Doppler findings:

The TVUS and TVCDI with \([P +ve, C-ve]\) 73 (45.1\%), \([P -ve, C+ve]\) 68 (41.9\%), \([P +, C+ve]\) 21 (13\%) and as shown in Figure (1).

Figure (1): The transvaginal Ultrasound finding, \(P=\) peripheral, \(C=\) Central.

The classification of the pregnant women according to the weeks of pregnancy:

Out of the 162 pregnant women, 67 (41.4\%) had the TVUS and TVCDI at 7-9 weeks of pregnancy, 53 (32.7\%) at 10-11 weeks of pregnancy, and the rest 42 (25.9\%) had the examinations at 12-14 weeks of pregnancy as shown in Figure (2).

Figure 2. The classification of the pregnant women according to the weeks of pregnancy.

The relation between the TVUS, TVCDI findings and fate of pregnancy according to weeks of pregnancy:

At 7-9 week:

Out of 162 pregnant women, 67 (41.4\%) pregnant women had TVUS, TVCDI: 39 (58.2\%) with \([P +ve, C-ve]\) all of them reached to full term, 28 (41.8\%) with \([P -ve, C+ve]\) all of them ended with abortion. No pregnant woman with both \([P+ve, C+ve]\) at this period of pregnancy. \([P = 0.001]\) as show in figure (3).

Figure (3): The \% of the pregnant women with TVUS and TVCDI findings at 7-9 weeks.

At 10-11 week:

Out of 162 pregnant women, 53 (32.7\%) pregnant women had TVUS and TVCDI: 29 (54.7\%) women were with \([P +ve, C-ve]\) all of them reached to full term. 23 (43.4 \%) were with \([P-ve, C+ve]\) all of the them ended with abortion. And only one 1.9\% with \([P+ve, C+ve]\) as the pregnant woman ended with abortion. \([P = 0.001]\) as show in figure (4).

Figure (4): The \% of the pregnant women with TVUS and TVCDI findings at 10-11 weeks.

At 12-14 week:

Out of 162 pregnant women, 42 (25.9\%) pregnant women had the TVUS, TVCDI: 5 (11.9\%) with \([P +ve and C –ve]\) and they reached to full term. 17 (40.5 \%) with \([P-ve and C+ve]\) and all of them ended with abortion. 20 (47.6\%) with \([P+ve, C +ve]\) and all of them reached to full term. \([P = 0.001]\) as show in figure (5).
Pregnant women with fate of the pregnancy:

Out of 162 pregnant women, 93 (57.4%) reach to full term pregnancy, and 69 (42.6%) end with abortion. 69 pregnant women end with abortion 34 (49.3%) with blighted ovum, 24 (34.8%) with missed abortion, and 11 (15.9%) with incomplete abortion, [P < 0.003] as shown in Figure (6).

Discussion

There is a significant association between TVUS, TVCDI findings and the fate of the pregnancy. According to figure (1) and (2) The fate in those women with these findings were, all The pregnant women with [P+ve, C-ve] reached to full term i.e. they had normal pregnancy, while with [P-ve, C+ve] ended with abortion i.e. they had abnormal pregnancy and with [P+ve, C+ve] 20 (95.2%) reached to full term and only one (4.8%) ended with abortion. These findings agreed with the findings of Hustin and Schaaps [5] who suggested that no real blood circulation in the Intervillous space was present in the early stages of pregnancy as well as they found that moving echoes could always be detected in the myometrial vessels in the normal pregnancies but these moving echoes could only be detected in the placenta in 6% of cases. by contrast, they found slow turbulent movements inside the placenta in 96% of cases of early pregnancy failure. These findings were further supported by Jauniaux et al. [18] who did not identify Intervillous flow before 12 weeks of gestation in normal pregnancy, although it was observed in women with abortions. He also suggested that in normal pregnancies, the Intervillous circulation starts in the periphery of the placenta (p), whereas in early pregnancy failures, it is more intense and diffuse throughout the placenta with central perfusion (C) [19], while moving echoes were mainly at the periphery of the uteroplacental circulation in the normal pregnancy, and at both the center and the periphery in abnormal pregnancy[20]. These results also seen in figures (3, 4), only one case ended with abortion with both perfusion central and peripheral start to appear at this period, which indicate that this finding must be abnormal at this period although the sample is small. While figure (5) shows the results of women with both central and peripheral perfusion and all of them reached to full term. these results indicate that the peripheral perfusion with or without central perfusion during this period 12-14 week indicate a normal pregnancy, while central perfusion without peripheral perfusion indicate abnormal pregnancy in this period, as same as 2 periods [7-9 weeks, and 10-11 weeks]. The explanation of these findings as Jauniaux found that during the first 10 weeks of normal pregnancy, the apical portions of the majority of the uteroplacental vessels are partial obliterated by plugs of invading trophoblast cells, he’s hypothesized that these plugs prevent continuous flow of maternal blood into the Intervillous space during this period and therefor the human placenta is not truly hemochorial until the end of the first trimester [21]. Norman and Lodwick [22] found that, in early pregnancy failure the trophoblastic shell is thinner and fragmented and the trophoblastic infiltration of both lumen and endometrial vessels and the decidua is reduced or absents. Figure (6), out of 162 pregnant women 69 (42.6%) ended with abortion. 68 (98.6%) of them were with [P-ve, C+ve] and only one (1.4%) was with [P+ve, C+ve] and this woman was at the 10-11 weeks of pregnancy period. The higher significant percent of type of abortion is with blighted ovum as they are non-embryonic pregnancy so there is no trophoblastic shell or plugs so there is continuous flow of maternal blood into the Intervillous space as an abnormal utero-placental circulation. Jauniaux [20] found that, Intervillous blood flow was significantly more frequently with in missed abortion, also suggest that the uteroplacental blood flow may be different in missed abortions and non-embryonic gestational sacs than in normal Pregnancies.
**Conclusions**

The beneficial use of the transvaginal ultrasound or transvaginal colour Doppler in estimation the conditions of the placenta in early pregnancy especially in the presence of abnormal pregnancy and the results of these examinations may give an idea to some extents about the fate of the pregnancy and indicate that there is no difference in the use of the transvaginal ultrasound and transvaginal colour Doppler imaging regarding the efficiency of the equipment but it remains dependable on the efficiency of the sonographist. Early prediction of pregnancy that ended with abortion during the first trimester for any reason (Genetic, Immunological, Infectious) still represent a big challenge to the clinicians and patients alike, and these two simple methods are useful for the prediction of the fate of the pregnancy that liable for abortion. Early normal color Doppler imaging can avoid unnecessary invasive techniques. The results of this study necessitate further studies to be carried out on the same field for further evaluation of these results.

**Ethical Clearance:** The Research Ethical Committee at scientific research by the Iraqi Board For Medical Specializations/Ministry of Higher Education and Scientific Research.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**

16. Jaffe R, Woods JR. Colour Doppler ultrasound and in vivo assessment of the anatomy and physiology of the


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Abstract

Background: Mammography is a tool for screening and diagnosis of breast cancer. Increasing density of the breast affects the accuracy of mammogram. Sociodemographic and reproductive factors play a role in varying density of the breast. Therefore, evaluation of the risk factors that may lead to increase density, will be an important key in the early detection of breast cancer.

Objectives: To comment on breast density in Iraq.

Method: A total of 400 patients were enrolled in the study. One hundred attendants were excluded due to insufficient data. The sociodemographic, reproductive data and mammographic views were acquired from record files.

Results: A peak density was type B (scattered fibro glandular). Age, parity, menstrual status, breast feeding and obesity were significantly affecting density of breast (p= 0.002, 0.003, 0.001, 0.001 and 0.007, respectively). Smoking, using contraception and family history of breast cancer were not affecting the mammographic density.

Conclusions: Higher breast density in younger age group, nulliparous, those were menstruating regularly or irregularly comparing with non-menstruating women, shorter duration of breast feeding with low BMI may increase the mammographic breast density. Dense breast might obscure the lesions and reduce the accuracy of mammography.

Keywords: breast density, risk factors, Iraq, mammography.

Introduction

Mammography is a tool for screening and recently become a diagnostic instrument.¹ Density of the breast affect negatively the accuracy of mammograph² which in turn, affects the early detection of breast cancers.³ High breast density on mammography is associated with an increased risk of breast cancer. It was estimated that the risk in women with highest breast density was 4.64 time than that in women with lowest breast density.⁴ Ductal tissue, where breast cancer arises, and the surrounding structurally supportive stromal collagen appear white, while fatty tissue appears dark on mammography.⁴ Literatures showed that density of the breast varied between regions ⁵ and affected by sociodemographic and reproductive factors.⁶,⁷

Breast density is a neglected subject of research in Iraq. Therefore, this study was carried out to comment on breast density in Iraq.
Materials and Method

A total of 400 attendants to woman health center in AL Elwiya Teaching hospital for maternity were enrolled to this study. They were recruited by including all attendants to woman health center for nine weeks. The period of 1st of October to 1st of December 2018. One hundred attendants were excluded because of insufficient data. The requested information was sociodemographic, weight, length, reproductive data and mammographic views acquired from file records. Thirty views were reviewed for second time by the same radiologist to confirm the accuracy of reports. The density was classified according to American college of Radiology including: (A) almost entirely fat (fibro glandular tissue <25%), (B) scattered fibro glandular densities (fibro glandular tissue 25- 50%), (C) heterogeneously dense (fibro glandular tissue 50-75%), and (D) extremely dense (fibro glandular tissue >75%). The BMI was measured (weight in kilogram divided on the squared length in meters). Data were dichotomized, density as (dense and non-dense), BMI as (non-obese and obese), contraception history as (negative and positive), smoking as (negative and positive). The age of attendants was grouped into <40, 40-59 and ≥ 60, feeding history was classified as (negative who never fed, those who fed for <2 years and those for ≥2 years). The menstrual status as (nomense, regular mense and irregular mense), family history of breast cancer as (negative, had 1st degree relative, 2nd degree relative and those had both).

The Chi-square test and Fisher’s exact test were used to examine the effect of studied factors (independent) on breast density (dependent). P value ≤0.05 was considered significant.

Results

Table 1 shows that 82 (27%) had extremely fatty breast (A), 138 (46%) had scattered fibro glandular breast tissue (B), 68 (23%) had heterogenous fibro glandular breast tissue (C) and 12 (4%) had extremely dense breast (D).

Table 2 shows, those aged <40 years, 17 (35%) had dense breast, of those aged 40 – 59 year, 61 (29%) had dense breast and those aged ≥ 60 years and 2 (5%) had dense breast. Density of breast was significantly declined with age ($\chi^2=12.2$, df= 2, p= 0.002).

Of nulliparous women, 10 (39%), of those with 1-4 parity, 44 (32%) and those with parity≥ 4, 26 (19%) had dense view. A significant association between density of breast and parity was noticed ($\chi^2= 7.4$, df= 2, p= 0.03).

Women with 1st, 2nd degree relative with history of breast cancer and both, had 6 (21%), 9 (25%) and 4 (25%) dense breast, respectively. No significant association between the breast density and the family history of breast cancer was observed ($\chi^2= 0.8$, df= 3, p= 0.9).

Of the total women with negative breast feeding history, 20 (36%) had dense mammographic view. Those breast fed <2 years, 41 (34%) and of those ≥2 years, 19 (15%) had dense view. A significant inverse association of the breast feeding and mammographic breast density was demonstrated ($\chi^2= 14.5$, df= 2, p= 0.001).

Seventy nine (27%) of those not using contraception, had dense view and of those used contraception, 1 (8%) had dense breast. No significant association between breast density and contraception use was demonstrated ($\chi^2= 2.1$, df= 1, p= 0.2).

Of those with regular or irregular mense, 48 (40%) and 19 (40%) had dense view, respectively. Of those with no mense, 13 (10%) had dense breast. No mense was significantly associated with dense breast ($\chi^2=34.8$, df=2, p= 0.001).

Four (3%) of obese and eight (6%) of non-obese women, had dense breast, respectively. Density of breast was significantly associated with non-obese women was noticed ($\chi^2=12.1$, df= 3, p= 0.007).

<table>
<thead>
<tr>
<th>Mammographic density</th>
<th>Frequency</th>
<th>Percent%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Extremely fatty (&lt;25%)</td>
<td>82</td>
<td>27%</td>
</tr>
<tr>
<td>B scattered fibro glandular (25-50%)</td>
<td>138</td>
<td>46%</td>
</tr>
<tr>
<td>C heterogenous dense (50-75%)</td>
<td>68</td>
<td>23%</td>
</tr>
<tr>
<td>D extremely dense (≥75%)</td>
<td>12</td>
<td>4%</td>
</tr>
</tbody>
</table>
Table 2: Correlation of studied variables with breast density.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Density</th>
<th>Chi square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 40</td>
<td>17</td>
<td>35</td>
</tr>
<tr>
<td>40 – 59</td>
<td>61</td>
<td>29</td>
</tr>
<tr>
<td>≥ 60</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Null (zero)</td>
<td>10</td>
<td>39</td>
</tr>
<tr>
<td>1-4</td>
<td>44</td>
<td>32</td>
</tr>
<tr>
<td>≥ 4</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Family history of breast cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>61</td>
<td>28</td>
</tr>
<tr>
<td>1°degree relative</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>2°degree relative</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>both</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>Breast feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No breast feeding</td>
<td>20</td>
<td>36</td>
</tr>
<tr>
<td>&lt; 2 year</td>
<td>41</td>
<td>34</td>
</tr>
<tr>
<td>≥ 2 year</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>contraception</td>
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<td></td>
</tr>
<tr>
<td>Negative</td>
<td>79</td>
<td>27</td>
</tr>
<tr>
<td>Positive</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Menstrual status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No mense</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Regular</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td>Irregular</td>
<td>19</td>
<td>40</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>75</td>
<td>27</td>
</tr>
<tr>
<td>Positive</td>
<td>5</td>
<td>24</td>
</tr>
</tbody>
</table>

Table 3: Correlation of BMI with breast density

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mammographic density</th>
<th>Chi square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A no. (%)</td>
<td>B no.(%)</td>
</tr>
<tr>
<td>Non-obese</td>
<td>26 (18%)</td>
<td>71 (50%)</td>
</tr>
<tr>
<td>Obese</td>
<td>56 (35%)</td>
<td>67 (42%)</td>
</tr>
</tbody>
</table>

Discussion

The assessment of breast density is relatively easy on mammography and can be used as an important parameter for early intervention and prevention of breast cancer. Therefore, determination of the risk factors that may lead to increased density in mammography and evaluation of patients with these risk factors will be important key in the early detection of breast cancer.

This study showed that 27% of the women had dense breast. It is similar to that reported in Lebanon and Iraq being developing country, characterized by high fertility i.e. high parity which affect negatively the breast density.

Age was inversely related to density of breast. This finding is similar to that reported in Lebanon and Japan. The breast density decreases with increasing age. This seems logical because with aging, by the decreasing levels of ovarian hormone. The hormonal effect of ovary on breast tissue is reduced, which also results in the reduction of epithelial tissue of the breast tissue and its replacement with fatty tissue.

It was found that parity status was associated with breast density changes i.e. reduction in density of breast. This finding is consistent with that in Lebanon. Parity leads to changes in breast morphology, histology and biochemistry. This study showed that density of breast reduced dramatically when the parity is four and more. Other studies stated that parity was
positively associated with breast density.\textsuperscript{15,16} This difference might be explained by variations in methods of study, sampling and ethnic group.

No variation in mammographic density was noticed in family history of breast cancer.\textsuperscript{17} Some articles demonstrated that 1\textsuperscript{st} degree relative with breast cancer had significant association with breast density.\textsuperscript{18} It might be controversial, however, studies using BRCA1 and BRCA2 showed such association.\textsuperscript{19}

Longer duration of breast feeding was inversely significant associated with breast density. It is similar to that of other articles.\textsuperscript{20,21} This finding is inconsistent with that in Singapore, China and Korea.\textsuperscript{16,22,23} The difference might be attributed to the low fertility rates in regions of the studies. High fertility in Iraq might be responsible for such variation.

No significant relationship was observed between contraception usage and dense view. It is concordance with that in Iran.\textsuperscript{24}

No mense (natural menopause or by hysterectomy) was significantly associated with breast density. It is in agreement with that of Iranian study.\textsuperscript{24}

Smoking had no significant effect on breast density. It is in agreement with others.\textsuperscript{11,21} Evidence on the effect of smoking on mammographic density is controversial which might be due to timing of smoking (premenopausal or postmenopausal).\textsuperscript{25,26}

Body Mass Index (BMI) is significantly inversely associated with dense breasts. This is in agreement of that in other literatures.\textsuperscript{27} Obese women have a lower ratio of dense to fatty tissue in the breast. Direct correlation between BMI and the density was stated in other literatures.\textsuperscript{28}

\textbf{Conclusion}

Age, parity, breast feeding, menstrual status and BMI were related to breast density. Accurate interpretation of mentioned factors might increase the accuracy of mammography.

\textbf{Ethical Clearance:} Taken from Arab board of health specialization in Iraq/ executive office, Al Rusafa health directorate and administration of Al Elwiya Teaching Hospital were obtained.

\textbf{Source of Funding:} None

\textbf{Conflict of Interest:} Nil

\textbf{References}


Role of Inflammatory Cytokines and Immune Reactive Molecules in Pathogenesis of *Streptococcus Agalactiae* in Aborted Healthy Women

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Abstract

*Streptococcus agalactiae* has been appearing as a vital human pathogen and a gradually important cause of aggressive infections in immunocompromised adults and older, the aim of the study was to find the effect of inflammatory cytokine (interleukin 8) and immune reactive molecules (CD79 and CD54 molecules) on pathogenesis of *S. agalactiae* that isolated from aborted women. A total of 100 aborted women aged between (18 - 42) years, were involved in this study. Placentas specimens were cultured to isolate the *Streptococcus agalactiae*, the level of cytokine in the serum was measured by commercial ELISA tests, while CD molecules was estimated by immunohistochemistery assay. Our results showed that there was streptococcal isolates from Placentas specimens, Specific isolation and identification were done for *S. agalactiae*. Significant difference could be found in serum levels of inflammatory cytokine (P≤ 0.05) between these two investigated groups (infected and uninfected with *S. agalactiae*) in addition to high expression for CD79 and CD54 in infected women as compare with non *S. agalactiae* infected women.

Keywords: CD Molecules, inflammatory cytokines, placentitis, *S. agalactiae*

Introduction

*Streptococcus agalactiae* is Gram-positive, oxidase- and catalase-negative. *Streptococcus agalactiae* has been divided serologically into 9 serotypes (Ia, Ib, and II-VIII) due to various in capsular polysaccharide *Streptococcus agalactiae* or group B streptococcus (GBS) is a commensal organism in humans, but can cause life threatening infection in susceptible hosts such as neonates, pregnant women and non-pregnant adults with chronic illnesses¹. The structure of the human vaginal flora is precious by some host factors, plus, phase, high parity, health care workers, high Body Mass Index, chronic diseases as diabetes, sensual action, gestation and the custom of contraceptives, antibiotics, as well as separate ways such as antiseptic-douching sterility².

Group B *Streptococcus* (GBS) has become the major cause of bacterial infections in the perinatal period, including bacteraemia, amnionitis, endometritis, and urinary tract infection in pregnant women as well as focal and systemic infections in newborns. It is a relatively rare cause of infection in older children and non-pregnant adults³.

Macrophage and monocytes in neonatal blood and in the urinary tract respond to GBS with a pro-inflammatory cytokine release, involving Interleukin (IL) IL-1α, tumour necrosis factor (TNF) and IL-6. Interleukin-8 secretion is elevated by oxidative stress, which in that way causes the enrolment of inflammatory cells, induces a higher in oxidative stress mediators, producing important parameter in localized inflammation⁴. If a pregnant woman has high levels of interleukin-8, there is an important risk of schizophrenia in her progeny. The preterm labor is related with the raised uterine construction of pro-inflammatory cytokines, IL-1β IL-6, IL-8 and TNF, where believed to excite uterine action, either straight or through a rise in prostaglandin construction, the pull of leukocytes, and tissue transformation⁵. Decreasing the inflammatory penetrate or preventing cytokines discharge in these cells might be energetic in the dealing of preterm labor.
In the matching way, these mediators can cause abortion.

The CD79 particle forms part of the membrane immunoglobulin complex on B lymphocytes. CD79 itself is required for signal transduction. CD79 is found on all mature B lymphocytes in the blood stream, and on B lymphocytes at all phases of development in the bone marrow. CD79 appearance is absent after distinction of B lymphocytes into plasma cells.

**Materials and Method Materials**

Mastastrep kit was provided by Merseyside/UK. API strep kit and Vitek 2 system kit were supplied by BioMerieux/France company.

**Method**

**Samples collection.** - Clinical signs of aborted women were recorded by physician to show pregnancy period, and clinical sings.

- Aborted Placentas:

Hundred placenta samples from aborted women have been obtained, at maternity and children hospital of Al- Samawa, after curtag operation (by gynecologists) placenta samples were cultured as described by Sainì et al., isolation and identification of *S. agalactiae* was performed by API strep kit and Vitek 2 system kit then determent groups of isolates by Mastastrep kit, where *S. agalactiae* positive for group B.

**cytokine assessments** (IL-8) in serum were performed by ELISA kit: Provided by Elabscience\ China.

**Immunohistochemistry** for placenta specimens was performed as described by (Abcam, UK). The expression of CD79 and CD54 were measured as the same scoring system used by Mao et al., The positivity of cells for expression of CD79 and CD54 were seen as brown staining. It was graded as four grad of the cells staining positive for CD79 and CD54.

<table>
<thead>
<tr>
<th>Score</th>
<th>0</th>
<th>1+</th>
<th>2+</th>
<th>3+</th>
<th>4+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Cells</td>
<td>&lt;10%</td>
<td>10-25%</td>
<td>25-50%</td>
<td>50-75%</td>
<td>&gt;75%</td>
</tr>
</tbody>
</table>

**Statistical Analysis:** All data were analyzed using the statistical package for social science (SPSS) for Windows program on the computer. Chi-square was used to compare between the frequencies. Student t test was used to compare between means of groups. The significance was accepted as P value < 0.05.

**Results and Discussion**

**Clinical observation:**

Clinical signs in women included fever sweating, hypotension, pain, aches and bleeding most women infected with *S. agalactia* were aborted at first stage of pregnancy.

This result is in agreement with Young who found that *Brucella* transferred from mother through placenta to fetus during first stage of pregnancy and causes maternal bacteremia and spontaneous abortion.

-Bacterial isolation & identification:

Out of the 100 aborted women, 7(7%) were positive for culture after 2 days the *S. agalactia* culture recognized on the basis of colonial morphology on blood agar appeared as pinpoint , white to milky in color , Colonies of 1 to 2 mm in diameter and colonies showed β-hemolysis.

Isolates from blood and placenta samples were Gram-positive, cocci, arranged in short chain or small groups stained didn’t grow on macconkey agar and negative for catalase and oxidase

**Blood cytokine(IL-8) assessment:**

The results of this study showed a highly important increased (P<0.01) of IL-8 (93.88 ± 18.99) pg/ml in serum of aborted women infected with with *St. agalactiae*, compared with aborted women non infected with *St. agalactiae* (36.69±0. 95) pg/ml as shown in table(1). The result of current study same as reported by who discovered that highly significant increased (P<0.01) concentration of IL-8 (44.371± 8.772) pg/ml in serum of aborted patient at first month of gestation , control groups (non-pregnant women ) which were (7.423± 2.152) pg/ml , (6.908-+ 3.859) pg/ml respectively.

The inflammatory mediators, for instance IL-8, might show an important part in the contrivance of
protease-induced neurogenic irritation leading to effort or abortions by employing neutrophils and lymphocytes in the endometrium\(^{11}\).

While prior revision stated that female with natural abortions has significantly reduced plasma equal of IL-8, IL-6 and IL-11 compared to those with normal pregnancies\(^{12}\). The great equal of IL-8 in aborted female can be caused by the discharge of IL-8 from the endometrium\(^{13}\).

Table(1): The mean of IL-8 in aborted Woman infected &non and infected with st.agalactia

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Serum level of IL-8</th>
<th>Mean±SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>7</td>
<td>93.88±18.99</td>
<td>67.63</td>
<td>206.94</td>
<td></td>
</tr>
<tr>
<td>control</td>
<td>81</td>
<td>36.69±0.95</td>
<td>21.40</td>
<td>64.16</td>
<td></td>
</tr>
</tbody>
</table>

3. Immunohistochemical assay :

Histological section of placenta obtained from \(St . \ agalactiae\) infected women & non infected women revealed marked placentitis associated with \(St . \ agalactiae\) infection. chorionic villi showed necrotic changes of syncytial cells with extravascular accumulation of red blood cells in decidua and maternal blood spaces. there is infiltration of inflammatory cells (macrophages & neutrophils). Placentitis that occurred in placenta in the present study; necro-fibrinoid and necro-hemorrhagic type. in affected placenta, the trophoblastic epithelium lining the chorionic villi appeared necrotic with spreading of macrophage infiltration into mesenchyma of these villi. figure(1)

Fig( 1) Placenta of women infected with \(St . \ agalactiae\), showed fibrionoid deposits in the chorionic villi with degeneration and necrosis in the mesenchyma of these villi. Also there is scattered inflammatory cells (macrophage). H &E(100X).

Histopathological changes of placenta in aborted women positive for \(St . \ agalactiae\) infection showed conformity with clinical signs, cytokines and IHC assay results. where most of aborted placenta showed necrotic, hemorrhagic and had infiltration of macrophages this results was similar to that obtained by\(^{14}\) whom reported that Preterm delivery can occur when GBS has invaded the placental membranes decreasing the membranes tensile strength and elasticity causing it to rupture, it had also been suggested that GBS produces proteases that rupture plental tissue and similar mechanisms may promote membrane rupture causing miscarriage and preterm delivery. It has been shown that \(st . \ agalactiae\) may mostly attack the chorioamnion and amniotic fluid, improvement pass to the fetus, then start labor, lead to impulsive failure\(^{15}\).

GBS successfully impasses the extracellular matrix constituents fibronectin, fibrinogen and laminin, Strangely fine modified GBS fixes to restrained fibronectin to enable mucosal colonization, but not to soluble fibronectin that may aid as an opsonin for phagocyte respect\(^{16}\).

CD79 expression in placenta of aborted women infected & non infected with \(St . \ agalactiae\).

Result of immunohistochemical analysis demonstrated positive staining for CD79 in placenta of aborted woman as showed in (figure.2). It has been shown that aborted women positive for \(St . \ agalactiae\) infection showed high intensity for IHC staining of CD79 compared with that of negative for \(St . \ agalactiae\) infection which revealed low intensity for IHC staining of CD79 as show in (fig.2). Statical analysis with chi-square test, revealed that the total results of negative scores (1,2&3) in negative cases of \(St . \ agalactiae\) infection were pointedly developed (p≤0.01) than from negative cases. Mean while CD 79 intensity is significantly higher in positive cases. compared with that of negative cases. these score differences were also seen in (table 2).

Presence of CD54 molecules in placenta of aborted women infected & non infected with \(St . \ agalactiae\). According to study the CD 54 particles, stain was finished by anti-CD54 as seen in (fig.2). there is obvious rise for CD54 stain for placenta tissue through
St. agalactiae infection. as determined by staining of biopsies, the immune staining of CD54 were positive at high level in 85.71% (6 out of 7) in St. agalactiae infected patients, with highly statistical association (p≤ 0.05) between the infected & non infected groups (table 3). Result of our study showed significantly associated between ICAM-1 expression and cytokines, CD 79 and histopathological change.

Functional activation molecule (ICAM-1) is a cell adhesion molecule expressed on a cell and up-regulated by inflammatory mediators17. Several studies reported that ICAM-1 interaction not only is required for cell adhesion and migration, but also plays a key role in the immune response, in fact it involved in leukocyte function such as antigen-specific recognition by T lymphocytes, T lymphocytes activation, and Ig production through T-dependent immune response, thus higher expression of CD54 on T cells may reflect the activation state of lymphocytes18. We tried to determine the pathogenic importance of ICAM-1 through comparison of its expression in aborted women that infected & non infected with St. agalactiae. Our results made obvious that the strong up-regulation of both CD79 & CD54 give a strong evidence that lymphocytes in placental tissue were with in a state of immune dysregulation, that comes together with a study done by poriadia19 who showed that there is increased expression of activation induced antigens (CD54) on the peripheral blood lymphocytes from patients with various type of inflammatory disorders. Finally the high titer of cytokines (IL-8) and high expression of CD79 with profuse inflammatory cells in this study and other reports indicates that the St. agalactiae colonization in epithelial of placenta causing production of cytokines lead to tissue inflammation and damage by causing the recruitment of host immunity and activation of host leukocytes, macrophage & inflammatory cells. Progression along a Th1 & Th2 passageway in united up regulation for chemokines in tissue of placenta.

Figure 2. IHC staining results. A, B (expression of CD79) and C (expression of CD54): Women placenta positive for S. agalactia, specific staining of chorionic plate with DAB chromogen (brown) and counterstained with Hematoxylin (blue) (A:100x, B:400x). D: women placenta negative for S. agalactia; stained by DAB chromogen (brown) and counterstained with Hematoxylin (blue) notice, non IHC reaction for 3BHSD enzyme .100x.
Table (2) : Occurrence of CD79 molecule in placenta of aborted women (IHC assay).

<table>
<thead>
<tr>
<th>Score</th>
<th>Negative for St. agalactiae infection</th>
<th>Positive for St. agalactiae Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>28.57</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>71.42</td>
</tr>
<tr>
<td>Total of negative score</td>
<td>*100%</td>
<td>14.28%</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total of positive score</td>
<td>0%</td>
<td>85.71%</td>
</tr>
</tbody>
</table>

*Significant (p≤ 0.05)

Table (3) : Occurrence of CD 54 molecules in placenta of aborted women (IHC assay).

<table>
<thead>
<tr>
<th>Score</th>
<th>Negative for St. agalactiae infection</th>
<th>Positive for St. agalactiae Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>14.28</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>85.71</td>
</tr>
</tbody>
</table>

Score ;1< 25% ; 2(25-74)% ; (75-100)%

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the Faculty Scientific Committee (College of Education for Pure Science, University of Kerbala, Iraq) to Study the effect of Lycium barbarum Polysaccharide on bone and thyroid gland in hyperlipidemic healthy male albino rats.

References


Study The Effect of Healthy Biological Extracts Compared with Antibiotics on Some Bacteria Isolated from Infected Patients with Urinary Tract Infection

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Abstract

Phytotherapy is a substitute for antibiotics therapy in these days since resistance to many antibiotics used in treatment are increasing along with extraordinary cost of some antibiotics and side effect on patients. The Citrus limon, Punica granatum and daucus carota juice have anti-microbial properties. This study propose that Citrus limon juice may be more effective than some antibiotics used in the treatment of some urinary tract pathogens (Escherichia coli, Staphylococcus aureus and Proteus spp.) and Punica granatum juice have operative on Staphylococcus aureus and daucus carota juice have operative on Proteus spp. This study is generally careful an effective approach in the discovery of new anti-bacterial agents from Citrus limon, Punica granatum and daucus carota juice.

Keywords: urinary tract infection, Citrus limon, Punica granatum and daucus carota juice.

Introduction

Urinary tract infection (UTI) is one of the important common infectious diseases and is defined as the presence of bacteria in urine together with symptoms. UTI is one of the most generally happening bacterial infections among men and women1,2.

According to The National Institute for Health and Clinical Excellence (NICE) guidelines 'urinary tract infection is well-defined by a combination of clinical features and the occurrence of bacteria in urine'. The Clinical symptoms of UTI usually include frequency, dysuria, pyuria, abdominal pain, back pain, fever or urgency6,7. But none of these symptoms alone is sufficient to establish UTI diagnosis in veral patient7.

Appreciative the predominance of Urinary Tract Infection in various populations will help guide to the suitable level of suspicion and the appropriate work-up for urinary tract infection8. It is difficult to assess the accurate incidence of UTI due to under reporting; this situation is complicated as the correct diagnosis of UTI depends on both the presence of symptoms and positively urine culture9. Throughout childhood the risk of UTI is 8% for girls and 2% for boys10.

Circumcision status in males, peri-urethral flora, micturition disorders, bowel disorders, local factors, and hygienic measures are important factors involve in the pathogenesis of UTI. The pathogenicity of bacteria in UTIs is influenced by both bacterial and host factors like bacterial adhesion and motility, in addition to hosts immune response and genetic factors11.

UTI is mostly cause by gram negative aerobic bacilli originate in the gastrointestinal tract well-known as Enterobacteriaceae, Included the Escherichia coli (70-95%), Klebsiella 1-2%, Proteus species 1-2%, Staphylococcus 5-10%, Enterococcus species, Enterobacter, Citrobacter, and Serratia species1,3. Furthermore physicians need to know local patterns of microbial susceptibility in UTIs for proper drug selection depending on culture and sensitivity but the degrees of exposures of a populations to specific antibiotic could play a role in this variations4.

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Email: aqeelhayder88@gmail.com
Plants have continuous play a main role in the preservation of human health since ancient times like a sources of medicinals compounds. According to the World Health Organization plants extracts or their active components were used as folks treatment in traditions therapies of 80% of the world’s populations. Over 50% of all modern clinicals drugs are of natural products origins. Phytochemicals such as vitamins (A, C, E and K), caroteinoids, terpeinoids, flavionoids, polypheniols, alkailoids, taninins, sapionins, pigmients, enziymes and minerals that have anti-microbial and anti-oxidant activity.

Antimicrobiasl screenings of plants extracts and phyto-chemicals, then, represents a startings points for ant-imicrobial drugs discoverys. Phyto-chemical studies have attracteds the attentions of plants scientists due to the developments news and sophisticateeds methods. These methods playeds a significants roles in the searches for additionals resoiurces of raws maiterial for pharmiaceutical induistry.

**Materials & Method**

**Bacterial isolates:**

Differents clinicals microbials isoliates (Grams positives, Grams negatives bacterias) were isolateds and identified by using convsentional biochemicals tests and Api system and cultivatets in pures cultures, at microbiology laboratorys. These bacteria included: \( \text{(Escherachia colai, Staphylccoccus aureus, Priteus \text{spp.})} \)

**Antibiotic Sensitivity Test**

The anti-microbial susceptibility tests was performeded accordinces to Kirby-Bauer (disks diffusion) techniques using Muller-Hinton agar and different single anti-microbial disces provided commercially. Results are reads according to the National Committee for Clinical Laboratory Standards guidelines (NCCLS).

The diameters of inhibition zones for each individual anti-microbial agant was translated to terms of sensetive, intermedeate and resistant categoryes by referring to an interpretation chart of the National Committee for Clinical Laboratory Standards, subcommittee on anti-microbial susceptibility testing.

**Table: (1) Anti-microbial agents used and their concentration s per disc**

<table>
<thead>
<tr>
<th>Antimicrobial agent</th>
<th>Code</th>
<th>Conc-Mg/disc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Ampicillin</td>
<td>AM</td>
<td>20</td>
</tr>
<tr>
<td>2- Cefotaxime</td>
<td>CTX</td>
<td>30</td>
</tr>
<tr>
<td>3- Gentamycin</td>
<td>GM</td>
<td>10</td>
</tr>
<tr>
<td>4- Amikacin</td>
<td>AK</td>
<td>30</td>
</tr>
<tr>
<td>5- Erythromycin</td>
<td>E</td>
<td>15</td>
</tr>
<tr>
<td>6- Tetracyclin</td>
<td>TE</td>
<td>30</td>
</tr>
</tbody>
</table>

This study was carried out at the Department of pathological analysis / College Al Safwa University . The studies was conducteds durings the period from January 2016 untils February 2016.

**Source of plant extract**

The plants materiales useded in this studys consisted of \( \text{Citrus limon, Punica granatum and daucus carota.} \) These plants collected from a local market.

**Preparation of plant extract**

The fruit (\( \text{Citrus limon, Punica granatum and daucus carota} \)) was collected and washesd with steriles distilled water. Samples were crushed into partes and squeezed to remove the crude extract. The cruds extracts were filtered through filter peper and storid in sterile vials. The juice that used of \( \text{Citrus limon, Punica granatum and daucus carota} \) under study at concentretion (100%, 1:1, 1:2, 1:3).

**Determination of anti-bacterial activity**

The sensitivity studieis were conduicted using the Kirby and Bauer methods of sensitivity determinatios. Sterile Petri – dishes of Mueller Hinton agars were prepered according to manufaectures specification.

The wells diffusions method was used to scraen the anti-bacterial activity. In-vitro anti-bacterial assiay was screeaned by using Mueller Hinton Agar (MHA) obtained from Hi-Media, India. The MHA plates are prepered by pour 15ml of molten madia into hygienic Petri dishes. The Plates were allowed to solidify for 10 minutes and 0.1% inoculums suspension was swabbed uniformlyed and the inoculumis were allowed to dry
for 5 minutes. Wells (6 mm) were aseptical hit on the agar using a sterile corked borer letting at least 30 mm among adjacent wells. Fixed volumes of the plant extract were then introduced into the wells. The plates were then incubated at 37°C for 24 hours. The anti-bacterial action was evaluated by evaluating the diameter of the inhibition zone formed arounded the discs.

Results and Discussion

Antibiotic sensitivity

The results of the sensitivity test have shown that AK (30) was the most effective antibiotic on *Escherichia coli* (17 mm) and the other have less effective antibiotic on *Escherichia coli*, The CTX and SAM were the most effective on *Staphylococcus aureus* (27, 25 mm), and the CTX and TE were the most effective antibiotic on proteus spp. (35, 31 mm) respectively, SAM, GM and AK were have effectived on *proteus spp.* at (25 mm).

Table (2) show anti-biotics susceptibility results (zone of inhibition in mm) against *E. coli*

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Inhibition zones (mm) 24 hrs.</th>
<th>Escherichia coli</th>
<th>Staphylococcus aureus</th>
<th>Proteus spp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Ampicillin (AM)</td>
<td></td>
<td>13</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>2- Cefotaxime (CTX)</td>
<td></td>
<td>5</td>
<td>27</td>
<td>35</td>
</tr>
<tr>
<td>3- Gentamycin (GM)</td>
<td></td>
<td>13</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>4- Amikacin (AK)</td>
<td></td>
<td>17</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>5- Erythromycin (E)</td>
<td></td>
<td>5</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>6- Tetracyclin (TE)</td>
<td></td>
<td>6</td>
<td>13</td>
<td>31</td>
</tr>
</tbody>
</table>

Antibacterial of biologecal extracts

Results shown in table (2) indicate that the *Citrus limons* have inhibition against *E. coli* in the concentration 100% and low inhibition in concentration (1:1) and the other concentration have no inhibition, in additions the *Punica granatum* and *daucus carota* juice have no inhibition too. According to NCCLs cheat [48], the results referred to sensitivity of Proteus and *E. coli* for carrot juice, and resistant to *Staph. aureus* and the *Citrus limon* have inhibition against *Staphylococcus aureus* in the concentration 100% and low inhibition in concentration (1:1), (1:2) and *Punica granatum* (100%), (1:1) and *Staphylococcus aureus* resistant to other concentration and *daucus carota* juice.

Results show that the *Citrus limon* juice have effective on *proteus spp* at concentration (100%), (1:1), (1-2) and the *daucus carota* (100%), (1:1), and the *proteus spp* are resistant *Punica granatum* juice at all concentration.
Tables (3-4) show *Citrus limon*, *Punica granatum* and *daucus carota* juice results (zone of inhibition in mm) against *E.coli*

<table>
<thead>
<tr>
<th>biological extracts (juice)</th>
<th>Con.</th>
<th>Inhibition zones (mm) 24 hrs.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Escherichia coli</td>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>1- <em>Citrus limon</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>1:1</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>1:2</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1:3</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2- <em>Punica granatum</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>No</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>1:1</td>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>1:2</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>1:3</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3- <em>daucus carota</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>1:1</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>1:2</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>1:3</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

The anti-microbial activity of pomegranate fruit is related to phytocompounds present, predominantly alkaloids and tannins, among which stands out the punicalagin compound, ellagitannin with proven anti-microbial activity\(^\text{19}\). This finding agreed with Hayes and Markovic (2002)\(^\text{20}\) who investigated this anti-microbial properties of lemon and foundly this lemon possesses significant anti-microbial action against *S. aureus*, *Klebsiella*, *Escherichia coli*, *P. aeruginosa* and other. Also Al-Ani et al (2009)\(^\text{21}\), mentionied that *C. limon* have virtuous bacterial inhibition against *S. aureus*, *P. aeruginosa* and *P. vulgaris*.

The result of the study presented that the *Citrus limon* and *daucus carota* juice produced zones of inhibition against *proteus spp*. This shows the presences of effective anti-bacterial activity, which confirns its use as anti-infective. Carrots have many important vitamins and minerals. They are rich in antioxidants Beta carotine, Alpha carotine, phyto-chemicals and glutathione, calcium and potassium, and vitamins A, B1, B2, B6, C, D and E, which are also considured anti-oxidants and immune system booster\(^\text{22}\).

**Conclusions**

The anti-bacterial activities of *Citrus limon*, *Punica granatum* and *daucus carota* juice againsts urinary tract causing organism is reported and it showeds the effectives of theirs juice that are importent to the local market. Further phyto-chemical elucidutions are required to determined the nature of compounds responsible for the anti-bacterial effeted. This study is generally considered an effectied approach in the discovery of new anti-bacterial agents from *Citrus*.
limon, Punica granatum and daucus carota juice.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the Faculty Scientific Committee (University of Al Zahra for Girls, Iraq) to study the effect of healthy biological extracts compared with antibiotics on some bacteria isolated from infected patients with urinary tract infection.

References

[8] Sahi, R., Carpenter, C. Does This Child Have a Urinary Tract Infection?. Annals of Emergency medicine. 2008


Differences of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) of Moringa Leaf Extract (Moringa Oliefera L.) on Bacteria Aggregatibacter Actinomycetemcomitans and Porphyromonas Gingivalis

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Abstract

Background: Moringa leaves (Moringa oliefera L.) have many nutrients that contain bioactive components such as tannins, flavonoids, and saponins, as antimicrobials. The growth of Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis must be inhibited so that they do not become pathogens and cause periodontitis. Objective: The general purpose of this study was to determine the Minimum Inhibitory Concentration (MIC) and Minimal Bactericidal Concentration (MBC) and inhibitory power of moringa leaf extract (Moringa oliefera L.) against bacteria Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis. Method: The type of research used was laboratory experimental research. The design of this study is post test only control group design using the Kirby Bauer dilution method. With treatment extract concentration of 15%, 20%, 25%, 30%, 35% 100%, and positive control (Metronidazole). The measuring instrument in this study uses a caliper with millimeters (mm). Results: The results of the study of bacteria Porphyromonas gingivalis obtained from MIC by 20%, MBC 25% and bacteria Aggregatibacter actinomycetemcomitans obtained by MIC by 30% and MBC 35%. Kruskall Wallis test results showed that the value of p<0.05 so it can be concluded that there are significant differences in the inhibition zone of Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis. Conclusion: The extract of leaves of Moringa (Moringa oliefera L.) were able to inhibit bacterial growth Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis.

Keywords: Moringa leaves extract (Moringa oliefera L.), inhibitory power, bacteria Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis.

Introduction

Periodontal disease is one of the most common dental and oral health problems in the community. Based on Indonesia’s health profile in 2011, in 2010 there were 92,979 people who visited public hospitals belonging to the health ministry and local governments due to periodontal disease. Periodontal disease is an infection in the oral cavity that affects periodontal tissues. The main cause of this disease is microorganisms that colonize the surface of the tooth (bacterial plaque). Microorganism culture (bacteria) found in plaque shows the presence of certain gram negative bacteria in periodontitis.³

Periodontitis is an inflammation that affects the supporting tissues of a tooth, caused by microorganisms and can cause progressive damage to the periodontal ligament, alveolar bone and is accompanied by pocket formation.⁴ Periodontitis causes permanent tissue degeneration.
destruction characterized by chronic inflammation, migration of the fused epithelium to the apical, loss of connective tissue and loss of alveolar bone.6

The main causes of periodontal disease are the presence of microorganisms that colonize the dental plaque. Dental plaque is a structured, soft, yellow substance, which is attached to the tooth surface. The content of dental plaque is various types of microorganisms, especially the remaining bacteria are fungi, protozoa and viruses. Plaque containing pathogenic microorganisms plays an important role in causing and exacerbating periodontal infections.6

An increasing number of gram-negative organisms in subgingival plaques such as Porphyromonas gingivalis, Actinobacillus actinomycetemcomitans, Tannerella forsythia and Treponema denticola infect periodontal infection.7 Porphyromonas gingivalis is a gram-negative anaerobic bacteria involved in the pathogenesis of periodontitis and other inflammatory diseases that destroy dental support tissue. These bacteria can invade the periodontal tissues locally and survive the host defense mechanism by utilizing a panel of virulence factors that cause deregulation of innate immune and inflammatory responses.8 Aggregatibacter actinomycetemcomitans is a gram negative bacterium found in the oral cavity and one of the etiologies of aggressive periodontitis. This bacterium has the ability to produce leukotoxins which can cause damage to the periodontal tissues and one type of bacteria that is considered a periodontal pathogen.9 Inappropriate and excessive use of antibiotics can result in bacteria being Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis resistant to antibiotic drugs that have been given. The resistance of these bacteria to antibiotic drugs allows the use of herbal medicines from natural ingredients to be one of the other alternatives in the treatment of periodontitis. The use of herbal medicines from natural ingredients is generally considered safer than the use of modern medicine, because herbal medicines as traditional medicines have relatively fewer side effects than modern drugs.1

Natural ingredients used as herbal medicines one of which is Moringa leaves or known as the Latin name Moringa Oleifera. Moringa plants are efficacious as anti-cancer, anti-bacterial, hypotensive, inhibiting the activity of bacteria and fungi. This is related to the chemical content contained in it, which is rich in vitamin A and vitamin C, gluconic compounds and isothiocinates.10

Kelor leaves contain phytochemicals that make this plant capable of carrying out self-defense mechanisms. Phytochemicals contained include catechol tannins, galia tannins, steroids, triterpenoids, flavonoids, saponins, anthraquinones, alkaloids, and reducing sugars.11,12 The compound has the ability as a drug, its benefits are as antibiotics, skin care, anti-inflammatory, blood pressure, diabetes, and anemia.

Based on the description above, researchers are interested in conducting research to find out “The effect of Moringa leaf extract on bacterial growth, Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis cause periodontitis.”

Materials and Method

Type of research used in this study was a laboratory experimental study. The design of this study is post test only control group design using methods agar dilution and diffusion. This dilution method is used to determine the MIC (Minimum Inhibition Concentration) value, the lowest concentration that can inhibit the growth of test microbes. The diffusion method to be used to determine the activity of antimicrobial agents or often also called the inhibitory test. This method uses disk paper that has contained Moringa leaf extract and then put it into a culture medium.

The Kirby Bauer method was carried out in observing certain inhibitory zone diameters and producing a good batch-to-batch, resulting in satisfactory growth of the most pathogenic bacteria. The treatment was carried out 4 times with a concentration of 15%, 20%, 25%, 30%, 35% 100%. The positive control used is Metronidazole. The research tools used are petri dishes, round oases, autoclaves, bunsen, erlenmeyer flasks, suction pipettes, filter devices, rotary evaporators, filter paper, sterile cotton swabs, stationery.

The materials used in the research were (Moringa oleifera L.), test bacteria Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis. Obtained from the Laboratory of Hasanuddin University Faculty of Medicine, sterile distilled water, 96% ethanol, Metronidazole, Mueller Hinton Agar (MHA), label paper and aluminum foil.3 Samples of (Moringa oleifera L.) leaves were cleaned from the remaining dirt. After cleaning the moringa leaves are dried by air. After
drying, the sample is kept in a closed glass container. Oyster mushroom extract is obtained by maceration. The samples were in a closed container and then soaked with 96% ethanol solution and left for 5 days. After 5 days, the soaked sample is filtered using filter paper. The results of the filter are then evaporated using a rotary evaporator, so that a thick extract from the moringa leaf is obtained. The resulting thick extract is inserted into the vaporized container until all ethanol solvents evaporate.

Process of Testing Antimicrobial Effects of Diffusion Method

- 7 sterile test tubes were provided and Metranidazole. Dilution of the extract with sterile Aquadest was obtained to obtain concentrations of 15%, 20%, 25%, 30% and 35%, respectively as much as 5 mL.

- Each test tube is filled with the following conditions:
  
  Tube 1: 2.5 mL 15% extract + 2.5 mL suspension Porphyromonas gingivalis
  Tube 2: 2.5 mL 20% extract + 2.5 mL suspension Porphyromonas gingivalis
  Tube 3: 2.5 mL extract 25% + 2.5 mL suspension Porphyromonas gingivalis
  Tube 4: 2.5 mL 30% extract + 2.5 mL suspension Porphyromonas gingivalis
  Tube 5: 2.5 mL of 35% extract + 2.5 mL suspension Porphyromonas gingivalis
  Tube 6: 2.5 mL 100% extract + 2.5 mL suspension Porphyromonas gingivalis
  Tube 7: 500 mg Metronidazole + suspension Porphyromonas gingivalis (positive control)

- Each test tube is filled with the following conditions:
  
  Tube 1: 2.5 mL 15% extract + 2.5 mL suspension Aggregatibacter actinomycetemcomitans
  Tube 2: 2.5 mL of 20% extract + 2.5 mL suspension Aggregatibacter actinomycetemcomitans
  Tube 3: 2.5 mL of 25% extract + 2.5 mL suspension Aggregatibacter actinomycetemcomitans
  Tube 4: 2.5 mL 30% extract + 2.5 mL suspension Aggregatibacter actinomycetemcomitans
  Tube 5: 2.5 mL of 35% extract + 2.5 mL suspension Aggregatibacter actinomycetemcomitans
  Tube 6: 2.5 mL 100% extract + 2.5 mL suspension Aggregatibacter actinomycetemcomitans
  Tube 7: 500 mg Metronidazole + suspension Aggregatibacter actinomycetemcomitans (positive control)

Research Result

Minimum inhibitory effect of leaf extract Moringa (Moringa oleifera L.) against bacteria Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans.

The result of the tube dilution test is to see the turbidity level to determine the minimum inhibitory level. Tube dilution test results can be observed in Figures 1 and 2.
From the results of tube dilution test observations in Figure 1 the Minimum Inhibitory Level (MIC) can be determined in 30% tubes starting to look clear and Figure 2 Minimal Inhibitory Levels (MIC) can be determined on the tube 20% starts to look clear.

Minimal Bactericidal Concentration of leaf extract *Moringa oleifera* L. against *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans*. From the results of the diffusion test observations in Figure 3, the Minimal Bactericidal Concentration (MBC) seen at a concentration of 35% shows that there is no growth of bacteria *Aggregatibacter actinomycetemcomitans* and in Figure 4 the Minimal Bactericidal Concentration (MBC) can be determined at a concentration of 25%.

**Conclusion**

The conclusions of this study are:

Extract (*Moringa oleifera* L.) can inhibit the bacteria *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans*.

Minimal Inhibitory Concentration (MIC) of leaf extract (*Moringa oleifera* L.) *Moringa* which can inhibit bacteria *Porphyromonas gingivalis* is 20% with an average inhibition zone formed is 12.9 mm and for bacteria *Aggregatibacter actinomycetemcomitans* is 30% with an average zone inhibition of 10.2 mm.

The Minimal Bactericidal Concentration (MBC) of leaf extract killing (*Moringa oleifera* L.) which can inhibit bacteria *Porphyromonas gingivalis* is 25% with the average inhibition zone formed is 13.3 mm and for bacteria *Aggregatibacter actinomycetemcomitans* is 35% with zone average inhibition of 11.02 mm.

**Suggestions**

Need to be carried out further research on leaf extract (*Moringa oleifera* L.) with different methods to inhibit the growth of *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans*.

**Conflict of Interest**: There is no conflict of interest in this study.

**Source of Funding**: Domestic government

**Ethical Clearance**: This study obtained a label of ethics escaped by the number: 0082/PL09/KEPKFKG - RSGMUNHAS/2018 and register number UH 17120068 on Oktober 9, 2018.

**References**

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The Influence of Recitation “Murottal” Al-Qur’an to Anxiety Level Of Pre-Surgery Patients

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Abstract

Surgery is a stressor that can cause physiological stress (neuroendocrine response) and psychological stress (anxiety and fear). One of the non-pharmacological measures that can be used to reduce the level of danger by using the recitation therapy of the holy verses of the Qur’an (Murottal Al-Qur’an). This research was to discuss recitation “Murottal” Al-Qur’an to anxiety level of patient in Hospital dr. Wahidin Sudiro Husodo Mojokerto. In this research use Pre-experimental design with one group pre-test-post-test approach. A sample of 27 people taken a consecutive sampling. The variable in this research was recitation Al-Qur’an and dependent variable is in the face of pre-surgery. Data collection using Kession Depression, Anxiety, Stress Scale (DASS-42). The Wilcoxon Signed Rank Test test shows that p (0.000) < α (0.05), recitation “murrotal” Al-Quran Status Punishment for the preoperative level of hospitalization at RSU. dr. Wahidin Sudiro Husodo Mojokerto. Recitation Qur’an as spiritual therapy, can provide peace, reduce fear and get closer to God and strengthen spiritual belief. Besides being of spiritual value, from the aspect of the sound has fulfilled the music as a relaxation therapy, where solid music will release the release of endorphins that will affect a person’s mood. Listening to al-Qur’an reading regularly will calm the heart and lower the level of anxiety.

Keywords: Anxiety, Recitation “Murottal” Al-Qur’an Pre-surgery

Introduction

Surgery is a stressor that can cause physiological stress (neuroendocrine response) and psychological stress (anxiety and fear) (1). According to Volicer & Volicer cited by Rosintan in 2003, clients will perform high-stress surgery actions with clients who are proven without the cost of surgery. One of the most improved factors for clients is to make the clients themselves arrive outside the operation (2).

Their anxiety is usually associated with all kinds of different procedures that the patient must undergo and also the threat to the patient’s life safety due to all kinds of surgical procedures and anesthesia (3).

The Anxiety and Depression Association of America wrote that anxiety disorders are the most common mental illness in the United States, affecting 40 million adults in the United States aged 18 and older, or 18% of the population (4). It is estimated that every year there are 230 million major operations performed worldwide, one for every 25 people alive. In Indonesia, the prevalence of anxiety disorders ranges from 6-7% of the general population (women more than male prevalence).

Recitation Qur’an (listening to the recitation of the holy verses of the Qur’an) affects the decrease of depression, sadness, preventing various diseases, and obtaining peace of mind. Al-Qhadi, president of the Islamic Medicine Institute for Education and Research in Florida, USA. At the XVII Annual Conference of the American Physicians Association, the US missile territory, Ahmad Al-Qadhi made a presentation of his research results with the theme of the influence of the Qur’an on humans in the perspective of physiology and psychology. The results show a positive result that listening to the holy verses of the Qur’an has a significant influence in decreasing nervous tension and capable of bringing tranquility up to 97% for those who listen to it (5).
According to Clinn Exell (6) if the anxiety experienced by a person is sustainable, it will enter in vulnerable maladaptive response panic. Individuals who experience panic are unable to do anything even with directions. Panic will also lead to increased motor activity, decreased the ability to connect with others, perverted perceptions, and loss of rational thought. This level of anxiety is not aligned with life; if it persists for long periods of time, there can be fatigue and death.

Method

The research design used in this research is Pre-Experimental Design with One-Group Pretest-Posttest Design approach. The population in this study were all preoperative patients at Dr. General Hospital Wahidin Sudiro Husodo Mojokerto. With an average population of about 115 - 120 patients per month. Sampling using Nonprobability sampling technique that is consecutive sampling. The number of samples is 27 respondents. This study was conducted on February 1, 2017, starting from preliminary studies to taking research data from May 1, 2017, to May 14, 2017. The measurement tool used the DASS-42 questionnaire (Depression, Anxiety, Stress Scale). Data analysis to know the influence of 2 variables that is the independent variable and the dependent variable, using test statistic Wilcoxon signed rank test with software program SPSS 20.0.

Result

Specific Data

Table 1 is classified according to the level of respondents before marital therapy given al-Qur’an

<table>
<thead>
<tr>
<th>No</th>
<th>Anxiety level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Un anxious</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>Mild</td>
<td>11</td>
<td>40,7</td>
</tr>
<tr>
<td>3.</td>
<td>Medium</td>
<td>11</td>
<td>40,7</td>
</tr>
<tr>
<td>4.</td>
<td>Hard</td>
<td>5</td>
<td>18,5</td>
</tr>
<tr>
<td>5.</td>
<td>Heavy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1 shows that the respondent’s anxiety level before giving recitation intervention from 27 respondents who are on the level of mild and moderate anxiety are 11 respondents (40,7%), and severe anxiety five respondent (18,5%).

Table 2 Distribution of frequency of respondents based on the level of anxiety after being given recitation al-Qur’an treatment

<table>
<thead>
<tr>
<th>No</th>
<th>Anxiety level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Un anxious</td>
<td>3</td>
<td>11,1</td>
</tr>
<tr>
<td>2.</td>
<td>Mild</td>
<td>15</td>
<td>55,6</td>
</tr>
<tr>
<td>3.</td>
<td>Medium</td>
<td>9</td>
<td>33,3</td>
</tr>
<tr>
<td>4.</td>
<td>Hard</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>Heavy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 note that after given recitation intervention there is a change in client anxiety level, i.e., respondents who are not anxious (normal) there are three respondents (11,1%), respondents with minor anxiety counted 15 respondents (55,6), anxious was nine respondents (33,3%).

Table 3: Distribution of frequency of respondents based on anxiety levels before and after recitation therapy given al-Qur’an

<table>
<thead>
<tr>
<th>No</th>
<th>Anxiety level</th>
<th>Therapy Recitation Al-Qur’an</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>F</td>
<td>%</td>
<td>F</td>
</tr>
<tr>
<td>1.</td>
<td>Not anxiety</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>11,1</td>
</tr>
<tr>
<td>2.</td>
<td>Mild</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>55,6</td>
</tr>
<tr>
<td>3.</td>
<td>Medium</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>33,3</td>
</tr>
<tr>
<td>4.</td>
<td>Hard</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>Heavy</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

Table 3 shows that before the recitation al-Qur’an treatment intervention, it was found that no respondents were not anxious and after the respondent treatment was not anxious to 3 people (11.1%), before recitation intervention, the respondents were light anxious 11 of respondents (40,7%) and after recitation treatment were 15 respondents (55,6%), before recitation intervention,
respondents were worried about 11 respondents (40.7%) and after recitation treatment were 9 respondents (33.3%), prior to recitation intervention, respondents who were worriedly weighted as much as 5 respondents (18.5%) and after recitation treatment no respondents who experienced severe anxiety.

Wilcoxon signed rank test statistic shows p-value (0.000) < α (0.05), the Z value of the table is (-1.645), and Z value count 3.873 turns out bigger than -1.645, meaning H0 is rejected, so there is Influence therapy recitation against preoperative patient anxiety level in Kertabumi Room Dr. Hospital. Wahidin Sudiro Husodo Mojokerto.

Discussion

The anxiety level of the preoperative patient before being given Recitation Al-Quran therapy in Kertabumi Room of Dr. General Hospital. Wahidin Sudiro Husodo Mojokerto

Table 1 shows that the respondent’s anxiety level before giving recitation al-Qur’an intervention from 27 respondents who experienced light anxiety as much as 11 respondents (40.7%), medium anxiety as many as 11 respondents (40.7%), and anxiously weight five respondents (18.5%).

The anxiety level of the preoperative patient after Recitation Al-Quran therapy in Kertabumi Room of Dr. General Hospital. Wahidin Sudiro Husodo Mojokerto

Table 2 above shows that after intervention recitation al-Qur’an there is a change in client anxiety level, that is respondent that is not anxious (normal) there are 3 people (11.1%), lightly anxious counted 15 people (55.6%), anxiety was 9 people (33.3%) and no respondents who experienced severe anxiety. Five respondents who experienced severe anxiety before therapy, after being given therapy all respondents are on moderate anxiety, and of all respondents due to the experience of the operation, that is first.

So it can be assumed that this recitation therapy can decrease the level of anxiety, due to sound elements and music contained in recitation including in relaxation therapy.

The influence of Recitation Al-Qur’an on preoperative patient’s anxiety level in Kertabumi Room of Dr. General Hospital. Wahidin Sudiro Husodo Mojokerto.

Results of research based on table 3 influence of recitation therapy to decrease anxiety level in facing pre-operation in Kertabumi Room RSU. Dr. Wahidin Sudiro Husodo Mojokerto obtained decreased anxiety. In Wilcoxon signed rank test, the result showed that Z value equal to -3.873 and show p-value (0.000) < α (0.05). Price Z table is (-1.645), and the price of Z arithmetic -3.873 turns out to be greater than -1.645, then H0 is rejected, and H1 is accepted which means there is the influence of recitation al-Qur’an therapy to preoperative patient’s anxiety level at Kertabumi Rumah DR. Wahidin Sudiro Husodo Mojokerto.

Based on psychoneuroimmunology, anxiety is a stressor that affects the limbic system as the emotional regulatory center that occurs through a series mediated by HPA-axis (Hypothalamus, Pituitary, and Adrenal). Stress will stimulate the hypothalamus to increase Corticotropin Realizing Hormone (CRF) production. This CRF will further stimulate the anterior pituitary gland to increase the production of Adrenocorticotropin Hormone (ACTH). This hormone will increase the secretion of cortisol and catecholamine action (epinephrine and norepinephrine). This will respond to stress.

In the autonomic nerves, sound stimulus in the form of music causes the parasympathetic nervous system to be above the sympathetic nervous system that stimulates alpha brainwaves that produce a relaxed state. Music also causes the release of endorphins by the pituitary gland, thus affecting a person’s mood. A calm psychological state will affect the limbic system and autonomic nerves that cause relaxation, safe, and fun to stimulate the release of gamma amino butyric acid, enkephalin and beta-endorphins that will eliminate neurotransmitters pain and anxiety that create calm and improve mood patients.

So researchers have the assumption that recitation therapy can reduce the level of anxiety in the face of pre-operation. This is evidenced by the results of research before and after given recitation therapy because recitation therapy has an aspect that is needed in overcoming anxiety. The spiritual aspect found in this recitation therapy can be a contemplation of the existence of God, so it is expected to form positive coping and hope in the patient. And also the sound and music elements that exist are part of the relaxation therapy.
Conclusion and Suggestion

Conclusion

In a study conducted on May 1 - May 14, 2017, in the Kertabumi Room Dr. Hospital. Wahidin Sudiro Husodo Mojokerto on 27 respondents got a result from Wilcoxon signed rank test obtained Z value equal to -3.873 and show p-value (0.000) <α (0.05). Price Z table is (-1.645), and the price of Z arithmetic -3.873 turns out to be greater than -1.645, so Hou is rejected, so there is the influence of Murotal Al-Qur’an Therapy on Anxiety Level of Pre-Operation Patient in Room Kertabumi Hospital Dr. Wahidin Sudiro Husodo Mojokerto. Recitation Qur’an as spiritual therapy, can provide peace, reduce fear and get closer to God and strengthen spiritual belief.

Suggestion

It is expected that this recitation therapy can be used as an alternative independent nursing action that nurses can use to reduce anxiety levels in preoperative patients. This therapy should not be done once to be able to get optimal results

Conflict of Interest: The author of this study was entirely supported by the college and there was no any financial concern between the researchers during research. there was no any kind of conflicts were existing among the researchers while writing, peer review, and editorial decision making.

Source of Funding: It was not a funded research study.

Ethical Clearance: Ethical clearance is not applicable for this study as it is a narrative review.

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9. Morgan JI, Harris PR. Evidence that brief self-affirming implementation intentions can reduce work-related anxiety in downsize survivors. Anxiety, Stress Coping. 2015;
Molecular and Biochemical Study of Seven Pea (*Pisum sativum* L.) Cultivars through Using RAPDs, SSRs and Total Seed Protein by SDS-PAGE

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Abstract

**Background**: Cultivar identification is an essential step for crop improvement because it can direct plant breeders for suitable crossing to get heterosis, this study designed to use seed total protein, RAPDs and SSR to evaluate their ability in cultivar fingerprinting and identification.

**Materials and Method**: Seven pea genotypes with diverse origin were used. As biochemical marker, total seed protein extracted and profile established using SDS-PAGE. Genomic DNA extracted and used to examine ten of RAPDs primer and three SSRs were used as DNA markers and amplified by PCR followed by agarose gel electrophoresis, photographs and data analysis.

**Results**: Low genetic variation was observed using SDS-PAGE among studied genotypes. Primer OPA-04 successfully fingerprinted all genotypes. Primer PSMPA5 was the most efficient in all studied aspects among SSRs markers. No match observed between Phylogenetic analysis of RAPD and SSRs with genotypes origin.

**Conclusion**: Molecular markers proceed biochemical markers in fingerprinting and identification pea cultivars.

**Keywords**: Pea; SDS-PAGE; SSRs; RAPDs

Introduction

*Pisum sativum* L. is an annual herbaceous crop belongs to family Leguminosae refer to as garden pea, their seeds are consumed as dry or fresh vegetables in most countries and high in their sugar (12%), fiber, protein (about 19–27% in dry seeds) and vitamins with (2n=2x=14) chromosomes and genome size ~5000 Mbp, its next to soybean, groundnut and beans. Nowadays it’s become an alternative important source of protein to soybean in Europe, for its high nutritional value, the acceptance of pea proteins is increased. Pea beans contain biologically active components that may occupy therapeutic effects which are beneficial to health. Characterization of pea cultivars is achieved by several markers; biochemical (seed protein) and molecular RAPD, SSR, ISSR, SRAP etc. and morphological markers.

Generally studying genetic structure of germplasm by seed protein using (SDS-PAGE) is limited due to low polymorphism in most of the legumes in spite of its simplicity. Genetic variations at DNA level could evaluate degree of relationship among individuals without the influence of environmental factors. Randomly Amplified Polymorphic DNA (RAPD) technique is a PCR based DNA marker technology, its offer advantages include speed, technical simplicity, random coverage of genome and relatively higher level of polymorphism, their primers are simple arbitrary sequences of oligonucleotide with GC content of about 50%. marker systems is RAPD amplification. Application of SSRs markers in
plant has been accomplished for genetic variations, maize, tomato, soybean, Wheat and among pea genotypes, they were used for assessment genetic variation, an evolutionary studies, and to map loci responsible for the resistance to diseases or another important traits. Self-pollination in crops like pea lead to increase homozygosity in addition, that pea cultivars are possess narrow gene pool, genus *Pisum*, contains only four gene pools including *fulvum*, *abyssinicum*, *arvense* and *sativum* which increase the important of genotypes identification and genetic variation study for crop improvement.

**Materials and Method**

**Subjects:** Seven pea genotypes: 1-Sp12, 2-Vito, 3-GSN, 4-Onord, 5-P.V6-Nano, 7-Wp10 with diverse origin were used for biochemical and molecular study. Extraction of total seed protein was done by following procedure of. Preparation of sodium dodecyl sulfate-polyacryl amide gel was accomplished by method of at concentration of 12.5 percent, electrophoresis current was at voltage of 90 Volt, staining using coomaasie brilliant blue solution continue for about overnight while destaining continued till bands clearly visualized in white fluorescent light.

DNA extraction: Apical fresh leaves of seedling at age of four weeks were used for genomic DNA extraction using Genomic DNA Mini Kit (Geneaid Biotech. Ltd; Taiwan Company).

Ten operon primers A,B and C series were used. Amplification programmed as reported by for primers (OPA-01, OPA-02, OPA-03, OPA-04, OPA-10 and OPA-19) while primers (OPB-17, OPB-18, OPC-08 and OPC-09) as reported by later the amplified fragments were electrophorized at 70 V using agarose gel 1.2% for an 2-3 hours. **SSR markers:** Three simple sequence repeats were used. The PCR reaction initiated at 95°C for 10 min, later, 35 cycles started with 94°C for 30 s, 60°C for 30 s and 72°C for 30 s at. Final extension step was at 72°C for 5 min. PCR product was electrophorized at 70 V using agarose gels at concentration of 2.5% for an hour and half. Primers name and sequence illustrated in table(1).

**Table 1 : RAPD and SSR primers with their sequence**

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence(5’-3’)</th>
<th>Primer</th>
<th>Sequence(5’-3’)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSMPA5</td>
<td>F. GTA AAG CAT AAG GGG ATTTC AT</td>
<td>OPB-17</td>
<td>AGGGAACGAG</td>
</tr>
<tr>
<td></td>
<td>R. CAG CTT TTA ACT CAT CTG ACA CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSMSAA476</td>
<td>F. TAG TTT TGA ACT TTG GCC GTA T</td>
<td>OPB-18</td>
<td>CCACACGAGT</td>
</tr>
<tr>
<td></td>
<td>R. CAC ACC CTA ATC TAG GCT ATC C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X51594</td>
<td>F. CAA CCA GCC ATT ATA CAC AAA CA</td>
<td>R. GGC AAT AAA GCA AAA GCA GA</td>
<td>OPC-08</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPA-01</td>
<td>CAGGCCCCCTTC</td>
<td>OPC-09</td>
<td>CTCACCGTCC</td>
</tr>
<tr>
<td>OPA-02</td>
<td>TGCCCGAGCTG</td>
<td>OPC-19</td>
<td>GTTGCCAGCCC</td>
</tr>
<tr>
<td>OPA-04</td>
<td>AATCGGGGCTG</td>
<td>OPA-03</td>
<td>AGTCAGCCAC</td>
</tr>
<tr>
<td>OPA-10</td>
<td>GTGATCGCAG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Results

**Total seed protein:** Protein profile resulted in 13 bands ranging in their weight 17-75 KDa, out of them 12 were monomorphic, one unique and no polymorphic bands. Dendrogram grouped pea genotypes in two main groups, the first include only sp12 while the other included the rest genotypes as shown in figure (1).

**RAPD Markers:** Results showed that fragment molecular size in bp ranged 132-2326, high value for main bands (19) and seven unique bands produced by OPA-02, while OPA-04 gave high amplified bands (81). OPB-17 gave the highest value for polymorphic bands, polymorphism(%), primer efficiency and discriminatory value(%). Primer OPA-04 produced unique fingerprint for all studied genotypes while both OPC-01 and OPC-19 failed in giving any unique fingerprint for all studied genotypes. As shown in figures (2) and (3).

**Statistical analysis:** For RAPD markers Data scoring as presence of a product (1) and absence (0), then entered into PAST statistic vital program, version 62.1. While The resulting SSR markers data were analysed using Power Marker V.3 software (http://www.powermarker.net) to calculate the number of alleles, heterozygosity and polymorphic information content (PIC).
Phylogenetic analysis showed that all genotypes grouped together except Onord, clustering not concerned with their origin. Highest and lowest genetic distance were 0.43858 and 0.16427 respectively. SSR Markers: Results showed that marker PSMPA5 was the most efficient among used primers for most studied aspects. Molecular size of alleles produced by markers ranged between 142 bp-391bp. Figure (4) show the agarose gel electrophoresis of SSRs amplification product.

Phylogenetic analysis showed that studied genotypes divided between two main clusters, the first large one included P.V, Nano, Wp10 and Sp12 while the other small one included Vito, GSN and Onord neglecting their origin.

![Figure 4: Agarose gel electrophoresis of amplification product of primers PSMPA5, PSMSAA476 and X51594](image)

Discussion

High similarity with identical protein profile may resulted from the conservatization nature of seed protein. Despite high similarity (low polymorphism) in these patterns, they could be as general biochemical fingerprinting, especially changing in these profile in response to biotic and a biotic stresses. Establishment of relationship between cluster pattern and origin sometimes difficult, this might refers to that protein profiles data may related to agronomic traits. Variation among primer polymorphism concerned with number of polymorphic bands which is related to number of binding sites recognized by a primer because of loss or alteration (deletion or insertion) of nucleotide sequence changes (e.g. point mutation). Monomorphic bands refer to identical sequences are constant in genome or commonly refer to as sequence conservation. Unique fingerprint produced by some primers may related to variation in morphological traits which produce diverse RAPD patterns. The ability of primer PSMPA5 in producing high PIC value was recently reported by, while disagree for primers PSMSAA476 and X51594, this may belong to variance in characteristic of studied germplasm recognized by particular prime. SSR phylogram can be for building of breeding plans because the fact that crosses between closely related genotypes are less efficient to produce heterosis.

Conclusion

Molecular markers proceed biochemical markers in fingerprinting and identification pea cultivars especially primers OPA-04 and Primer PSMPA5.

Declaration of Interest: There was no declaration of interest in this study.

Source of Funding: Source of funding for this project was by the author himself.

Ethical Clearance: Taken from Zayed University

Acknowledgement: Very special thanks to all members at Administration of Agriculture in Najaf, Coated Agriculture project and Institute of Seed Examination and Certification in Ministry of Agriculture for their endless help

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Histological Study of Hypothyroidism Induced Effect by Methimazole on Heart and Blood Vessels of Healthy Female Rabbits

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Abstract

The study was designed to investigate the effect of hypothyroidism induced by methimazole drug on blood vessels and heart tissues histology of female rabbit. The experiment has included twenty adult female rabbit weighing 1500-2000 gm. They were divided into two groups (10 rabbit/group) as follows. Group one (G1) was a control group, ten female rabbits Water and regular food were given as a positive control group. Group two (G2) ten female rabbits were orally received only methimazole (0.02 mg/kg B.W). Histological sections revealed significant changes in the heart and blood vessels. Such changes include endothelium enlargement and thickening of lining of the vessel, hyperplasia, infiltration of inflammatory cells and fatty vacuoles in tissue cells.

Keywords: hypothyroidism, methimazole, heart, blood vessels, female rabbits.

Introduction

Thyroid gland is a butterfly shaped endocrine gland responsible for secretion Thyroxin (T4) and triiodothyronine (T3) hormones that have an important role in cell metabolism. The gland is representing the basis for energy generation by increasing the metabolic rate in the body. As a matter of fact, it controls the functions of the body as a whole, and regulate growth by increasing the rate of chemical reactions and stimulate metabolic activity in the body. Triiodothyronine (T3) and Thyroxin (T4) are the only amine containing hormones in vertebrates which contain iodine. They are the basic hormones considered to be important regulators of growth, differentiation, proliferation and metabolism of most tissues and organs. Clinical studies of hypothyroidism have shown a possible association between metabolic syndrome, obesity, and impaired lipid metabolism.

The hypothyroidism is a common disorder in the endocrine system, when the thyroid does not produce enough of its own hormones, or it might be an inactive gland which is unable to make enough hormones to maintain the activity of the body. Hypothyroidism causes inactivity and poor coordination of the motor function. It is often associated with low memory, especially in the elderly and loss of cognitive functions. Low thyroid function is a risk factor that increases the risk of atherosclerosis due to significant changes in fat metabolism, resulting in increased blood fat.

Methimazole as a drug inhibits thyroid peroxidase from conjugation in the stimulating reactions of Iodine tyrosine bindings but does not affect the process of converting iodine to oxidized form during the Iodination process, thereby limiting the production of thyroid hormones.

To investigate the harmful effect of hypothyroidism induced by Methimazole on some histological change in heart and blood vessel tissue.

Materials and Method

Animals and experimental design:

Twenty adult female rabbits, eight months old and mean body weight of 1.5-2 kg were used. The study was conducted at the animal house of Pharmacy college.
during summer of 2018. Ten rabbits were randomly designed to each of the 2 groups (G1, G2). Water and regular food were given for both groups. The rabbits of the control were maintained for the same water and food for the whole period of the experiment which lasts for four weeks. For group two (G2) as a treated group, the rabbits were given Methimazole drug (an Irish product produced by SAS). The drug was administered by gastric intubation with a dose of 0.02 mg/kg body weight for 4 weeks daily. The stock solution was prepared by dissolving one tablet (5 mg) of Methimazole to 250 ml of distilled water, as each 1 ml of solution contains a 0.02 mg concentration of the drug according to Amber et al. At the end of the experiment, the animals were euthanized and the samples were collected. The sample was initially saved after being removed from the animal in the formalin solution at a concentration of 10%. After four to five days it was extracted from formalin and washed several times with tap water and then preserved at ethyl alcohol at 70% concentration. It was then conducted a series of preparations.

**Histological sections**: were prepared according to the method described in (9)

**Results**

The heart sections of the control group showed normal histological structure to the epicardium and myocardium of ventricle with purkinje fibers(Figure 2).

The main microscopic findings in animals treated with 0.02 mg/kg of Methimazole are characterized by several vacuolation of muscle cells with dilation and Congestion of blood vessels in myocardium of ventricle (Figure 3). There is also Increase in volume of myocardium fibers (Figure 4). On the other hand, the histopathological examination of veins in treated group showed endothelium enlargement and thickening of blood vessel wall (Figure 5). there are fatty vacuoles can be observed(Figure 6). The results also showed hyperplasia in the blood vessel wall (Figure 7) beside wall thickening and infiltration of inflammatory cells (Figure 8). Also the sections revealed to the projection of endothelium inside the lumen of the vessel (Figure 9).
Figure (3) Histological change in heart of female rabbit in group treated with 0.02 mg/kg of Methimazole showed Increase in volume in myocardium fibers (H&E stain, 10X).

Figure (4) Histological change in treated with 0.02 mg/kg of Methimazole Showed Enlargement and thickening endothelium of blood vessels and Showed fatty vacuoles (H&E 40X).
Discussion

Thyroid hormones contribute to blood flow by increasing the rate of cardiac output by increasing the rate of heartbeat and the occurrence of hypothyroidism, which was created by a drug that is reflected in the body’s vital functions, including metabolism and regulation of the circulatory system. A drug is used to develop hypothyroidism in laboratory animals by inhibiting the work of an enzyme that binds iodine with the amino acid and then linked with the thyroid follicles, which is an important step for the production of thyroid hormones.

The oral dosage of a drug for one month led to changes in the tissue of the lining of the blood vessel such as hyperplasia and thickening in endothelia and infiltration of inflammatory cells.
as the appearance of fatty vacuoles and foamy cells, and the thickening and irregularity of the endothelium. This is consistent with the cause of damage to internal artery lining to the oxidative stress resulting from the rise in concentrations of many effective oxygen roots such as hydroxyl radicals, superoxide and hydrogen peroxide and in quantities exceeding the capacity of antioxidant tissue defenses to get rid of These roots cause damage and vandalism in the tissues as this drug has a role in causing oxidative stress and the generation of free radicals and damage in the tissues of the body accompanied by an increase in the stench of tissue leading to degradation Polyunsaturated fatty acids resulting in damage to the body’s various tissues. The mechanism of appearance of the tissue lesions represented by the oxidation of LDL-C fatty acids, ox-LDL-C molecules by phagocytic cells and the formation of foamy cells with adhesion and penetration of the monocytes of the vessel wall The formation of cytokines, the growth factors, the migration and proliferation of smooth vascular muscle cells, as well as the formation of vascular lesions accompanied by fibrosis and thrombosis.

The presence of thickening in the wall of the blood vessel is due to the proliferation of smooth muscle cells of the vascular stage of reproduction and then the emergence of fatty deposits due to the damage of the lining, which is followed by inflammatory infiltration to the vent under the lining to eat the molecules of low density lipoprotein oxidizing the formation of foamy cells and programmed death of these cells. To the formation of fatty threads.

The increase in blood cholesterol due to the oral dosage of a drug for a month lead to imbalance of the blood supply of the heart through the blood oxygenation, which leads to narrowing of the coronary arteries and closure and thus the occurrence of blood ischemia, which leads to the generation of free radicals that act on the oxidation of fat to the cell membrane and Membrane collapse and death of myocardial cells due to lack of oxygen.

**Conflict of Interest:** This research is a personal non-profit work and there is no conflict of interest.

**Source of Funding:** None.

**Ethical Clearance:** Ethical clearance was obtained from the Faculty Scientific Committee (College of Education for Pure Science, University of Kerbala, Iraq) to study of the histological hypothyroidism induced effect by methimazole on heart and blood vessels of healthy female rabbits.

**References**


Prevalence of Depression among Mothers of Children with Type 1 Diabetes Mellitus attending two Diabetes Centers

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Abstract

Objective: This study aimed to measure the prevalence and to identify predictors of depression among mothers of children with type 1 diabetes mellitus.

Method: A cross-sectional study was carried out on 30 healthy control mothers and 100 mothers of type 1 diabetes mellitus children who met the inclusion criteria. The Arabic version of the 9–statement Patient Health Questionnaire used for screening of depressive symptoms.

Results: The prevalence of overall depression reported among the mothers of diabetic children was (95%). The mean 9–statement Patient Health Questionnaire score for depression was significantly higher in mothers of diabetic children (13.4 ± 5.0) compare to control group (7.57 ± 3.01). No depression and mild depression were more prevalent among control group when compared to case group; while, the moderate depression, moderately severe depression and severe depression were more prevalent among mothers of diabetic children compared to control group. Only education level appear as predictor of depression in mothers of diabetic children in which higher education levels had increased risk of depression.

Conclusions: The presence of diabetes as a chronic illness in children is a risk factor for developing depression by the child’s mother.

Keywords: depression, diabetic children, maternal depression, patient health questionnaire-9 (PHQ-9).

Introduction

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia due to defects in insulin secretion and/or insulin action¹. The worldwide prevalence of diabetes in 2010 was about 280 million, predicted to increase by the year 2030 to about 440 million². Type 1 diabetes mellitus (T1DM) represents about 5 to 10% of the total cases worldwide³. T1DM resulted from immune-mediated pancreatic β-cells destruction⁴. Depression is a worldwide high prevalence condition; about 340 million people complaining of depression globally⁵. Depression is the leading cause of disability and the fourth leading cause of the global burden of disease on the World Health Organization (WHO)⁶. Diabetes mellitus, like other chronic diseases, can cause a serious inquietude in children as well as in their family⁷,⁸. The high diabetes-related stress are frequently associated with increased risk for depression and anxiety among mothers of children with diabetes⁹, with clinically significant symptoms reported in about 20–30% of mothers¹⁰,¹¹. Maternal depression was more commonly reported in the literature than the paternal depression¹². Knowing depressive status could aid health care professionals in helping parents address the feelings of frustration, burnout, and vulnerability¹². The aim of this study was to measure the prevalence and to identify predictors of depression among mothers of children with type 1 diabetes mellitus.

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DOI Number: 10.5958/0976-5506.2019.02011.4
Subjects and method

Study design and participants

A cross-sectional study carried out from April 2017-to March 2018, on 30 healthy control mothers (age 32.6 ± 9.05 years) and 100 mothers of T1DM children (age 32.62 ± 8.06 years) who attended two diabetes centers in Baghdad/ Iraq (The National Center for Diabetes Treatment and Research, Al-Mustansiriyah University, and the Specialized Center for Endocrinology and Diabetes, Ministry of Health).

Inclusion criteria:

Any mother having a type 1 diabetic child (age ≤ 12 years) for more ≥ 1 year who will accept to participated in the study.

Exclusion criteria:

1-Any mother with diabetic child above 12 years or having the disease for less than 1 year.

2-Mothers who take antidepressant drugs, or being on treatment for any neurological or psychological diseases.

Data collection

The data were collected using a data collection sheet designed for the purpose of the study; the following information was recorded for each participant:

1-Demographic data related to mothers: age, residency, education, and number of children.

2-Demographic and disease characteristics of patients (T1DM children): age, duration of disease, number if insulin daily dose, and number of hospital admissions during the previous six months.

3-Questionnaire: The Arabic version of the 9–statement Patient Health Questionnaire (PHQ-9) was used for screening of depressive symptoms; The PHQ-9 is a multipurpose instrument for screening, monitoring and measuring the severity of depression; it is brief and useful in clinical practice. A score (ranging from 0 to 3) is given for each of the 9 statements; the sum of the total scores gives the provisional diagnosis for depression as shown in (table-1).

Table-1. PHQ-9 score and provisional diagnosis of depression

<table>
<thead>
<tr>
<th>PHQ-9 Score</th>
<th>Professional diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>No depression</td>
</tr>
<tr>
<td>5-9</td>
<td>Mild depression</td>
</tr>
<tr>
<td>10-14</td>
<td>Moderate depression</td>
</tr>
<tr>
<td>15-19</td>
<td>Moderate-severe depression</td>
</tr>
<tr>
<td>20-27</td>
<td>Severe depression</td>
</tr>
</tbody>
</table>

Statistical Analysis

Continuous data presented as mean ± standard deviation while categorical variables presented as mean and their percentage, independent t-test used to compare two continuous data while chi square test used for categorical variables. Binary logistic regression used to assess the relationship between different predictor in patients with depression, SPSS 22.0.0 (Chicago, IL) software package used to make the statistical analysis, p value considered when appropriate to be significant if less than 0.05.

Results

The personal characteristics of the participants enrolled in the study are shown in (table-2) where there were no significant differences between the mothers of diabetic children and the control group in age, education and residency.
Table-2: Assessment of baseline characteristics between mothers of diabetic children and control group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control</th>
<th>Patients</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Age (years), mean ± SD</td>
<td>32.6 ± 9.05</td>
<td>32.62 ±8.06</td>
<td>0.991</td>
</tr>
<tr>
<td>Education level, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>1 (3.33%)</td>
<td>12 (12%)</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>7 (23.33%)</td>
<td>27 (27%)</td>
<td>0.289</td>
</tr>
<tr>
<td>Secondary</td>
<td>16 (53.33%)</td>
<td>51 (51%)</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>6 (20.0%)</td>
<td>10 (10%)</td>
<td></td>
</tr>
<tr>
<td>Residency, n (%)</td>
<td></td>
<td></td>
<td>0.417</td>
</tr>
<tr>
<td>Urban</td>
<td>23 (76.67%)</td>
<td>69 (69%)</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>7 (23.33%)</td>
<td>31 (31%)</td>
<td></td>
</tr>
</tbody>
</table>

SD: standard deviation, n: number

The prevalence of overall depression reported among the mothers of diabetic children was (95%). Mean PHQ-9 score for depression was significantly higher in case group (13.4 ± 5.0) compare to control group (7.57 ± 3.01). No depression and mild depression were more prevalent among control group when compared to mothers of diabetic children group; while, the moderate depression, moderately severe depression and severe depression were more prevalent among mothers of diabetic children group compared to control group, as illustrated in table-3.

Table-3: Assessment of depression between mothers of diabetic children and control group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control</th>
<th>Patients</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Median PHQ-9, mean ± SD</td>
<td>7.57 ± 3.01</td>
<td>13.4 ± 5.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Depression, n (%)</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No depression</td>
<td>5 (16.66%)</td>
<td>5 (5.0%)</td>
<td></td>
</tr>
<tr>
<td>Mild depression</td>
<td>15 (50.0%)</td>
<td>20 (20.0%)</td>
<td></td>
</tr>
<tr>
<td>Moderate depression</td>
<td>10 (33.3%)</td>
<td>38 (38.0%)</td>
<td></td>
</tr>
<tr>
<td>Moderately severe depression</td>
<td>0 (0.0%)</td>
<td>25 (25.0%)</td>
<td></td>
</tr>
<tr>
<td>Severe depression</td>
<td>0 (0.0%)</td>
<td>12 (12.0%)</td>
<td></td>
</tr>
</tbody>
</table>

SD: standard deviation, n: number

Only education level appear as predictor of depression in mothers of diabetic children group in which higher education levels had increased risk of depression (7.7 folds), while the rest of variables show no relationship with depression, as illustrate in table-4.


Table 4: Assessment of predictor of depression in mothers of diabetic children.

<table>
<thead>
<tr>
<th>Variables</th>
<th>No depression</th>
<th>Depression</th>
<th>OR (95%CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 5</td>
<td>N = 95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (y), mean ± SD</td>
<td>34.4 ± 10.9</td>
<td>32.5 ± 8.0</td>
<td>0.971 (0.867 – 1.088)</td>
<td>0.612</td>
</tr>
<tr>
<td>Education level, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>3 (60.0%)</td>
<td>9 (9.5%)</td>
<td>7.650 (1.714 – 34.135)</td>
<td>0.008</td>
</tr>
<tr>
<td>Primary</td>
<td>2 (40.0%)</td>
<td>25 (26.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>0 (0.0%)</td>
<td>51 (53.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>0 (0.0%)</td>
<td>10 (10.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residency, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>4 (80.0%)</td>
<td>65 (68.4%)</td>
<td>1.846 (0.198 – 17.231)</td>
<td>0.591</td>
</tr>
<tr>
<td>Rural</td>
<td>1 (20.0%)</td>
<td>30 (31.6%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child age (y), mean ± SD</td>
<td>7.4 ±3.0</td>
<td>7.4 ± 3.1</td>
<td>0.998 (0.745 – .337)</td>
<td>0.988</td>
</tr>
<tr>
<td>Duration (y), mean ± SD</td>
<td>2.4 ± 1.3</td>
<td>2.8 ± 1.6</td>
<td>1.176 (0.609 – 2.271)</td>
<td>0.629</td>
</tr>
<tr>
<td>Number of daily doses, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two</td>
<td>4 (80.0%)</td>
<td>58 (61.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three</td>
<td>1 (20.0%)</td>
<td>36 (37.9%)</td>
<td></td>
<td>0.405</td>
</tr>
<tr>
<td>Four</td>
<td>0 (0.0%)</td>
<td>1 (1.1%)</td>
<td>2.545 (0.282 – 22.971)</td>
<td></td>
</tr>
<tr>
<td>Number of hospitalization, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>4 (80.0%)</td>
<td>27 (28.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once</td>
<td>1 (20.0%)</td>
<td>34 (35.8%)</td>
<td>6.455 (0.881 – 47.320)</td>
<td>0.067</td>
</tr>
<tr>
<td>More than once</td>
<td>0 (0%)</td>
<td>34 (35.8%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Binary logistic regression
Discussion

Diabetes mellitus is a common metabolic disorder with medical and economic consequences. The Arab world will have the second highest increase in the percentage of people with DM in 2030 compared to other parts of the world\(^\text{4}\). Diabetes was an emerging epidemic in Iraq. There were 1,411,500 cases of diabetes in Iraq which represent 7.5% of total population in 2017\(^\text{7}\). This study intended to throw light on the important aspect of a common health problem in Iraq. The results have clearly shown that depression was significantly higher and more severe among mothers of diabetic children than in controls. The results of the current study showed that prevalence of (no depression) and mild depression were higher among control group compared to mothers of diabetic children. In contrast, moderate depression, moderately severe depression, and severe depression were more prevalent among mothers of diabetic children compared to control group. However, the mean PHQ-9-score of mothers of diabetic children was significantly higher than that of the control group. Surprisingly noticed, the high prevalence of mild depression (50.0 %) and moderate depression (33.3%) among the control group. Health Survey was carried out in 2006–2007 which studied the epidemiology of major depressive episode (MDE) in the adult Iraqi general population and found that MDE is a common mental disorder in Iraq, affecting around 475,000 Iraqi adults, of which 46% are severe or very severe cases\(^\text{16}\). Regarding the depression among the mothers of diabetic children, the results of the current study are consistent with that reported in other studies where a high incidence of psychiatric problems among the parents of diabetic children was observed in a Swedish study\(^\text{17}\). In a similar Scottish study, the mothers of diabetic children were found to be more depressed and anxious than mothers of the control group\(^\text{18}\). While fathers have an important role in caring children with diabetes\(^\text{19}\), mothers are usually the parents responsible for the most of treatment management\(^\text{12, 20}\). Accordingly, mothers may experience greater psychological stress than fathers when caring a child with diabetes\(^\text{12, 21, 22}\). Mothers also report constantly worrying about their hyper- or hypoglycemia, food management, insulin administration, blood glucose monitoring, and long-term complications\(^\text{22, 23}\). Maternal stress and depressive symptoms are linked with negative outcomes, including deteriorating glycemic control, poorer quality of life, and greater depressive symptoms\(^\text{24-26}\). The prevalence of overall depression reported among the mothers of diabetic children in the current study (95%) was higher than that (75.4%) reported by Maryam et al (2016) among Iranian parents of children newly diagnosed with T1DM\(^\text{27}\). Only education level appear as predictor of depression among mothers of diabetic children in which higher education levels had increased risk of depression (7.7 folds). This may be due to that educated mothers may have better knowledge about long-term complications of diabetes which may lead to higher depressive symptoms among them compared to lower educated mothers.

Study limitations

The study had some limitations. First, small sample size of the participants. Second it was conducted in only one city of Iraq (Baghdad), therefore, the findings and conclusions of the study should not be generalized to Iraq\(^\text{4}\).

Conclusion

In conclusion, the results of the current study clearly indicates that the presence of diabetes as a chronic illness is a risk factor for developing depression by the child’s mother. Such findings are important to the practicing health care workers, as such aspects of the disease are not well taken care of in the clinics.

Conflict of Interest : None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by college of pharmacy, Baghdad University.

Source of Funding: The workers was supported by authors only

Acknowledgment: The authors are grateful to the college of pharmacy university of Baghdad, college of pharmacy university of Al Mustansiriya, and the Specialized Center for Endocrinology and Diabetes medical staffs, for helping carrying out this work. Also we would extend our thanks to the parents and their children who participated in the study.

References


Effect of Leadership Style on Team Work, Patient Safety Performance, and Patient Safety Culture

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Abstract

This study was prepared to test and analyze the influence of patient safety culture factors, leadership style and teamwork on patient safety performance at Ulin Banjarmasin Hospital. A research concept framework that brings together four variables, namely leadership, teamwork, patient safety culture and safety performance. This study uses the positivist paradigm based on quantitative research. The results of the research obtained are leadership style that influences teamwork, leadership style influences patient safety performance, leadership style influences the patient safety culture.

Keywords: Leadership, Team Work, Safety Performance, Patient Safety Culture

Introduction

WHO in 2004 collected hospital research numbers in various countries, namely America, Britain, Denmark and Australia and found Unexpected Events with a range of 3.2% -16.6%. The data is a trigger in various countries to conduct research and development of patient safety systems.¹

In Indonesia, safety law has been made related to patient safety in 2009 which states that hospitals as health care agencies that deal directly with patients must prioritize safe, quality, anti-discriminatory and effective health services by prioritizing patient interests in accordance with standard home services.² Patient safety is a top priority in health services and is the first critical step to improve service quality and is related to the quality and image of hospitals.³

Improvements in patient safety outcomes, especially from organizations and individuals. In organizations there is a need for cultural change that focuses on the team and the Team Leader has the strong potential to bring patient safety management and better quality care. Teams must be tied to management in a way that enables their accountability to be recognized by everyone. A good team will be an open team learning from mistakes.⁴

Based on Minister of Health Regulation 1691 / MENKES / PER / VIII / 2011⁵ about Hospital Patient Safety that every hospital is required to carry out patient safety management. Ulin Banjarmasin Hospital is a hospital owned by the Provincial Government of South Kalimantan type A with complete classification according to the 2012 Hospital Accreditation Commission assessment Banjarmasin Ulin Hospital has a commitment to maintain and continue to improve service quality and patient safety so that it can provide excellent health services continuously and continuously for the community.

The culture of reporting an error is hampered because the formation of a blame culture is a frequent occurrence, so that solutions sometimes stop by pointing to someone’s mistakes. So that a system is needed where it can be seen how far the patient’s safety performance in the hospital can make continuous and continuous quality improvement efforts and to meet the needs and demands of the community and refer to the law on hospitals. This study aims to examine and analyze the influence of leadership styles on teamwork, patient safety performance, and patient safety culture.

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DOI Number: 10.5958/0976-5506.2019.02012.6
Method

This study uses the positivist paradigm based on quantitative research. More specifically, this study aims to analyze the effect of exogenous variables on endogenous variables. Exogenous variables include: leadership style, teamwork. Endogenous variable is patient safety performance. In addition to exogenous and endogenous variables, in this study there are also mediating variables, namely the culture of patient safety.

The population in this study were all employees working in all installations at Ulin Banjarmasin Hospital. The need for the number of samples will be calculated using the Slovin formula by determining the number of members of the population that can be researched (N) of 1215 with a degree of inaccuracy (d) of 5%. Then the number of samples needed is:

\[ n = \frac{N}{1 + Nd} \]

= 300.9 rounded to 301

In variable measurement techniques, when viewed from the nature of their influence, the research variables can be classified into endogenous variables and exogenous variables. In this study, to be able to measure and study the hypothesized variables, it will use the second order CPA measurement model, where the dimensions reflect the first level latent variables while the hypothesized variables are called the second level latent variables. The measurement scale that will be used in this study on all variables is the ordinal scale in this case the Likert scale.

The data to be collected and analyzed in this study come from primary data and secondary data. Primary data is collected from research instruments, namely questionnaires, which are the main instruments in this study. The secondary data will be collected from Ulin Banjarmasin Hospital internal data. The secondary data is the hospital profile and patient safety program at Ulin Banjarmasin Hospital.

In the research instrument test consisted of validity and reliability tests. Data analysis methods used are descriptive statistical methods and inferential statistical methods. The purpose of the descriptive statistical method is to describe the demographic characteristics of respondents such as gender, age, profession, position, length of work as an employee at Ulin Hospital Banjarmasin. While the inferential statistical analysis method that is data analysis used in inferential statistical methods in this study is partial least square (PLS).7

The Leadership Style variable (ξ1) is second order reflective:

First order:

\[ \xi_{11} = \lambda_{11} \xi_{1} + \delta_{1} \]
\[ \xi_{12} = \lambda_{12} \xi_{1} + \delta_{2} \]

Second order:

Transactional Leadership Style (ξ11)

\[ X_{11} = \lambda_{11} \xi_{11} + \delta_{11} \]
\[ X_{12} = \lambda_{12} \xi_{11} + \delta_{12} \]
\[ X_{13} = \lambda_{13} \xi_{11} + \delta_{13} \]

Transformational Leadership Style (ξ12)

\[ X_{21} = \lambda_{21} \xi_{12} + \delta_{21} \]
\[ X_{22} = \lambda_{22} \xi_{12} + \delta_{22} \]
\[ X_{23} = \lambda_{23} \xi_{12} + \delta_{23} \]
\[ X_{24} = \lambda_{24} \xi_{12} + \delta_{24} \]

The Team Work Variable (η1) is reflective

\[ Y_{11} = \lambda_{31} \eta_{1} + \varepsilon_{11} \]
\[ Y_{12} = \lambda_{32} \eta_{1} + \varepsilon_{12} \]
\[ Y_{13} = \lambda_{33} \eta_{1} + \varepsilon_{13} \]

The variable Patient Safety Culture (η2) is reflective

\[ Y_{21} = \lambda_{41} \eta_{2} + \varepsilon_{21} \]
\[ Y_{22} = \lambda_{42} \eta_{2} + \varepsilon_{22} \]
\[ Y_{23} = \lambda_{43} \eta_{2} + \varepsilon_{23} \]
\[ Y_{24} = \lambda_{44} \eta_{2} + \varepsilon_{24} \]
\[ Y_{25} = \lambda_{45} \eta_{2} + \varepsilon_{25} \]
\[ Y_{26} = \lambda_{46} \eta_{2} + \varepsilon_{26} \]
\[ Y_{27} = \lambda_{47} \eta_{2} + \varepsilon_{27} \]
\[ Y_{28} = \lambda_{48} \eta_{2} + \varepsilon_{28} \]
\[ Y_{29} = \lambda_{49} \eta_{2} + \varepsilon_{29} \]
\[ Y_{210} = \lambda_{410} \eta_{2} + \varepsilon_{210} \]
The patient safety performance variable ($\eta_3$) is reflective

\[ \begin{align*}
Y_{31} &= \lambda_{31} \eta_3 + \epsilon_{31} \\
Y_{32} &= \lambda_{32} \eta_3 + \epsilon_{32} \\
Y_{33} &= \lambda_{33} \eta_3 + \epsilon_{33} \\
Y_{34} &= \lambda_{34} \eta_3 + \epsilon_{34} \\
Y_{35} &= \lambda_{35} \eta_3 + \epsilon_{35}
\end{align*} \]

Partial Least Square (PLS) analysis is done through two stages, namely evaluating the outer model and inner model. Outer model is a measurement model to assess construct validity and reliability. The second stage in PLS analysis is the evaluation of the inner model to determine the coefficient $R^2$ for the dependent construct and the $t$-statistic value to test the construct of significance in the structural model.\textsuperscript{7,8}

**Results**

**Participants Characteristic**

**Table 1. Participants Characteristic**

<table>
<thead>
<tr>
<th>No</th>
<th>Characteristics</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>≤30 Years</td>
<td>4,7</td>
</tr>
<tr>
<td>2</td>
<td>31-40 Years</td>
<td>43,0</td>
</tr>
<tr>
<td>3</td>
<td>41-50 Years</td>
<td>26,7</td>
</tr>
<tr>
<td>4</td>
<td>≥50 Years</td>
<td>25,6</td>
</tr>
<tr>
<td>Sex:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Male</td>
<td>64,0</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>36,0</td>
</tr>
<tr>
<td>Tenure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1-5 Years</td>
<td>10,5</td>
</tr>
<tr>
<td>2</td>
<td>6-10 Years</td>
<td>20,9</td>
</tr>
<tr>
<td>3</td>
<td>11-15 Years</td>
<td>25,6</td>
</tr>
<tr>
<td>4</td>
<td>16-20 Years</td>
<td>23,3</td>
</tr>
<tr>
<td>5</td>
<td>More than 20 Years</td>
<td>19,8</td>
</tr>
</tbody>
</table>

The characteristics of the respondents in this study consisted of age, gender and work period. Respondent characteristics in this study had a age of 31-40 years which was equal to 43.0%, then age 41-50 years which amounted to 26.7%, 25.2% were over 50 years old, and the remaining 4.7% were <30 years old. Based on gender, it was seen that the majority of respondents in this study were men. The proportion of the male group is 64.0%, while in the female group is 36.0%. And based on the working period, it was explained that the majority of respondents had a working period of 11-15 years of 25.6%, working period of 16-20 years was 23.3%, working period of 6-10 years was 20.9%, working period of more than 20 year 19.8% and work period of up to 5 years is 10.5%.

The patient safety performance variables of each item have an average value ranging from 2.66 to 4.79 which can give an idea that patient safety performance is good enough. The highest mean value of 4.79 is in identifying patients before administration of drugs, blood, or blood products. While the lowest 2.66 is in carrying out the provision of information that is timely, accurate, and relevant in the hospital environment. This study uses six indicators to describe the variables of patient safety performance, including indicators (safe) (KK1), (effective) (KK2), (patient-centered) (KK3) (KK4), (efficient) (KK5), and (equitable) (KK6).

Based on the results of the descriptive study that based on the average score of respondents’ answers to the leadership style variable is included in the good category, thus it can be said that actually all indicators are included in the criteria of good. Therefore, all of these indicators should be maintained or reused. This study uses 6 indicators to describe variable patient safety performance, including contingent reward indicators (KK1), active management by exception (KK2), passive management by exception (KK3), inspirational motivation (KK4), intellectual simulation (KK5), and individualized consideration (KK6), idealized influence (KK7).

The variable value of team work for each item has an average value ranging from 3.51 to 4.24 which can give an idea that the value of team work is good. The highest average value of 4.24 is in the team members committed to achieving common goals / missions, while the lowest 3.51 is in me giving to other team members in decision making. This study uses three indicators to describe
the variable value of team work, includes indicators of commitment to shared goals (TW1), decision making (TW2), and conflict management (TW3).

The variable patient safety culture of each item has an average value ranging from 2.26 to 4.31 which can give an illustration that the patient safety culture is quite good. The highest average score of 4.31 is in our mutual support for one another, while the lowest of 2.26 is unpleasant if working with other parts of the hospital. This study uses twelve indicators to describe the variable of patient safety culture, including perception indicators (BK1), frequency of reporting (BK2), supervision (BK3), organizational learning (BK4), intra-sub-departmental collaboration (BK5), openness of communication (BK6), reciprocal errors (BK7), error sanctions (BK8), staff/employees (BK9), management support for patient safety (BK10), collaboration between sections (BK11), and transfer and replacement (BK12).

Partial Least Square (PLS) Model

The following are the results of reliability testing of teamwork, work safety culture, and patient safety performance.

### Table 2. Teamwork Construction Reliability

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Item</th>
<th>Cronbach Alpha</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment to Common Goals</td>
<td>5</td>
<td>0.869</td>
<td>0.906</td>
<td>0.660</td>
</tr>
<tr>
<td>Decision-making</td>
<td>2</td>
<td>0.669</td>
<td>0.855</td>
<td>0.748</td>
</tr>
<tr>
<td>Conflict Management</td>
<td>3</td>
<td>0.792</td>
<td>0.878</td>
<td>0.707</td>
</tr>
</tbody>
</table>

### Table 3. Reliability of the Work Safety Culture Structure after Evaluation

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Item</th>
<th>Cronbach Alpha</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception</td>
<td>4</td>
<td>0.727</td>
<td>0.833</td>
<td>0.561</td>
</tr>
<tr>
<td>Frequency of Reporting</td>
<td>3</td>
<td>0.663</td>
<td>0.817</td>
<td>0.602</td>
</tr>
<tr>
<td>Supervision</td>
<td>2</td>
<td>0.615</td>
<td>0.838</td>
<td>0.721</td>
</tr>
<tr>
<td>Organizational Learning</td>
<td>3</td>
<td>0.652</td>
<td>0.810</td>
<td>0.588</td>
</tr>
<tr>
<td>Intra-part / subdepartment cooperation *</td>
<td>2</td>
<td>0.664</td>
<td>0.856</td>
<td>0.748</td>
</tr>
<tr>
<td>Communication Openness</td>
<td>2</td>
<td>0.803</td>
<td>0.910</td>
<td>0.835</td>
</tr>
<tr>
<td>Reciprocal Mistakes</td>
<td>2</td>
<td>0.628</td>
<td>0.843</td>
<td>0.729</td>
</tr>
<tr>
<td>Sanction Error</td>
<td>2</td>
<td>0.661</td>
<td>0.855</td>
<td>0.747</td>
</tr>
<tr>
<td>Staff / Employees *</td>
<td>3</td>
<td>0.805</td>
<td>0.886</td>
<td>0.723</td>
</tr>
<tr>
<td>Management support for patient safety</td>
<td>3</td>
<td>0.638</td>
<td>0.793</td>
<td>0.566</td>
</tr>
<tr>
<td>Inter-Section Cooperation</td>
<td>2</td>
<td>0.669</td>
<td>0.855</td>
<td>0.748</td>
</tr>
<tr>
<td>Displacement and Substitution</td>
<td>2</td>
<td>0.666</td>
<td>0.855</td>
<td>0.747</td>
</tr>
</tbody>
</table>

### Table 4. Reliability of the Patient Safety Performance Construction After Item Evaluation

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Item</th>
<th>Cronbach Alpha</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe</td>
<td>6</td>
<td>0.798</td>
<td>0.856</td>
<td>0.500</td>
</tr>
<tr>
<td>Effective</td>
<td>3</td>
<td>0.842</td>
<td>0.904</td>
<td>0.759</td>
</tr>
<tr>
<td>Patient-Centered</td>
<td>5</td>
<td>0.772</td>
<td>0.848</td>
<td>0.531</td>
</tr>
<tr>
<td>Timely</td>
<td>2</td>
<td>0.615</td>
<td>0.837</td>
<td>0.720</td>
</tr>
<tr>
<td>Efficient</td>
<td>2</td>
<td>0.647</td>
<td>0.849</td>
<td>0.737</td>
</tr>
<tr>
<td>Equitable</td>
<td>2</td>
<td>0.944</td>
<td>0.974</td>
<td>0.947</td>
</tr>
</tbody>
</table>
Discriminant validity testing in research uses cross loading values and square root of average (AVE) with the aim of checking (testing) whether indicators are valid in explaining or reflecting latent variables.

The results show that the discriminant value of a variable’s validity is higher than the correlation value between variables. Thus it can be concluded that the outer model of this study has fulfilled discriminant validity. For example, the leadership style construct has an AVE value of 0.685, then the AVE root is 0.828. The large correlation coefficient construct leadership style with other constructs ranged from 0.473 to 0.574 so that this analysis concludes that there is a fairly discriminatory validity.

Reliability test results show that all constructs have a composite composite coefficient of more than 0.70. Thus, all measurement models used in this study already have high reliability. So that further analysis can be done by examining the goodness of fit model by evaluating the inner model.

Convergent validity measures the validity of an indicator as a measure of a construct, can be seen from the outer loading. Indicators are considered valid if the outer loading load 0.5 to 0.6 is considered sufficient, in the number of indicators per construct is not large, ranging from 3 to 7 indicators. In the PLS model, the loading factor for the reflexive indicator is outer loading, and for the formative indicator is the outer weight.

Model compatibility

Testing the structural model of Goodness of Fit on the inner model uses predictive-relevance (Q2) to measure how well the observation value is generated by the model. Q2 is based on the coefficient of determination of all dependent variables. The magnitude of Q2 has a range of values of $0 < Q2 < 1$, getting closer to 1 means the model is getting better. The suitability of the model can be assessed from several calculations such as the model coefficient of determination (Rm2) and the index of goodness of fit (GoF).

Hair et al. (2014) states that in general the coefficient of determination is low if it is worth 0.20 or less, while the results of this model are all worth more than 0.20. So based on these results the suitability of the model is quite good.9 The calculation results show the value of the inner model Rm2 is 0.800, which means that the research model has a high model match. The accuracy of the model is 80.0%, explaining that the contribution of the model to explain the structural relationship of the four variables studied is 80.0% and the rest is explained by other variables not involved in the model.

Structural Model Testing (Inner model)

The following are the results of measurements by testing the Inner model

Table 5. Path Coefficient Test Results in the Inner Model

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Path coefficient</th>
<th>Standard Error</th>
<th>Statistic t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables with variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership style -- Teamwork</td>
<td>0.496</td>
<td>0.058</td>
<td>8.632 *</td>
<td>0.000</td>
</tr>
<tr>
<td>Leadership style -- Safety culture</td>
<td>0.296</td>
<td>0.052</td>
<td>5.689 *</td>
<td>0.000</td>
</tr>
<tr>
<td>Leadership style -- Safety performance</td>
<td>0.188</td>
<td>0.066</td>
<td>2.861 *</td>
<td>0.002</td>
</tr>
</tbody>
</table>

The interpretation of the tables and images explains the relationships between variables as follows:

The leadership style of teamwork has a coefficient with a positive direction. The calculation results show that the path coefficient is 0.496 with a t-statistic of 8.632 ($p < 0.05$) giving a decision that the leadership style has a significant effect on teamwork.

The leadership style of the patient safety culture has a coefficient with a positive direction. The calculation results show that the path coefficient is 0.296 with a t-statistic of 5.689 ($p < 0.05$) giving a decision that the leadership style has a significant effect on the patient safety culture.

3. The leadership style of patient safety performance has a coefficient with a positive direction. The calculation results show that the path coefficient is 0.188 with a t-statistic of 2.861 ($p < 0.05$) giving a decision that the
leadership style has a significant effect on patient safety performance.

**Conclusion**

The leadership style has a significant direct effect on teamwork. The calculation results show that the path coefficient is 0.496 (p <0.05). The leadership style has a significant direct effect on patient safety performance. The calculation results show that the path coefficient is 0.188 (p <0.05). The leadership style has a significant direct effect on the patient safety culture. The calculation results show that the path coefficient is 0.296 (p <0.05).

**Ethical Clearance:** Not required

**Source of Funding:** Self funding.

**Conflict of Interest:** Nil

**References**

5. Regulation of the Minister of Health of the Republic of Indonesia No. 1691/Menkes/Per/VIII/2011 about Patient safety. Accessed from www.depkes.go.id
The Effect of Karin’s Model on Positive and Negative Thinking and the Development of Some Offensive Composite Basketball Skills for Female Students

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¹University of Baghdad/The college of Physical Education and Sport Sciences/Iraq

Abstract

The purpose of this study is to prepare and implement the modules in accordance with model Karin to develop some offensive skills basketball composite for students and identify the impact of gastric units with model Karin in positive and negative thinking and developing some offensive skills basketball composite for students either presumably there is research Statistically significant differences between the results of the tests of fingerprinting research experimental and control in the positive and negative thinking and developing some offensive skills basketball composite for female students and there is a statistically significant differences between the two sets of research officer and experimental results After tests in positive and negative thinking and developing some offensive skills basketball composite for students and researchers had used experimental method is experimental and one control totals tests on a sample of pre and post 45 freshman students phase in College Physical education and Sports Science/University of Baghdad and the positive and negative thinking was conducted on a sample of major experience as well as skill tests, then your approach has been applied to model Karen and then the researchers used statistical methods appropriate to extract the light results reached a number of conclusions from her stomach units with model Karin has a positive impact on the positive and negative thinking and experimental group than the control group in positive and negative thinking and superiority of the experimental group and control group was used to model Karen The approach used in the college in developing skills.

Keywords: Karin’s model, positive, negative thinking and composite skills.

Introduction

Education has an active role in the progress of nations and peoples and contribute to the achievement of hopes and aspirations, and this progress contributed to the creation of many methods and models of teaching, science has become doubly amazing and the student to be successful in reaching the goal required to receive a large amount of information is always renewable And know how to have the right information and useful at the same time to convert it to know “¹

In order to find more effective models that have an impact on the student, he must be able to acquire the information that helps them in confronting the new situations and to benefit from them in changing ideas and issuing judgments and generating new ideas in order to be able to achieve the objectives of the educational process. One of these models is the Karen model. This model is an integrated, multi-disciplined educational model based on cognitive theory. Its idea derives from the meaningful learning theory of Ozbel, which has made the learner the focus of the educational process, the exploitation of the previous knowledge, its activation and acquisition of new knowledge in an integrative, With the requirements of the educational situation in which the previous information is invested and the experience is recalled for the purpose of building knowledge “²

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Positive and negative thinking is one of the most important types of thinking. Positive thinking is very important in human life because it leads people to solve their problems, overcome difficulties, achieve their goals and feel satisfied. Basketball is one of the most competitive and competitive games in the world. It has a number of complex offensive skills such as handling, plucking, handling, correcting, handling, stopping, and other complex skills that are important skills. Their mastery is an effective element in achieving the best results in matches. Hence the importance of research in the preparation of units model Karen, which may have an impact on the thinking of positive and negative and the development of some of the offensive skills compound basketball.

**Research aims:**

1. Preparation and implementation of units on the model Karen to develop some of the offensive skills compound basketball students.
2. Identify the units prepared according to the Karen model in the positive and negative thinking and develop some of the offensive skills compound basketball students.

**Research methodology and field procedures**

**Research Methodology:**

The researchers used the experimental approach and the design of experimental and control groups with both pre and posttests to suit the nature of the research problem.

**Community Research and sample:**

The research community of the second stage students in the College of Physical Education and Mathematical Sciences for Girls of Baghdad University for the academic year (2018-2019) of (102) students in the grades were chosen by the deliberate method. The researchers chose the random sample in the lottery method, B) The experimental group is 24 students and the second is the control group. The total number of students is (21) students to be the total number (45) students. The sample of the pilot experiment was chosen from outside the sample of (5) from class (D).

Methods used in research:

1. Arab and foreign sources and references.
2. The questionnaire.
3. Experts and specialists.
4. For objective tests.

**Tools and devices used:**

1. Basketball field and accessories.
2. A computer type Dell (1).
3. Camera photography.
4. Measuring tape to measure distances.
5. Adhesive tape
6. Hour manual stopwatch.
7. Whistle.
8. Paintings showing the drawings.
9. Pictures showing how the technical performance of the skills selected in the research.

Field research procedures:

**Field research:**

**Determination of measurements and tests:**

**Positive and Negative Thinking Scale:**

After studying the many sources and scientific references, studies and research for the purpose of finding a measure through which to identify the amount of positive and negative thinking of the sample of the search, they found only a measure prepared by Saba Duraid super-age (2016). The researchers obtained the original source of the scale of positive thinking The questionnaire was presented by a questionnaire to the group of experts and specialists in the field of tests, measurement, kinetic learning, and psychology to determine the suitability of the scales for the second stage students at the Faculty of Education for girls and measured to reflect on the positive and negative when the university students.

Correction Method for Positive and Negative Thinking Scale (Key Sealing): The researcher identified each alternative position (A, B) and corrected the respondent’s answers on the scales of the scale (58) position in weights (1, 2) The method of the answer by selecting the appropriate alternative to the student on the situation and in this way will calculate the total score of each respondent through the total number of grades on Scale sections.
Skills Identification:

The researchers relied on the basic skills set in the vocabulary of the second stage (first course) in the Faculty of Physical Education and Sports Science for Girls (2018-2019) and the skills are:

Composite offensive skills:

First test:  

The purpose of the test: is to measure the ability to receive and the high-end conversation.

Account Grade:

- Calculates the time since the player received the ball lab until the end of the attempt after the ball left the hand of the laboratory player.
- Time division on (60 Sec.).
- The score for each player is determined by a successful jump.
- The score for the player (zero) of the score for each case of a peaceful correction or performance is incorrect.
- Collect degrees (accuracy) of successful attempts.

Total: division of the output of precision over time.

Second test:  

The purpose of the test: measuring the ability to receive the finished by jumping - two points

Account Grade:

Calculates the time since the player received the ball lab until the end of the tenth attempt after the ball left the hand of the laboratory player.

Time division on (60 Sec.).

The player will score one score for each successful jump.

The score for the player (zero) of the grades for each case of a failed jump correction.

Collect degrees (accuracy) of successful attempts.

Total: division of the output of precision over time.

Pre Tests:

The researchers conducted the pretests for the sample of the (45) students on Tuesday (9/10/2018) before starting the main experiment with the control of all variables.

Table (1). Shows the results of equivalence and the control and experimental research groups in the pre tests

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) value</th>
<th>significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
</tr>
<tr>
<td>Receiving and high-pitched finished pacification</td>
<td>24</td>
<td>1.36</td>
<td>0.458</td>
<td>21</td>
</tr>
<tr>
<td>Pickup by jumping</td>
<td>24</td>
<td>2.18</td>
<td>0.573</td>
<td>21</td>
</tr>
<tr>
<td>Positive and negative thinking</td>
<td>24</td>
<td>74.41</td>
<td>10.433</td>
<td>21</td>
</tr>
</tbody>
</table>
Implementation of the main study:

The researchers put the units of the Karen model of the experimental group and distributed to (8) units by one unit per week. The steps of the Karen model,

1. Review of previous information:
   A-At this stage, the information and skills that students learned in other lessons were reviewed.
   B-Preface: Started by the teacher in which the teacher provides applications with an introductory introduction includes the title and objectives of the lesson, and this stage aims to focus the attention of students in the subject of the lesson and then prepare for the integration of learning.

2. Overview: This procedure includes the development of a general organizational framework for the content of the lesson facilitates linking the content contained in the new information to be merged with the previous information of the learner and already exist in the construction of knowledge and the teacher can complete the stage of the overall view through the work of illustrations and maps concepts and the presentation of special videos. Skillfully, which in turn helps students to understand carefully the skill and help them to divide broad ideas into narrow and less comprehensive ideas.

3. The stage of strengthening the knowledge structure: This stage aims to install new information and establish it in the cognitive structure of the learner by making the student active in the research and survey and not be negative, but to do a number of internal and external activities

4. Registration: Students will record the results reached during the stage and these results are represented in the form of drawings and maps concepts, panels, lists, tables and reports.

5. Dialogue or discussion: As the students discuss the results recorded by students in the previous stages.

6. Knowledge supply: The teacher himself develops the ideas and conclusions reached by students in the previous stage (dialogue and discussion) and organizes and shows the relationship between them and then formulated and presented to students in the final

7. Application: Students practice alone or in cooperative groups skills that require dealing with them and employ their knowledge in new learning situations and requires when the implementation of this stage the passage of the learner in the stages of the previous model.

Posttests:

The researchers carried out posttests after completing the curriculum on (2-3 / 12/2018) on the two groups of control and experimental research of (45) students in the stadium and external theory hall in the Faculty of Physical Education and Sports Science.

Results and Discussions

Display the results of the pre and posttests of the experimental group in the investigated variables:

Table (2). Shows the mean, standard deviations and values calculated between the pre-test and the post-test of the experimental group in the variables investigated

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Receiving and high-pitched finished pacification</td>
<td>1.36</td>
<td>0.46</td>
<td>3.28</td>
<td>1.711</td>
</tr>
<tr>
<td>Pickup by jumping</td>
<td>2.18</td>
<td>0.57</td>
<td>4.82</td>
<td>1.374</td>
</tr>
<tr>
<td>Positive and negative thinking</td>
<td>74.41</td>
<td>10.43</td>
<td>105.91</td>
<td>7.131</td>
</tr>
</tbody>
</table>

The table value (1.741) was below the level of significance of 0.05 and the degree of freedom 23.
Table (2) shows the computational, standard deviations and calculated values of the differences between the arithmetic averages in the pre-test and the post-test. The results showed that the computed values of the receiving skill, the high discrete ending, the pacification and the positive, the positive and negative thinking were higher than the table values (1.714) below the level of significance of 0.05 and the degree of freedom 23, meaning that there are significant differences between the pre-test and the post-test of the variables investigated and for the post-test, meaning that Karen model positively affected the development of offensive skills and the effect of positive and negative thinking on the students in the research group. The researchers attribute this to the fact that teaching according to this Karen model makes the students the focus of the educational process and makes them positive, active, and active in their attention. Increase their effectiveness in participating in the lesson, stimulate their motivation, and help to organize ideas and develop better offensive composite skills.

Table (3). Shows the mean, standard deviations, and calculated values between the pre-test and the post-test of the control group in the investigated variables:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Receiving and high-pitched</td>
<td>1.48</td>
<td>0.753</td>
<td>2.11</td>
<td>0.985</td>
</tr>
<tr>
<td>finished pacification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pickup by jumping</td>
<td>2.17</td>
<td>0.614</td>
<td>3.25</td>
<td>0.874</td>
</tr>
<tr>
<td>Positive and negative thinking</td>
<td>75.76</td>
<td>9.076</td>
<td>90.28</td>
<td>7.590</td>
</tr>
</tbody>
</table>

The value of (t) Tabulated (1.725) under the (0.05) level and the degree of freedom 20.

Table (3) shows the computational and standard deviations and calculated values of the differences between the arithmetic averages in the pre-test and the post-test. The results showed that the calculated values of the receiving skill, the high-end, the finished and the positive, the positive and negative thinking were higher than the table values (1.725) below the level of significance of 0.05 and freedom degree 20, meaning that there are significant differences between the pre-test and the post-test of the variables investigated and for the post-test, and the researchers attributed these differences in the moral tests under the skill Research the vocabulary of the curriculum used by the teaching as the methodology used was planned and studied according to the correct scientific basis, which led to the achievement of the effectiveness of the performance of the students and among the reasons also the experience of the school material and its special way in the delivery of information through a comprehensive explanation and clear presentation and application.

View, analyze and discuss the results of the post tests of the control and experimental groups in the technical tests in question:

Table (4). Shows the mean and standard deviations and calculated values of the experimental and control groups in the post tests of the investigated variables:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) value</th>
<th>significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Receiving and high-pitched</td>
<td>3.28</td>
<td>1.711</td>
<td>3.85</td>
<td>0.985</td>
</tr>
<tr>
<td>finished pacification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pickup by jumping</td>
<td>4.82</td>
<td>1.374</td>
<td>3.25</td>
<td>0.874</td>
</tr>
<tr>
<td>Positive and negative thinking</td>
<td>105.91</td>
<td>7.131</td>
<td>90.28</td>
<td>7.590</td>
</tr>
</tbody>
</table>

The value of (t) Tabulated (1684) under the level of significance (0.05) and the degree of freedom (43).
Table (4) shows the arithmetic, standard deviations, and calculated values of the differences between the experimental and control groups in the post tests of the investigated variables. The results showed that the calculated values of the reception skill, 1.684) below the level of significance (0.05) and degree of freedom (43) This indicates the existence of significant differences between the experimental and control groups in all variables investigated and for the benefit of the experimental group and encourage the researchers to use a model that was He has an active role in demonstrating the abilities of female students through the use of complex offensive skills and increased their arousal and eagerness for skill. He emphasized Karen’s model of making students the center of the educational process and giving them the freedom to express their opinions without hesitation or fear. This reflected positively on their thinking and skills. The students’ involvement in the generation and discussion of ideas, which opened the way for their deep understanding, increased their skills and contributed to increasing the knowledge of female students in the cognitive structure.

Conclusions

1. Units prepared according to Karen model have a positive impact on positive thinking and negative.

2. Units designed according to Karen model effective approach to complex offensive skills.

3. The experimental group is superior to the control group in positive and negative thinking.

4. The experimental group that used the Karen model over the control group, which used the method used in the college in the development of skills under study.

Ethical Clearance- Taken from University of Baghdad committee

Source of Funding- Self

Conflict of Interest - None

References

1. Saad A. Z. and others, the comprehensive encyclopedia of strategies, methods, models, foundations and programs, Iraq, Baghdad, Mutanabi Street, Dar al-Mortada printing and publishing, 2013.


Isolation, Identification And Sequencing Of Mycoplasma Galisepticum By Culture And PCR In Baghdad City, Iraq

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¹College of Veterinary Medicine, University of Baghdad, Baghdad, Iraq

Abstract

This study is carried out to investigate the presence of Mycoplasma galisepticum in broiler and layer in farms infected with respiratory signs, a total of 200 samples were collected randomly from layer and broiler chickens with respiratory signs in Baghdad between January to May 2017. The results of culture revealed that the total rate of Mycoplasma species isolates (positive cultures) was 10%. The highest number of Mycoplasma species isolates was seen in trachea and lowest in conjuctivial swabs, oviduct and lung. There was no isolate from the choanal and nasal swabs, all positive cultures were staining with Diene’s stain. DNA was extracted from 20 positive culture isolates, all twenty isolates were positive for Mycoplasma genous by conventional PCR assay, and a product of 250 base pair was generated by amplification of 16S rRNA gene. Then twenty positive Mycoplasma spp isolates were subjected to MG and MS detection Kit, the result revealed 2/20 (10%) MG, 11/20 (55%) MS and 7/20 (35%) were positive for both MG and MS. The two MG isolates confirmation by subjected to amplification of the 16S RNA gene the results revealed that MG specific primers of the16S RNA gene the single band at 183bp the product of amplification of Mycoplasma galisepticum 16SrRNA gene was sent by MACROGEM (Korea) for sequencing. were submitted in Gene bank database and have accession number:ID: MG846120.1. Sequencing alignment showed that the 99% similarity of first isolate and second isolate of MG field isolates with standard reference Mycoplasma galisepticum strain ATCC, the phylogenetic analysis revealed that it was the Iraqi isolate was 100% similar to USA strain1NR104952, south Africa strain2MF196172, Iran strain7KC865737, VietNam H fatey strain 3AMO75207 and Egypt strain 6GO902040. Also which had 99% similar to Russia strain 8L36043.3, India strain 4KP685378.1 and Iran strain5AY705443.1.

Keywords: Isolation, identification and sequencing, Mycoplasma galisepticum.

Introduction

Mycoplasma disease is chiefly important in poultry as a cause of respiratory disease of chickens and turkey, it is related to the Class Mollicutes, Order Mycoplasmatales, family Mycoplasmataceae. Mycoplasma was characterized by small in their size, little genome, and loss of cell walls and bounded by a plasma membrane only. Avian mycoplasmosis was primarily described in turkeys in 1926, and in chickens in 1936. It is of world wide distributions and affects both the broiler grower and the layer birds. Mycoplasma gallisepticum, the most virulent and economically significant of the avian Mycoplasma, is the causative agent of chronic respiratory disease (CRD) in chickens and infectious sinusitis in turkeys. The disease can transmit both horizontally and vertically and remain in the flock constantly as subclinical form. Broilers and layer chicks in the age group of 4-8 weeks are affected mostly with suffering from respiratory sign. Isolation and identification of Mycoplasma galisepticum among poultry flocks improves prevention of pathogens spreading PCR method could be successfully used in the diagnosis of Mycoplasma infections besides the culture means. Genes 16S rRNA can use in many laboratories for diagnosis of Mycoplasma gallisepticum.

Mycoplasmas galisepticum in Iraq was first reported by were isolated by culture and serology tests. A
recent recorded by\textsuperscript{13,14} by using RTPCR and conventional pcr. The aim of this study is to detect the presence of \textit{Mycoplasma galisepticum} in the infected broiler and layer with respiratory sign in baghdad city of iraq using culture and molecular method.

**Materials and Method**

For obtaining \textit{Mycoplasma Galisepticum} different samples were collected during the period of 4 months. A total of 200 samples (organs and swabs) including Trachea, lung, air sac, oviduct, tracheal swab, conjunctivia swab, air sac swab and choanal cleft swab taken from layer and broiler poultry flocks in Baghdad were suffering from respiratory sign. were collected at necrobsy samples were transported to the laboratory labore in refrigerated container\textsuperscript{15}.

Small pieces of organ or swab were placed in 1–2 ml of PPLO broth with supplement growth and incubated aerobically at 37 C° for three days and then streaked on PPLO agar in an inverted position in candle jar or in anaerobic jar at 37 C° increased humidity and CO2 tension, these condition for 6 days all plates were examined for Mycoplasma growth at 3 days intervals under dissecting microscope\textsuperscript{16}. DNA extraction was performed on positive Mycoplasma colony suspected, that grow on pplo agar and stained with diense stain were sub culture overnight in pplo broth and used for DNA extraction according to\textsuperscript{19}. DNA was extracted according to manufacture of DNEasy blood and tissue extraction kit (QIAGEN, USA). Convetional PCR assay was used in this study for detection of Mycoplasma genus and spp so for detection of Mycoplasma genus was used primers based 16S ribosomal RNA gene were designed by\textsuperscript{20}, then the positive samples to Mycoplasma genus subjected to PCR for detection of \textit{Mycoplasma galisepticum} in this step were used \textit{Mycoplasma gallisepticum & Mycoplasma Synoviae} Detection Kit is direct detection of Avian mycoplasmosis (\textit{M. synoviae} and \textit{M. gallisepticum}) on the basis of a genetic data base. Interpretation Expected \textit{Mycoplasma synoviae} PCR product size: 557bp Expected Mycoplasma gallisepticum PCR product size: 224bp this Kit was performed according to the manufacturer instruction) also used the 16SrRNA gene for \textit{Mycoplasma galisepticum} confirmation, The primer sequence for the amplification gene 16SrRNA for \textit{Mycoplasma galisepticum} were designed by (15). The products of amplification MG strain obtained from conventional PCR was sent by Macrogen company to Korea. (NICEM) company for sequencing (sanger method), Nucleotides sets were used to obtain the identity score of our isolate strain with the other world references strains (six) by the Mega6+NCBI program according to\textsuperscript{21}.

**Results**

The results showed that a total of 200 samples were collected randomly from layer and broiler chickens with respiratory signs (60) from trachea, (30) Lung, (40) Air sac, (20) oviduct, (25) tracheal swab, (10) conjuctivial swab, (10) choanal swab, and (5) nasal swab. Percentage of positive samples revealed by primary culture was 10%. The highest number of Mycoplasma species isolates was seen in trachea (6) followed by Air sac (5), tracheal swabs (3), and lowest in conjunctival swabs (2), oviduct (2) and lung (2). There was no isolate from the choanal and nasal swabs as show in table (1). Positive samples revealed growth many forms of mycoplasma colonies on PPLO agar such as typical fried egg colonies with or without regular edge and colony with less center figure 1(a, b, c, d).

**Table 1: Result of mycoplasma isolation from specimens by culture**

<table>
<thead>
<tr>
<th>Samples(Organs and swabs)</th>
<th>No.of examined samples</th>
<th>No.of positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracheal</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Lung</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>Air sac</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>Oviduct</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Tracheal swabs</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>Choanal swabs</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Conjunctivial swabs</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Nasal swabs</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Total count / percentage of isolate</td>
<td>200</td>
<td>(20)/(10%)</td>
</tr>
</tbody>
</table>
Twenty positive culture isolate were tested by conventional PCR with primers a 250 bp region of 16S rRNA gene was amplified for the Mycoplasma genus the result show all isolates were scored to be positive Mycoplasma genus fig. (2) The results of MG and MS PCR detection Kit which were observed 2(10%) positive to MG,11(55%) positive to MS and 7( 35%) positive to MG and MS from 20 positive mycoplasma isolates as in table (2) the two positive MG isolater were amplified and shown single band at 210 bp while the 11positive Ms isolater were amplified and shown single bands at 510 bp fig.4(a,b,c) The results of the 16S RNA gene revealed that MG primers of the 16S RNA gene had successfully targeted the respective gene and shown the single bands of the 16S RNA gene of *M. galisepticum* at 183bp in the two isolate of MG as showed in figure.(5) Sequencing alignment showed that the 99% similarity of first isolate ,score932 and expect 0.0 with standard reference Mycoplasma galisepticum strain ATCC Sequencing alignment showed that the 99% similarity of second isolate ,score882 and expect 0.0 with same standard reference ,result of phylogenetic tree of 16Sribosomal RNA gene we found that Iraqi isolate was 100% similar similar to USA strain1NR104952,south Africa strain2MF196172 , Iran strain7KCC865737 ,VietNamHatey strain 3AMO75207 and Egypt strain 6GO902040 . Also which had 99% similar to Russia strain 8L36043.3,India strain 4KP685378.1 and Iran strain5AY705443.1 .

**Table 2: Results of MG and MS PCR detection Kit**

<table>
<thead>
<tr>
<th>Total positive percentage of Mycoplasma genous</th>
<th>No. of positive per results for <em>Mycoplasma galisepticum</em></th>
<th>No. of positive per results for <em>Mycoplasma synoviae</em></th>
<th>No. of positive per results for Mix isolates of Mg and Ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2/20(10%)</td>
<td>11/20(55%)</td>
<td>7/20(35)</td>
</tr>
</tbody>
</table>

---

**Fig. 2:** Agarose gel electrophoresis image that show the PCR product analysis of 16S rRNA gene in Mycoplasma genus positive isolates. Where M: marker (1000-100bp), lane (1-20) positive Mycoplasma genus at (250bp) PCR product.

**Fig. 3:** (a,b,c) Electrophoresis of PCR product by *Mycoplasma galisepticum* and *Mycoplasma synoviae* detection kit. Where M: marker (1000-100bp), lane (c) control of MS and MG at (210 and 510)bp PCR product, lanes (1,3,4,8,19,14,15,16,17,18,19) positive *Mycoplasma Synovia* at (510)bp PCR product, lanes (12 and 13) positive *Mycoplasma galisepticum* at (210)bp PCR product and lanes (2,5,6,7,10,11 and 20) positive to *Mycoplasma galisepticum* and *Mycoplasma Synovia*.

**Fig. 4:** (a) Electrophoresis of amplicon PCR products of field isolate of MG had a single band at size 183bp represent 16sRNA gene M: marker (1000bp),
Table 3: show sequencing

<table>
<thead>
<tr>
<th>No. Of sample</th>
<th>Type of substitution</th>
<th>Location</th>
<th>Nucleotide</th>
<th>Range of nucleotide</th>
<th>Sequence ID</th>
<th>Score</th>
<th>Expect</th>
<th>Identities</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>First isolate</td>
<td>Transversion</td>
<td>257</td>
<td>G&gt;T</td>
<td>36 to 979</td>
<td>ID: NR_104952.1</td>
<td>932</td>
<td>0.0</td>
<td>99%</td>
<td>Mycoplasma gallisepticum</td>
</tr>
<tr>
<td></td>
<td>Transition</td>
<td>334</td>
<td>C&gt;T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transition</td>
<td>544</td>
<td>T&gt;C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transversion</td>
<td>569</td>
<td>G&gt;C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second isolate</td>
<td>Transition</td>
<td>1111</td>
<td>C&gt;T</td>
<td>502 to 1395</td>
<td>ID: NR_104952.1</td>
<td>882</td>
<td>0.0</td>
<td>99%</td>
<td>Mycoplasma gallisepticum</td>
</tr>
<tr>
<td></td>
<td>Transition</td>
<td>1151</td>
<td>G&gt;T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transversion</td>
<td>569</td>
<td>C&gt;G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transition</td>
<td>544</td>
<td>A&gt;G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig. 5: Show phylogenic tree of one isolate using Mega6+NCBI

**Discussion**

In the present study, isolation of MG was used PPLO broth and agar medium with supplements which was found suitable for culture of Mycoplasma and this result agreement to the finding of\textsuperscript{11,12}. The suspected colonies were showed fried egg shaped on solid media\textsuperscript{22,23}. Also appear another form of colony with less center on solid media under stereomicroscope\textsuperscript{15}. In present study, the overall prevalence of Mycoplasma was 10% (20/200), this percentage lower than previous studies\textsuperscript{11,14} were isolated Mycoplasma at different localities from Baghdad with an incidence of (15.38)% and 14.43%) respectively also lower than other prevalence of Mycoplasma in other countries (Singapore, Pakistan and Egypt)by\textsuperscript{23,24,25}, with prevalence percentage of (49%, 14.4% and 27.6%) respectively, the reasons for low isolation rate in the present study, may be may be present antimycoplasmal substances, antiserum and different types of inhibitors decreased chances of isolation\textsuperscript{26}. The highest number of Mycoplasma isolate were from trachea 6/60 this result were substantiated by the finding of(23and27) might be attributed to a factor that trachea is the first organ of respiratory tract which is exposed to the infectious agent\textsuperscript{8}. In this study, similar result were obtained by\textsuperscript{28} were isolated Mycoplasma from chicken’s respiratory and reproductive samples this related to the air sacs and surface of the ovaries in close proximity to the abdominal air sacs or that MG organism can spread from via blood stream to the ovaries that indicated the tissue proclivity of MG\textsuperscript{29}. all the positive cultures isolate
were showed to be positive for genus Mycoplasma by subjected to PCR amplification created product of approximate molecular size 250 bp fragments of 16SrRNA gene (100%) . These results were in same line of the results obtained by 30,31 who were reported that 16SrRNA gene was able to identify all the examined avian Mycoplasma and routine PCR test in conjunction with conventional identification methods could be effective in providing a more accurate profile of the prevalence of Mycoplasma in poultry flocks. In present study was used kit of MG and MS detection (Conventional PCR ),the percentage of MG as pure culture was low may be due to fastidious nature of MG and a competition of other nonpathogenic mycoplasma to Mycoplasma gallisepticum32. The percentage of MG isolated in this study was lower than another studies were used conventional PCR23,25,33 who isolated M. gallisepticum with prevalence 73%,17.8 %,and21% respectively ,this differences in rate of isolation may be due to difference in sampling strategy, surveilance programme, and season of sample collection.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the Faculty Scientific Committee (College of Veterinary Medicine, University of Baghdad, Iraq) to solate, identificate and sequencing of Mycoplasma galisepticum by culture and PCR in Baghdad city, Iraq.

References


Association between Platelet - Lymphocyte Ratio and Behçet’s Disease Activity: A Single Center Study

Faiq I. Gorial1, Zahraa Mustafa Kamel 2

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2Rheumatology Unit, Baghdad Teaching Hospital, Baghdad, Iraq

Abstract

Objective. To evaluate the association between platelet-lymphocyte ratio (PLR) and disease activity of Behçet’s disease (BD). Patients and Method. A total of 66 Iraqi patients who were diagnosed with BD and 66 apparently healthy individuals matched in age and sex as controls were enrolled in the study. Demographic and Clinical data of the patients were assessed. Disease activity was measured using BD current activity form. PLR was calculated. Results. No significant difference between patients and controls in age and sex (p>0.05). Mean PLR was relatively higher but non significant in BD patients compared to controls (119.4 ± 58.7 vs 113.6 ± 20.6; P=0.45). No correlation between PLR and disease activity in BD (p>0.05)

Conclusion. PLR was relatively higher in BD patients compared to controls but statistically not significant. No significant correlation between PLR and disease activity in BD.

Keywords: Platelet-lymphocyte ratio, Behçet’s disease, Platelet, lymphocyte, White blood cells, inflammatory mediators.

Introduction

Behçet’s disease is a chronic, relapsing, and debilitating systemic vasculitis of unknown aetiology (1). The principal pathological process of the inflammatory vasculopathy is an obliterative and necrotizing vasculitis that affects both the arteries and the veins of all sizes in almost all organ systems(2), a process that occurs concurrently or consecutively. Mucocutaneous lesions are the hallmarks of the disease (3). It affects people mainly between the ages of 20 to 40 (4), and shows a male preponderance in Middle Eastern countries and the Mediterranean; however, women are more commonly affected in Japan and Korea (5) The estimated prevalence of 1.7 BD patients for 10,000 Iraqi population is more or less similar to the prevalence in other Mediterranean and Far East countries, excluding Turkey. The presence of recurrent mouth ulcers is a high predictor for developing BD among Iraqis compared to European individuals (6) Platelet Lymphocyte Ratio (PLR)) in peripheral blood is easy systemic inflammatory marker and calculated as the number of platelets divided by the lymphocyte count from the blood samples (7) It has recently emerged as a potential inflammatory marker,predictor and a prognostic biomarker (8) of diverse diseases such as cancer, cardiac, metabolic syndrome and inflammatory diseases (9) High PLR values indicate increased inflammation, and may be useful to estimate the disease activity in BD. Only in one study showed an association between PLR and disease activity in patients with BD, despite a few studies have investigated PLR in patients with BD (10-13). This study aimed to assess the relation between PLR in patients with BD activity among sample of Iraqi patients.

Patients and Methods

Study design. This case-control study was conducted at the Rheumatology Unit of Baghdad Teaching Hospital in Medical City from July 2017 to the end of February 2018.

Participants: Inclusion criteria included patients with Behçet’s disease diagnosed according to International Study Group criteria for Behçet’s disease

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and compared with apparently healthy controls matched in age and sex. Patients were excluded from the study if they had other autoimmune diseases such as Systemic Lupus Erythematosus, Inflammatory Bowel Disease and psoriasis, skin diseases or allergy, inflammatory or infectious diseases, chronic diseases such as cardiovascular, hematological, liver, kidney, malignant diseases, diabetes mellitus and hypertension, received blood transfusion during the past 4 months, pregnancy or postpartum 6 months for female were also excluded from the analysis.

Data collection and entry: Data entry were done using paper clinical research form through interview and questionnaires. Patients age, gender, smoking status, body mass index (BMI) according the equation BMI=weight / height $^2$, BD duration All controls were asked for age, sex, smoking status, height and weight for BMI.

Methods and data monitoring: Blood samples were collected in both groups for measuring hemoglobin (Hb), red cell distribution width (RDW), mean platelet volume (MPV), white blood cells count (WBC count), neutrophils count, lymphocytes count, monocytes count, platelets count beside ESR and CRP were recorded. Blood PLR for each participant was calculated manually by dividing the platelets count on lymphocytes count after obtaining the results from laboratory. Disease activity was measured by using the Behçet’s Disease Current Activity Form (BDCAF).

Collection of blood samples: Blood samples were collected from each participant under aseptic venipuncture and 5 ml of venous blood were collected from each patient and control to calculate CBC, ESR,CRP.

Statistical analysis: continuous variables were presented as mean ± SD if normally distributed and median (interquartile range) if not normally distributed. Categorical variables were presented as numbers and percentiles. Students t test was used to compare between normally distributed continuous variables and Chi square test for categorical variables. P value <0.05 was considered statistically significant. Statistical software SPSS v24 was used for analysis.

Results

A total of 66 Behçet’s disease (BD) patients and 66 controls were enrolled in this study, the mean age of BD patients was $35.7 \pm 10.2$ years and $35.2 \pm 10.4$ for controls. Males were dominant in both studied groups; 63.6% among BD patients and 60.6% among controls. The mean body mass index (BMI) was almost equal in BD and controls groups, $27.9 \pm 5.2$ and $27.1 \pm 4.3$ kg/m$^2$, respectively. Smokers represented 36.4% and 33.3% among BDs and controls, respectively. No statistically significant differences had been found between both groups regarding their demographic characteristics, as shown in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>BD (n = 66)</th>
<th>Controls (n = 66)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, Mean (SD)</td>
<td>35.7 (10.2)</td>
<td>35.2 (10.4)</td>
<td>0.77</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>0.7</td>
</tr>
<tr>
<td>Male n (%)</td>
<td>42 (63.6%)</td>
<td>40 (60.6%)</td>
<td></td>
</tr>
<tr>
<td>Female n (%)</td>
<td>24 (36.4%)</td>
<td>26 (39.4%)</td>
<td></td>
</tr>
<tr>
<td>BMI Mean ± SD (kg/m$^2$)</td>
<td>27.9 (5.2)</td>
<td>27.1 (4.3)</td>
<td>0.32</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td>0.71</td>
</tr>
<tr>
<td>Smoker n (%)</td>
<td>24 (36.4%)</td>
<td>22 (33.3%)</td>
<td></td>
</tr>
<tr>
<td>Non-smoker n (%)</td>
<td>42 (63.6%)</td>
<td>44 (66.7%)</td>
<td></td>
</tr>
</tbody>
</table>

P<0.05 significant; BD, Behçet’s Disease, n, number, SD, Standard Deviation; BMI, Body Mass Index

Table 2 shows that the median disease duration since diagnosis was 3 years (IQR: 0.78 – 5.0) median disease duration since onset of symptoms was 5.7 years (IQR: 2.6 – 10.3) and the median disease activity index was 3.0 (IQR: 1.0 – 5.0). Additionally, the same table shows the distribution of treatment received by BD patients during their disease duration; almost 60% of the patients used biologics, 50% used corticosteroids, 45.5% Colchicine, 37.9% Immunosuppressants and only 3% used Anticoagulants, it is worth mention that there was an overlapping in the treatment used where some patients used combinations of these treatment.
Table 2. Behçet’s disease related variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease duration since diagnosis (year), Median (IQR)</td>
<td>3.0 (0.78 – 5.0)</td>
</tr>
<tr>
<td>Disease duration since onset of symptoms (year), Median (IQR)</td>
<td>5.7 (2.6 – 10.3)</td>
</tr>
<tr>
<td>BD activity index, Median (IQR)</td>
<td>3.0 (1.0 – 5.0)</td>
</tr>
<tr>
<td>Treatment n(%)</td>
<td>Biologics (Infliximab and Adalimumab)</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>33 (50.0%)</td>
</tr>
<tr>
<td>Colchicine</td>
<td>30 (45.5%)</td>
</tr>
<tr>
<td>Immunosuppressants</td>
<td>25 (37.9%)</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>2 (3.0%)</td>
</tr>
</tbody>
</table>

IQR, Inter Quartile Range; BD, Behçet’s Disease

The mean PLR was relatively higher in BD patients compared to controls; 119.4 ± 58.7 and 113.6 ± 20.6, respectively, however, the difference was statistically insignificant, (P>0.05), as shown in figure 1.

![Figure 1: Comparison of platelet lymphocyte ratio between Behçet's disease (BD) and controls.](image)

To assess the effect of baseline characteristics on PLR in BD patients, this analysis revealed that male gender was significantly associated with higher PLR, (Beta = 0.416, P. value = 0.01), and this was the only significant correlation, while no statistically significant correlation had been found with any of the other variables; age, BMI, smoking, disease duration disease activity or treatment, (P>0.05), as shown in the linear logistic regression analysis in Table 3.

Table 3. Linear regression analysis to find the Effect of baseline characteristics on PLR in BD

<table>
<thead>
<tr>
<th>Variable</th>
<th>Partial Regression coefficient standardized (Beta)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.047</td>
<td>0.74</td>
</tr>
<tr>
<td>Gender(Male)</td>
<td>0.416</td>
<td>0.01</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.098</td>
<td>0.46</td>
</tr>
<tr>
<td>Smoking(smoker)</td>
<td>0.101</td>
<td>0.47</td>
</tr>
<tr>
<td>Disease duration since diagnosis(years)</td>
<td>-0.03</td>
<td>0.92</td>
</tr>
<tr>
<td>Disease duration since onset of symptoms(years)</td>
<td>-0.112</td>
<td>0.67</td>
</tr>
<tr>
<td>Disease activity</td>
<td>-0.136</td>
<td>0.31</td>
</tr>
<tr>
<td>Treatment</td>
<td>-0.07</td>
<td>0.60</td>
</tr>
</tbody>
</table>

BMI, Body Mass Index

Discussion

This study measured the level of blood PLR in BD patients in comparison with control group and evaluated different parameters to avoid the cofactors that may influence the results. It showed that there was statistically insignificant difference between patients and controls in PLR and the mean PLR was relatively higher in patients with BD compared to controls, however the difference was statistically not significant. We also study the correlation of ESR and CRP with activity of BD, and found there is no statistically significant correlation, after adjustment of the other demographic data, and this result was in agreement with El Menyawi M. et al study (16) which found that inclusion of (ESR) and (CRP) measurements would not add significantly measurement of disease activity, that where disease appeared to be clinically inactive with presence of raised ESR or CRP. Alan et al (17) found that PLR was significantly higher in patients with BD than in healthy controls. However, no association between the severity score of BD and PLR.
Jiang Y et al (13) demonstrated that severity score of BD correlated positively with PLR. In light of our findings, we assessed the disease activity by BD current activity forum (BDCAF) [15] and the median disease activity index was 3.0 (IQR: 1.0 – 5.0). This analysis revealed that male gender was significantly associated with higher PLR and this was the only significant correlation and this perhaps the males were dominant in both studied groups. An explanation for this discrepancy was the possibility that PLR alone was not an appropriate indicator of platelet activation in accordance with a conclusion stated by Beyan et al (18) that platelet indices should not be used alone as direct indicators of platelet activation, as they found no correlation between platelet aggregation responses and platelet indices. Additionally, 60% of the patients used biologics, 50% used corticosteroids, 45.5% Colchicine, 37.9% Immunosuppressants and only 3% used Anticoagulants. So medication used by the patient may alter PLR and/or LMR ratio. The difference of the current study from the previous two studies may be related to many limitations as the differences in the study design, small sample size, short duration, patients from a single tertiary center and were usually on treatment beside the geographical factors that by dehydration or overhydration can influence the result of the ratios which are difficult to control. However, this is the first study in Iraq that evaluated PLR as a parameter to assess disease activity of BD. This is a simple, rapid inexpensive, can be easily calculated as common component of the complete blood count (CBC) test that is nowadays widely distributed in nearly every health care facility and by an automated machine.

In conclusion, No statistical significant differences in PLR between patients and controls. No statistical significant correlation between BD activity with PLR. No statistically significant correlation had been found between BD activity with ESR and CRP. Male patients were significantly associated with higher PLR. These findings need larger sample size and longer duration study including other markers to further validate the findings of this study. PLR may not be dependent as a marker of activity of BD.

**Conflict of Interest:** The authors declare that there is no conflict of interests between them.

**Source of Funding:** The source of funding was by authors.

**Ethical Clearance:** Ethical approval was obtained from the Ethics Committee of University of Baghdad, College of Medicine, Medical Department and Informed consent was obtained from each participant included in this study.

**References**


Clinical, Urodynamic and Ultrasound Study for the Evaluation of Urinary Incontinence Associated with Genital Prolapse

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Abstract


Setting: Gynaecologic outpatient Clinic, Al-Elwiya Maternity Teaching Hospital, Baghdad –Iraq. Patients and methods: The study was conducted on 69 women with urinary incontinence associated with genital prolapse. Detailed history and clinical examination including complete bimanual pelvic examination, stress test, Bonney test and Q-tip test, then ultrasound and urodynamics study were performed for them Results: nocturia and urgency were significantly more common in those with DI or mixed incontinence than those with GSI. Both Q-tip test and ultrasound were used to assess BNM and so can detect stress incontinence with sensitivity (81.8% versus 36.4%), specificity (50% versus 50%), positive predictive value (81.8% versus 66.7%), negative predictive value (50% versus 22.2%), and accuracy (73.3% versus 40%). From 30 women who underwent urodynamics study, 60% had GSI and 40% had detrusor instability or mixed incontinence. Conclusions: Q-tip test is a useful clinical test and more accurate than ultrasound in detecting bladder neck mobility. Urodynamics study is expensive and time consuming so limit its use to those with urinary incontinence, urgency and nocturia as they are more likely to have detrusor instability or mixed incontinence.

Key-words: Urinary incontinence, Genital prolapse, Ultrasound.

Introduction

UI is defined by the International Continence Society as the involuntary loss of urine which is objectively demonstrable and a social or hygienic problem. The prevalence of UI increases with age, parity, and obesity [1].

Types of Urinary Incontinence: Genuine stress incontinence (GSI): is defined as the involuntary loss of urine when the intraabdominal (and therefore intravesical) pressure exceeds the maximum urethral closure pressure in the absence of detrusor activity. [2]. This can result from hypermobility of the bladder neck (HBN) 75% or intrinsic sphincter deficiency (IDS) 25%. GSI is the commonest cause of UI in women. [3]

Detrusor Instability (urge incontinence) (DI): is defined as the presence of spontaneous or provoked detrusor contractions during the filling phase when the patient is attempting to inhibit micturition, that cause a sudden urge to urinate. It is the second commonest cause of UI in women [4]. Other types include Mixed, Retention with overflow incontinence, Congenital [4,5], Functional incontinence, Miscellaneous [6] and Fistulas [7].

Clinical Evaluation and Diagnosis of UI: The basic evaluation includes history, physical examination, local neurologic, gynaecologic examination, cough stress test, Bonney test, Q-tip test, urinalysis, 24 hr voiding diary, pad test, and estimation of post void residual urine [7]. Advanced evaluation: includes urodynamics, imaging, endoscopy and electromyography.

Patients and Method

This study includes 69 patients with urinary incontinence associated with female genital prolapse, who were selected from patients attending Al-Elwiya
Maternity Teaching Hospital. Those with neurologic diseases, pelvic cancer, pregnant patients or within 6 weeks postpartum and those with previous surgical treatment for UI, prolapse or hysterectomy were excluded. Detailed history and physical examination were performed looking for the risk factors and symptoms suggestive of urinary incontinence and genital prolapse which include (feeling of lump, backache, local discomfort, vaginal discharge, dyspareunia, frequency, urgency, nocturia, dysuria, leak of urine and wearing of pads for protection). Neurological status was evaluated including mobility and gait to rule out sensory or motor dysfunction that may affect the bladder, urethra and the pelvic muscles.

Informed consent was taken from the patient before starting the physical examination. The type of uterovaginal prolapse is assessed by examining the patient in dorsal position with a relatively full bladder on a gynecological couch using Sim’s speculum to retract the posterior then the anterior vaginal wall and ask the patient to strain. Complete bimanual pelvic examination was performed to exclude abdomino-pelvic masses, to assess irritation related to urinary leakage or from protection pads, and the vagina was observed for estrogen effect.

**Clinical assessment of UI:**

For all women urine was sent for microscopic examination, culture and sensitivity and UTI was treated if present. The patient was asked to cough vigorously while in the same position, if urine leakage was observed, an uplift of the urethrovesical junction was applied [2], when it control the leak, it was considered as positive Bonney test, while if no urine leaked in dorsal position, the test is repeated in standing position. Complete bimanual pelvic examination was performed to exclude abdomino-pelvic masses, to assess irritation related to urinary leakage or from protection pads, and the vagina was observed for estrogen effect.

**Ultrasound scan:** Used to assess bladder neck mobility (BNM) and post voiding urine volume in women who have clinical evidence of UI, as follows:

* **Bladder neck mobility:** The women lie in supine position with average 300 ml urine filling the bladder was examined using the perineal approach; the probe was put on a sagittal plane to identify bladder, urethra, bladder neck, the long axis of symphysis pubis and its lower border in the same image. The reference line was a straight line drawn perpendicular to symphysis axis. The distance between the bladder neck and this line is measured at rest and during straining. At rest the bladder neck is normally above or at the level of the reference line, ≥ 1 cm of bladder neck descent on maximum straining is considered a cutoff value that indicates hypermobility of bladder neck. If the bladder displaces but remains above the pubic symphysis, the amplitude of the displacement is the subtraction of these measurements, but if it displaces below the pubic symphysis, the result will be the addition of these measurements [3].

* **Postvoiding residual urine volume:** The patient was asked to empty her bladder; the residual urine volume was obtained by transabdominal ultrasound. The ultrasound bladder volume calculation using the three dimensions available as software embedded in the ultrasound scanner, taking > 50 ml as significant residual urine volume [6,8].

**Urodynamic evaluation:** Was advised for the sixty nine patients with UI as assessed clinically, only 30 did the test, after obtaining their informed consent. The woman was asked to empty her bladder and then examined in the supine position. A complete urodynamic evaluation was performed (subtraction cystometry and uroflowmetry).

* **Cystometry:** Double lumen urethral catheter 6 F was introduced using aseptic technique. Rectal catheter was also introduced and on each catheter a transducer is mounted. Sterile normal saline was infused at rate of 60 ml/min, zero reference for all pressure measurements is the level of the superior margin of the symphysis pubis.

The following measurements were done: Vesical pressure, abdominal pressure which is reflected through the rectal catheter, detrusor pressure calculated from the subtraction of abdominal pressure from the vesical pressure (significant detrusor pressure > 15 cm H₂O) [4,6,7].
Bladder capacity at 1st desire (N. 50-150 ml)

Bladder capacity at normal desire (N. 200-400 ml)

Bladder capacity at strong voiding desire (N. 400-600 ml) (1)

In addition to maximum bladder capacity (ml), compliance calculated from the formula = the change of bladder volume to the change in detrusor pressure. At 300 ml of saline infusion, these patients were asked to cough, when urine leaked, pressures were recorded.

* Uroflowmetry: Catheters were removed, the woman void in the sitting position, the following were measured. Flow time, voiding time, time to maximum flow, voided volume were measured then maximum flow rate (normally > 15 ml/s) (9) and average flow rate were calculated.

Statistical analysis: Results were presented as frequencies, mean and standard error of the mean (M ± SE) was calculated. Student t-test and Chi-square test were used as tests of significance taking p value ≤ 0.05 as a significant value. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy were calculated using 2 x 2 table.

Results

A total of sixty-nine women with UI associated with genital prolapse were included in this study. The mean age ± SE (year) was 41±0.79 (range 25-58) and BMI ± SE (kg/m²) was 32.6 ± 0.58 (range 23-51). It was found that 67.62% of the patients had cystocele, 64.17% had rectocele, 18.63% had uterine prolapse and 28.98% had enterocele. The mean PVR as assessed by ultrasound for the 69 women was 15.1 ml. The severity of UI was assessed by frequency of urine leak per week, the need to wear protection pads and when the leak is evident in the supine position. In our study, 34 out of 69 women (49%) had severe type of incontinence. From 69 women who were advised for urodynamics study, only 30 women underwent the test, 18 (60%) were found to have GSI, while the others (40%) had DI or mixed incontinence as shown in table 3.1. GSI was diagnosed when there was stress incontinence evident from symptoms and signs and/or leak during urodynamic study; provided that all the parameters of the subtracted cystometry and the uroflowmetry were normal. Also table 3.1 showed a significant relation between urgency and nocturia and type of UI as they are more in those with DI or mixed incontinence. Both Q-tip clinical test and ultrasound were used to assess BNM, it was found in table 3.2, that BNM as assessed by Q-tip test was present in 83% of those with GSI, and in 58% of those with DI or mixed incontinence, while BNM as assessed by ultrasound was present in 28% of those with GSI, and in 58% of those with DI or mixed incontinence. Q-tip test had a statistical significance in assessing BNM in those with GSI, more than ultrasound (p value 0.0025).

It was found from table 3.3 that sensitivity, specificity, PPV, NPV and efficiency of Q-tip were 81.8%, 50%, 81.8%, 50% and 73.3% respectively. Table 3.4 sensitivity, specificity, PPV, NPV and efficiency of ultrasound were 36.4%, 50%, 66.7%, 22.2% and 40% respectively.

Table 3.5 show that the Q-tip test had higher sensitivity, PPV, NPV, and efficiency than ultrasound.

Table 1: Type of UI in the 30 women, as assessed by urodynamics

<table>
<thead>
<tr>
<th>Type of UI</th>
<th>No. of patients</th>
<th>Urgency and/or nocturia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>1. Genuine stress incontinence</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>2. DI or mixed incontinence</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>X² test (p value)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant

Table 2: Evaluation of BNM by Q-tip test and ultrasound

<table>
<thead>
<tr>
<th>Studied women</th>
<th>BNM by Q-tip test</th>
<th>BNM by U/S</th>
<th>X² test (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Women with prolapse and UI (n=69)</td>
<td>48</td>
<td>69.6</td>
<td>35</td>
</tr>
<tr>
<td>Women with urodynamics study (n=30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- GSI</td>
<td>15</td>
<td>83</td>
<td>5</td>
</tr>
<tr>
<td>- DI or mixed incontinence</td>
<td>7</td>
<td>58</td>
<td>7</td>
</tr>
</tbody>
</table>
Table 3. The relation between urodynamics study and BNM as assessed by Q-tip test

<table>
<thead>
<tr>
<th>Leak</th>
<th>Urodynamics study</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No leak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BNM</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>no BNM</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
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<td>4</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Sensitivity = 81.8%, specificity = 50%, efficiency = 73.35%, positive predictive value 81.8%, negative predictive value 50%

Table 4. The relation between urodynamics study and BNM as assessed by ultrasound

<table>
<thead>
<tr>
<th>Leak</th>
<th>Urodynamics study</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No leak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BNM</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>no BNM</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>BNM</td>
<td>4</td>
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<td></td>
<td>no BNM</td>
<td>4</td>
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<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Sensitivity = 36.4%, specificity = 50%, efficiency = 40%, positive predictive value 66.7%, negative predictive value 22.2%

Table 5. Comparison of the accuracy of clinical Q-tip test and sonagraphic measurement of BNM in predicting stress incontinence.

<table>
<thead>
<tr>
<th></th>
<th>Q-tip test</th>
<th>U/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>81.8%</td>
<td>36.4%</td>
</tr>
<tr>
<td>Specificity</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>PPV</td>
<td>81.8%</td>
<td>66.7%</td>
</tr>
<tr>
<td>NPV</td>
<td>50%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Efficiency</td>
<td>73.3%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Discussion

UI is a common problem, when it is associated with genital prolapse; it become a distressing condition which although rarely life threatening severely adversely affects all aspects of a woman’s quality of life. Ellerkmann et al, found in his study that 33% of the patients had anterior compartment prolapse, 19% had posterior prolapse (rectocele and enterocele) and 11% had uterine prolapse [10], while in our study 67.62% of the patients had cystocele, 64.17% rectocele, 28.98% enterocele and 18.63% had uterine prolapse. Cystocele and rectocele appear to coexist in our patients which probably reflect the same underlying aetiology that is in our society include high parity and the obstetrical malpractice by midwives and in rural area. Haylen et al, found that most urogynecology patients, have small residual urine volume and the mean residual for his patients was 14.8 ml and this comparable to our results where the mean residual was 15.1 ml [11].

Forty-nine percent of women with prolapse and UI in our study had severe type, while in a study conducted across four countries, showed that in 3.5-12.1% the incontinence was severe [13], this variation in the results may be due to that our sample of patients not reflect the general population and because of low number of patients and also may be due to the difference in the criteria chosen to determine the severity of UI. Urgency and nocturia in our study were found to be more common in those with DI or mixed incontinence than those with GSI and this is comparable to what is found in the medical literature, where the relative incidence of instability of the bladder increases with prominence of urgency and nocturia [9]. In our study, the incidence of GSI by urodynamics study was 60% and DI or mixed incontinence was 40% and these results are close to those described by Pinto et al, study where the incidence of GSI is 76.2% and that for DI or mixed incontinence is 23.8% [13]. Anatomically BNM has important aspect in the mechanism of UI, so widely accepted that preoperative evaluation of women with UI should include BNM which is assessed in our study by Q-tip test and ultrasound.

Q-tip test is abnormal in 95% of patients with GSI [14], while in our study, Q-tip test detect GSI in 83% of cases with a sensitivity, specificity, PPV, NPV, and accuracy of 81.8%, 50%, 81.8%, 50%, and 73.3% respectively. This is somewhat comparable to Joao et al. study that show that PPV and NPV of the clinical sign and test for the diagnosis of any type of UI were 97.1% and 26.7% respectively [15].

BNM assessed by ultrasound in our study was found to be abnormal in only 28% of those with GSI, its sensitivity was only 36.4%, specificity 50%, PPV
66.7% while in a study done by Pregazzi et al, the sensitivity, specificity and PPV were 87%, 68%, 55% respectively \[16\]. This variation in the validity of the test may be due to different sonographic scan machines used and different sonographers i.e. inter-observer bias. So when comparing the accuracy of Q-tip test with ultrasonographic assessment of BNM, Q-tip test is more accurate.

**Conclusions**

Urgency and nocturia are specific symptoms related to bladder dysfunction. Q-tip test is a useful clinical test and more accurate than ultrasound in detecting bladder neck mobility. Urodynamic study is expensive and time consuming, so limit its use to those with UI and urgency and nocturia as they are more likely to have bladder instability or mixed incontinence.

**Ethical Clearance:** The Research Ethical Committee at scientific research by the Iraqi Board for Medical Specializations/ Ministry of Higher Education and Scientific Research.

**Conflict of interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**


The Influence of the Use of a (Multi-Skills) Device according to the Various Exercises in the Development of the most Important Physical Abilities and Basic Skills of Futsal for Female Students

Hayder Jaber Mousa¹, Aqeel Kadhim Hadi², Wael Abbas Abdelhassen³, Thulfiqar Abdulameer Sulaiman⁴

¹Directorate General of Najaf Education/Iraq

Abstract

The research aims to identify the effect of the use of a (multi-skill) device according to various exercises in the development of the most physical abilities and basic skills of futsal. The research hypotheses show that there are significant differences in the basic physical abilities. The basic skills between the two research groups and for the benefit of female students, who used a (multi-skill) device. The research sample consisted of (24) students in the College of Physical Education and Sport Sciences in the 2017-2018 academic year. Many methods and tools were used to collect information. The researchers adopted the statistical means (SPSS). The researchers concluded that the multi-skill system has a positive effect on the development of the most important physical abilities and basic skills of futsal for female students. The most important recommendations were to emphasize the importance of using modern equipment including (multi-skills).

Keywords: Multi-Skills, Various Exercises and Futsal.

Introduction

Futsal Football, which is one of the collective games that requires male or female practitioners to be at a high level of performance in order to achieve some of the best achievements, especially when they have good physical abilities and in order to develop some physical abilities and scoring. It is necessary to study the possibilities in accordance with the requirements of the game of football futsal, the importance of research in the attempt to use a device (multi-skills) and study its impact in the development of the most important physical abilities and basic skills in futsal for female students.

The outputs of the Ministry of Education are inputs to the Ministry of Higher Education. Due to the lack of interest in physical education in schools and the lack of human and material resources, the level of some physical abilities did not rise to the level of performance of many skills for different games. Weakness in physical abilities and performance of football skills, so the problem of research is reflected in the researchers' attempt to use a (multi-skills) device and exercises aimed at improving the performance of skills in the base of football lounges.

Research aim:

The aim of the research is to identify the effect of the use of a device (multi-skills) according to the various exercises in the development of the most important physical abilities and skills of the basic futsal.

Hypothesis:

There are statistically significant differences between the pre and post testing of the experimental group and the control in the development of the most important physical abilities and basic skills of football lounges.

Research Areas:

Human Field: Students of the first stage in the Faculty of Physical Education and Sports Sciences - University of Kufa / for the academic year 2017-2018.

Time domain: Period from 1/10/2017 to 15/5/2018.

Spatial Field: Faculty of Physical Education and Sports Sciences - University of Kufa.
Search procedures:

The researchers used the experimental approach to suit the nature of the research.

Research’s Society and its Sample:

The research community was examined from the students of the first stage in the College of Physical Education and Sports Sciences / University of Kufa for the academic year 2017-2018, the number of (24) female students, the sample was chosen in a simple random way, the sample was (20) female student divided into two experimental groups and equal control.

Research tools and devices used:

1. Hall of Football Futsal is legal.
2. A (multi - skills) device.
3. Five balls five (10).
4. Mobile camera type (Galaxy) number (1).

Field Research Procedures:

Table (1). Shows homogeneity of the research sample for results.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Mean</th>
<th>SD</th>
<th>Mediator</th>
<th>Torsion coefficient</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>Cm</td>
<td>162.05</td>
<td>4.39</td>
<td>161</td>
<td>0.51</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Mass</td>
<td>Kg</td>
<td>60</td>
<td>4.35</td>
<td>60</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Year</td>
<td>19.80</td>
<td>0.67</td>
<td>20</td>
<td>0.37</td>
<td></td>
</tr>
</tbody>
</table>

Table (2). Show Parity in some physical abilities and the most important skills Basis

<table>
<thead>
<tr>
<th>Search variables</th>
<th>Units</th>
<th>The experimental group a multi-skill device</th>
<th>Control group Adopted method</th>
<th>Calculated (t) value</th>
<th>Level of significance (sig)</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Explosive power</td>
<td>Degree</td>
<td>35.30</td>
<td>5.869</td>
<td>32.50</td>
<td>6.004</td>
<td>1.05</td>
</tr>
<tr>
<td>Distinctive ability of speed</td>
<td>Time/sec</td>
<td>9.60</td>
<td>1.77</td>
<td>9.26</td>
<td>1.61</td>
<td>0.52</td>
</tr>
<tr>
<td>Handling</td>
<td>Degree</td>
<td>1.30</td>
<td>0.67</td>
<td>1.11</td>
<td>0.73</td>
<td>0.63</td>
</tr>
<tr>
<td>Scoring</td>
<td>Degree</td>
<td>1.62</td>
<td>0.93</td>
<td>1.65</td>
<td>0.96</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Characterization of tests of the most important physical abilities used in research:

First Test (Vertical jump test of stability):²

- **Purpose of the test:** Measure the explosive force of the muscles legs.
- **Devices and tools:** Wall marking, Pair of aluminum profile and nails.
- **Performance Specification:** The lab raises its arm at full length to make a sign on the blackboard, then the student swings the arms and bend the knees to the vertical jump for the maximum distance you can reach to make another sign and the arm on the entire length.
- **The conditions:** Each laboratory has three attempts to record its best.
- **Registration method:** The distance between the first and the second marks the amount of the explosive force of the legs measured by the centimeter.

The second test (the test of the leg on the man for a distance of 10 meters and for both legs):³

- **Purpose of the test:** Measure the speed of the
muscles of the legs.

- **Tools**: The area of the test shall be determined by two lines, one for the beginning and the other at a distance of 10 meters for the end, in addition to seven persons to be placed along a distance of ten meters. The distance between one person and another shall be one meter except the starting line to the end line.

- **Test administrators**: Register person; Call the names firstly and record the test performance secondly. The timer number (2) gives the start and end signal with the timing and the observation of the validity of the performance.

- **Performance Specification**: The player is on one foot to stand behind the starting line, and when he hears the signal, he jumps between the characters to the finish line and both feet.

- **Attempts**: Each player is given two attempts to the right leg and two attempts to the left leg and record the best attempts.

- **Registration method**: Calculates time to nearest 1/100 seconds.

**Tests of the most Important Skills Basis in Research:**

**First test**, Test handling a small target at a distance of (10 m).

**The purpose of the test**: Measuring the accuracy of handling.

**Tools**:

- Balls for the halls number (3).
- Tape measure.
- A small target dimensions (75 x 100 cm).

**Performance description**: The tester stands with the ball 10 meters away from the target, and when the signal is heard, it handles the ball and is stationary towards the target.

**Performance conditions**: The test starts from the ball number (1) and ends with the ball number (3).

**Registration method**:

The tester is given 3 attempts.

) 2 steps) for a successful attempt.

(One degree) to try to touch the ball or the bar.

(Zero) of the grades for the failed attempt.

**Second Test, Test balls scoring**:5

**Objective of the test**: measuring the scoring accuracy.

**Method of performance**: distributed 7 balls in the penalty area, and the student starts running behind the person on the arc of the penalty towards the first ball, aim and return to the rotation around the person, and then go to the second ball, and the player freedom to choose any foot.

**Method of registration**: The score is calculated by the total scores obtained by the student from the scoring of the seven balls as follows:

3 marks if the ball entered the specified areas (1, 3).

One mark if the ball entered the area (2).

Zero if the ball came out of the goal.

**Pre Tests**:

The tests were carried out by the experimental tests on Sunday (4/2/2018) and the closed hall of the Department of Physical Education and Sports Sciences University of Kufa and the researchers to the extent possible to confirm the conditions related to post-tests.

**Curriculum**:

The researchers prepared an educational curriculum which lasted (8) weeks, and in order to achieve the objectives of the research. The curriculum was prepared on Tuesday, 6/2/2018 and until Sunday 8/4/2018 on the experimental group as shown:

The number of the educational units in per week (2) educational units and faculty (16 educational units).

The time of the unit is 90 minutes.

The educational curriculum to teach physical abilities (explosive power and speed characteristic) week for each skill, skills handling and scoring two weeks for each skill by 4 units of education.
Working mechanism (multi-skilled):

The experimental group applied the educational curriculum using multiple physical and skill trainees by using the multi-skill system under study prepared by the researchers for the students. The curriculum began to teach the explosive force skill in the first unit to a week. The second unit taught the skill at speed and the third and fourth instruction unit Teaching the skill of handling and the fifth and sixth educational unit Teaching the skill of scoring and the seventh and eighth teaching unit of the skill of putting down and applying the exercises to be taught and developed by the teacher The use of one or more students to apply the skill.

Length of the total machine 6 m divided into three parts each part (2 meters).

Results and Discussions

Present the results of the pre and posttests of the first experimental group (multi-skill device):

Table (3). Shows the mean and standard deviation of the experimental group in the variables under consideration

<table>
<thead>
<tr>
<th>variables</th>
<th>Units</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Calculated (t) value</th>
<th>Level of significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Explosive power</td>
<td>Degree</td>
<td>35.30</td>
<td>5.869</td>
<td>40.95</td>
<td>4.41</td>
<td>5.64</td>
</tr>
<tr>
<td>Distinctive ability of speed</td>
<td>Time/sec</td>
<td>9.60</td>
<td>1.77</td>
<td>9.40</td>
<td>2.07</td>
<td>5.39</td>
</tr>
<tr>
<td>Handling</td>
<td>Degree</td>
<td>1.30</td>
<td>0.67</td>
<td>1.69</td>
<td>0.48</td>
<td>2.66</td>
</tr>
<tr>
<td>Scoring</td>
<td>Degree</td>
<td>1.62</td>
<td>0.93</td>
<td>2.25</td>
<td>0.68</td>
<td>2.93</td>
</tr>
</tbody>
</table>

Present and discuss the results of the pre and post-tests of the control group in the variables under consideration:
Table (4). Shows the mean and standard deviation of the control group in the variables under consideration

<table>
<thead>
<tr>
<th>variables</th>
<th>Units</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Calculated (t) value</th>
<th>Level of significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Explosive power</td>
<td>Degree</td>
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<td>1.61</td>
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<td>4.59</td>
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<tr>
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<td>Degree</td>
<td>1.11</td>
<td>0.73</td>
<td>1.56</td>
<td>0.78</td>
<td>2.68</td>
</tr>
<tr>
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<td>Degree</td>
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<td>0.96</td>
<td>2.11</td>
<td>1.46</td>
<td>3.73</td>
</tr>
</tbody>
</table>

**Discussion**

**Discuss the results of pre and post-tests of the experimental group:**

Table (3) shows the appearance of the differences between the two in favor of posttests. This is an indicator of the effectiveness of the independent variable represented by the use of the multi-skill system which is one of the principles of learning and to explain the reasons for the effect of the exercises used in the educational units prepared by the researchers. In the educational units that lasted for eight weeks in which the students practiced the exercises in terms of applying the educational curriculum in a scientific and thoughtful in terms of providing tools and devices as this leads to an increase in the frequency of performance of students to the skill and prove the compatibility that the high levels of activity time are required and the level must not be less than (50%) of the total time of the physical education lesson.

As well as the implementation of these exercises, which rely on the basis of gradual learning from easy to difficult has led to the promotion of learning in the most basic physical abilities and basic skills, which Mahmoud Dawood pointed out that «methods of teaching can be used to teach different aspects of activity and follow these steps step by step in order The teaching depends largely on the age of the learner and the stage of education.»

In addition to the number of repetitions and taking into account the rest times that have an impact on the development of students of the experimental group in the most basic physical abilities and basic skills in the research as pointed out (Adel Fadel, 2000) that «the frequent repetitions practiced by the learner in the course of practical application helped to gain learning».

**Discussion of the results of the pre and post-tests of the control group:**

From table (4) the control group that used the traditional method of the teacher achieved a development in the post tests of the pretests. The researchers attributed this development to the teacher’s use of the curriculum followed by physical and professional exercises which increased the intensity of the competition in addition to the number of repetitions and taking rest time. And the basic skills under consideration, as well as the teacher’s focus on the repetition of the performance of skills because the uniqueness of the research sample from the beginner, as the repetition of continuous and intensive led to a kind of typification of these capabilities and skills, which reflected in the form of the performance of motor skills is closely related to physical attributes such as speed, strength, flexibility and agility, and that the good performance of motor skill cannot succeed if it does not depend to a large extent on the physical qualities required.

**Conclusions**

A multi-skill device has a positive effect in improving some of the motor skills and the most important skills base futsal for students.

The experimental group is superior to the control group in all post-tests.
Ethical Clearance - Taken from Directorate General of Najaf Education/Iraq committee

Source of Funding - Self

Conflict of Interest - None

References


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Mental Exercises to Intensive Method and Its Effect on Motor Prediction and Some Basic Skills in Soccer for Physical Education Students - University of Anbar

Hussein Habib Mosleh

University of Anbar / Faculty of Physical Education and Sports Sciences/Iraq.

Abstract

The purpose of this study is to develop mental exercises prepared according to extensive impact on motor prediction method in soccer, while hypotheses of research dealing with there is a positive impact of mental exercises to intensive method of kinetic projection and some basic skills in soccer, and use curriculum finder The pilot sample of second graders in College of physical education-University of Anbar, and (73). And it was found that exercise and positive impact method for students and increase kinetic projection and some basic skills in football game recommendations to develop mental exercises and confirms forecast special motor football with an emphasis on mental exercises to develop other skills in the game.

Keywords: Mental exercises, motor prediction and physical education.

Introduction

The interest in the process of training and skills in various games and especially in football game contributes to improved performance through the development of programmes and units seeking to develop, taking about mental training specialists deployed within educational and training curricula. And that mental exercises in physical education programmes of great importance because it contributes to the development of cognitive abilities and mental and physical skill, mental and functional access to motor performance.

Interest in the outcome and outputs for each stage in each course brought the attention of the researcher telling them the best scientific levels for students of the faculties of physical education and sports science, as care researcher with focus on implementation of the lesson and what exercises used during those methods and how correlation between them in achieving the best results and performance skills for learners, and tie them in expectation activist football game. Through this show that there is a shortage of mental exercises for students and its impact on the student’s abilities and motor skills to fit their abilities in learning good performance, as well as using the best method of learning. Mental side has been recruited by intensive method and its effect on motor prediction and some basic skills to students in an effort to achieve the correct performance after knowing the whole picture him mentally and physically and psychologically.

The diversity of teaching methods that contribute to the educational goals and get the highest level of access also to the performance required departments and results. And that certainly find better method contributes to enhancing access to sounder means too, and from here emerged the importance in providing educational or training methods and ways for learners from physical education students through attention to mental exercise intensive method scientifically to achieve best contemplating Motor and some basic skills for learners.

Research aim:

Identify the influence of mental exercises to intensive method of kinetic projection and some basic skills in football game of college students of physical education-University of Anbar.

Hypothesis:

There are statistically significant differences between the results of two tests of pre and posttest for two groups.
There are statistically significant differences between the results of two tests post and posttest for two groups.

**Field research approach and procedures:**

Research methodology:

Follow Finder to experimental method to design two powerful brokers (Control and experimental).

**Sample search:**

Sample intentional way research students phase in College of physical education, University of Anbar (72) students, and students were excluded repeaters and University team players and clubs, absent the implementation of tests and exercises (12) students, so the sample was divided into two groups for each group (30) students. Percentage of selected research estimated sample (38.33%) of the parent society and been parity between the two groups and experimental Brigade in expectation of a simple link which reached kinetic (0.87), is a moral link at freedom (58) and level indication (0.05) table value (0.256). That variable, measured out equal between the two groups to be a commencement of Labour, table (1) show the equal groups according to error rate obtained is less than (0.05).

Table (1). Show the mean and standard deviation calculated (t) value and error rate and the indications.

<table>
<thead>
<tr>
<th>The test</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>(t)value*</th>
<th>Error rate</th>
<th>The indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictor test</td>
<td>Experimental</td>
<td>30</td>
<td>5.433</td>
<td>1.331</td>
<td>0.529</td>
<td>0.599</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>30</td>
<td>5.600</td>
<td>1.102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handling test</td>
<td>Experimental</td>
<td>30</td>
<td>30.666</td>
<td>14.840</td>
<td>0.536</td>
<td>0.594</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>30</td>
<td>28.666</td>
<td>14.076</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppression test</td>
<td>Experimental</td>
<td>30</td>
<td>11.000</td>
<td>2.017</td>
<td>0.063</td>
<td>0.950</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>30</td>
<td>10.966</td>
<td>2.075</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Morality when the error rate is less or equal to the level of significance (0.05)

**Tools, devices and means of gathering information:**

1. Include scientific sources.
2. The Internet.
3. The observation.
4. The registration form.
5. The search equipment and tools included a football field.
6. A stopwatch.
7. A measuring tape.

**The pilot study:**

The pilot study was conducted on (10) second phase students on Wednesday (17/10/2018) at 10 am and they wished to ascertain the identification of the work team assistant and duties and determine the method of testing and avoid problems and errors in the test, and confirmation On the times and exercises of the program or method used.

**Tests used in the research:**

**Testers for the measurement of motion of the football:**

**Name of the first test:** Test the self-driving expectation of the place of the football

**Objective of the test:** Measure the motion of the football.

**Test tools used:** legal soccer stadium, (12) football, registration forms and pens.
**Performance:** A player stands in the middle of a final line area 18 yards for his pitch toward the goal of football is divided into (3 parts) to form a column and is blindfolded, hit the ball directly into the goal and ask him to anticipate where the ball entry and declares to expect registrants without being seen to target, and then mate also stand on its (18th) line similarly runs and expected the first place player’s ball for fellow

**How to register:** Register to the lab after hitting the ball was the fall ball into the target partition or areas outside the target or not, and calculates the degree of every sign is that six attempts, then leads fellow six strikes to be a total forecast when the twelve attempts to try a number that gets in it. The player’s highest score in the test.

**Notes:** Test has steadfastly 89% and 91.7% amounted to subjective sincerity honestly rate virtual expert and substantive agreement with my 100%.

**Skills tests:**

**Test Name:** Ability to control the ball:

**Objective of the test:** To measure the ability of the player to control the ball through absorption or mute.

**Tools:** balls number (3), tape measure

**Performance description:** Two concentric circles centered on the radius of the micro (1 meter) and the large diameter (2 meter) and at a distance of (10) m of the circle draws a line length (2 meter). The line of throwing the ball begins test that the laboratory stands in the middle of the lower circle and the coach stands on the line of throwing and the ball in his hand. When the signal is given, the trainer will throw the ball into the arc of the laboratory player within the circuit that is trying to control it in any part of the body. Each laboratory will be given three attempts.

If the player succeeds in controlling the ball within the lower circle he gets (30) score, but if the player succeeds in controlling the ball within the circle of the major gets (20) degree, either if the ball out of the two circles under control gets (zero). The final score is the total score of the three attempts.

**Test Name:** Intermediate Handling test:

**Objective of the test:** Measure the accuracy of the medium handling.

**The tool used:** (10) balls, measuring tape.

**Method of performance:** We draw four concentric circles, whose diagonals are respectively (4), (8), (12), (16) feet and given degrees respectively, (1, 2, 3, 4) where the center of the circle is the point of distance between the line Start or four circles, which are at a distance of (20) yards, but in the case of the ball outside the four circles, the attempt is unsuccessful as in the figure.

**Registration:** Each player is given two attempts, each attempt (10) consecutive balls and any of the feet in the air trying to drop in the small circle and the total score of the test is the total of what the player gets in the attempts.

**Field experience:**

**Pre Test:**

The pretest was conducted on the morning of Wednesday (22/10/2018) at ten o’clock on the sample of the two groups of control and experimental.

**Main experience:**

The application of mental exercises as an extension (2) on Monday, 29.10.2018 for a period of 8 weeks until on Monday 31/12/2018, has been carried out exercises mental neo-intensive experimental group of students from the second phase of the Division (b) in the main part of the units of education and by(25) minutes note that the total time of the part (40 minutes) and ensure that the main part of four exercises implementation of exercises from four weeks have been repeated to be number eight weeks as described below:

The first is the mental exercise intensive - to find the level of ideal excitement, and the second is the mental exercise intensive - to identify the sources of distractibility as well as the third is the mental exercise intensive linked to skillfully handling -Identify positive and negative perceptions of the fourth is also the mental exercise intensive associated with skill suppressions - learn how to pay attention and focus.

**Post-test:**

The post-test was conducted on Monday morning, January 7, 2018, at 10 am. The test was conducted under the same conditions as the pretest.
Results:

View and discuss the results of the control and experimental groups:

Table (2). Shows the mean and standard deviations with the calculated value (t) of the control and experimental groups in the test under study.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Variables</th>
<th>Tests</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t)value</th>
<th>Error rate</th>
<th>The indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Predictor test</td>
<td>Pretest</td>
<td>2.5</td>
<td>0.306</td>
<td>8.168</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Handling test</td>
<td>Pretest</td>
<td>6.33</td>
<td>2.323</td>
<td>2.726</td>
<td>0.011</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
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<td>Posttest</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Suppression test</td>
<td>Pretest</td>
<td>2.4</td>
<td>0.700</td>
<td>3.425</td>
<td>0.002</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
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<td>Posttest</td>
<td></td>
<td></td>
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<tr>
<td>Control</td>
<td>Predictor test</td>
<td>Pretest</td>
<td>0.8</td>
<td>0.316</td>
<td>2.533</td>
<td>0.017</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handling test</td>
<td>Pretest</td>
<td>3.33</td>
<td>1.683</td>
<td>1.98</td>
<td>0.57</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suppression test</td>
<td>Pretest</td>
<td>0.266</td>
<td>0.135</td>
<td>1.975</td>
<td>0.058</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Morality when the error rate is less or equal to the level of significance (0.05)

Table (2) shows that there is a significant significance of the tests under study for the experimental group between the pre and remote tests and for the benefit of the post-test because the error rate is less than the significance level (0.05). There was no significant significance of the variables under study between the pre and post tests of the control group because the error rate was greater than the significance level (0.05), except the motor prediction test had a significant indication that the error rate was less than the significance level (0.05).

Table (3). Show the mean and the standard and calculated deviations of the control and experimental groups in the tests under study

<table>
<thead>
<tr>
<th>Tests</th>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>(t)value</th>
<th>Error rate</th>
<th>The indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictor test</td>
<td>Experimental</td>
<td>30</td>
<td>7.933</td>
<td>1.081</td>
<td>4.846</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>30</td>
<td>6.400</td>
<td>1.354</td>
<td></td>
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<td></td>
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<tr>
<td>Handling test</td>
<td>Experimental</td>
<td>30</td>
<td>37.000</td>
<td>12.077</td>
<td>2.461</td>
<td>0.017</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
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<td>28.66</td>
<td>14.07</td>
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<td></td>
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<tr>
<td>Suppression test</td>
<td>Experimental</td>
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</tr>
<tr>
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<td>30</td>
<td>11.233</td>
<td>1.924</td>
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<td></td>
</tr>
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</table>

* Tabular value (2.018) to the degree of freedom (60-2 = 58) at the level (0.05).
Table (3) shows that there are significant differences in the post-test between the experimental and control groups and for the benefit of the experimental group in all variables under study because the error rate is less than the significance level (0.05).

**Discussions**

Table (2) shows that there is a significant difference between the results of the pre and posttests of the experimental group in the expected range. The difference was also significant in the control group, indicating that the mental exercises of both groups were carried out in different ways within the teaching methods of the students in improving the motor expectation of both groups. Only a slight improvement in the control group in the technical variables not to link fatty exercise skill as it was in the experimental group. The researcher also refers to this improvement in learning for the experimental group when it is ready to practice and practice with the explanation of Walt According to the scientific basis, the development of any skill, and that mental training leads to a significant positive transfer in the teaching of skill as a result of the perception of performance without being associated with a virtual act and that learning affects the other behavior of the individual and improve it to the best and be a cause of progress as well Motivational learning to change performance through the practice, inclination, experience and environmental factors in which the learner lives and that the adoption of intensive method confirmed the regularity of repetitions and rest in the application of skill according to compatibility with the work of muscular nervous system and this was confirmed by researchers that the process of time distribution to lead the learner to the skill and linked to exercise in time with the increase in frequency and lack of rest or lack thereof, which determines the size of performance and need To neuromuscular compatibility.

Table (3) indicates the effect of exercise on improving the motor expectation and basic skills of the experimental group students in the post-test between the two groups because intensive-style exercises have established a good dynamic expectation of the students of the College of Physical Education and Sports Sciences.

The research also attributes this result to the development of the diversity of exercises and its focus on the most important indicators of mental exercise and its variety and arrangement, which is confirmed by Wajih Mahjoub, because the skill of the order is affected by several factors, including training and readiness and scalability developed by explaining and clarifying the use of scientific means. Intensive exercise is one of the best ways to develop skills based on the size of performance with the compatibility of performance with appropriate frequency, far from the conditions of fatigue, despite the reduction of rest between As Schmid (1999) suggests that mental training affects the performance of motor skill and that it introduces into learning the cognitive elements of skill and how to learn skill as well as it helps the learner to think.

The development of the motor and skill prediction of the experimental group is more evident than that of the control group, which develops its motor and skill prediction in a simple way they are The result of exercise and practice, as well as the news gained in the implementation of the method followed, and depends on the dynamic expectation of the basic elements of the correct analysis of the movement as a result of the experience of the player as well as the flexibility of mobility and the extent of sense of distance and time with the prediction of the position of motor and that the dynamic prediction develops by several factors including concentration and movement, sequence of movements and exercises and linking it to skillful performance to improve the skill of the players.

The researcher believes that mental exercises contribute to the development of motor skills, including the motor and skill prediction of the association with the intensive method, which contributes to the promotion to achieve performance to the best levels when improving the performance of football players.

**Conclusions**

Intensive exercise in the intensive method used to have a positive impact on the expectations of movement and skill of football.

The approach adopted by the trainer has a positive impact on improving the motor expectation and a slight improvement in learning the skills studied.

Intensive exercises in the intensive method achieved a preference for the experimental group on the control group.
Ethical Clearance - Taken from University of Anbar committee

Source of Funding - Self

Conflict of Interest - None

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Comparative Anti-Inflammatory Effect of Risperidone Versus Olanzapine in Schizophrenic Patients

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²Department of Pharmacology and Toxicology, College of pharmacy, University of Mosul, Iraq,
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Abstract

Background and objectives: schizophrenia is a major public disease associated with a non-overt inflammation. Tumour necrosis factor alpha (TNFα) is an important pro-inflammatory marker involved in initiation and propagation of the immune response. Various studies carried out on schizophrenic patients showed an elevation of proinflammatory factors-like TNFα. Furthermore, it has been reported that these markers play a role in the aetiology of schizophrenia. In fact, recent studies indicated that antipsychotic drugs modulate the level of these markers. The present study aimed to describe the role of antipsychotic medications on the alteration of TNFα level.

Methods: serum levels of TNFα in schizophrenic patients were measured and compared with those of the apparently healthy control subjects. Two commonly prescribed antipsychotics; olanzapine and risperidone, were included in the study.

Results: the results showed that both drugs (olanzapine (p<0.05) and risperidone (p<0.001)) significantly reduced TNFα level compared to baseline and control levels, moreover, the onset of reduction was 4-weeks earlier with risperidone compared with olanzapine.

Interpretation and conclusions: the study concluded that the anti-inflammatory potency of risperidone is higher than olanzapine and the onset of anti-inflammatory action initiated earlier with the risperidone therapy compared to olanzapine; showing a priority of risperidone for an application in first-episode drug-naive schizophrenia and acute schizophrenic attacks.

Keywords: olanzapine, risperidone, TNFα, schizophrenia, antipsychotic.

Introduction

Schizophrenia is a chronic debilitating mental disease characterised by severe psychosocial dysfunction and the incidence is quite high in general population reaching up to 0.8%⁰.¹. The underlying mechanisms of schizophrenia are obscure. Recent studies indicated that the pathophysiology of the disease might be linked to immune system³.⁴. This assumption was supported by the improvement in neuroinflammation following anti-inflammatory prescription for schizophrenia⁵. Cytokines are signalling molecules between the immune system and central nervous system (CNS). They play an important role not only in the cell-cell communication but also in the function of the immunocytes in the central nervous system (CNS)⁶. Some of these cytokines (e.g. tumour necrosis factor alpha (TNFα), interleukin (IL)-1, IL-2, and IL-6) have been demonstrated to involve in immune-neuro-endocrine signalling and control of neuronal function in the CNS in healthy status and disease⁷.⁸.⁹.

TNFα is a pro-inflammatory cytokine which has an effect in most tissues and organs of our body including CNS. In CNS, TNFα is either produced by certain neuronal cell populations including microglial cells and astrocytes⁸,¹¹ or crossed the blood brain barrier during systemic inflammation¹². Various studies reported discrepant results regarding TNFα level in schizophrenic patients; unchanged, decreased, or increased¹².
It has been found that the total Positive and Negative Syndrome Scale (PANSS) scores were correlated to plasma TNFα levels suggesting that TNFα may have a role in the aetiology of schizophrenia\textsuperscript{13}. However, antipsychotic medications might be involved in the modulation of TNFα levels because almost all patients involved in these studies were on antipsychotic therapy. Therefore, the TNFα levels in schizophrenic patients need to be investigated in order to explore its effect on the disease status and subsequent prognosis. In the present study, we have aimed to determine the role of antipsychotic medications on modulation of TNFα levels, if any. To do so, two structurally different miscellaneous antipsychotic; olanzapine (thienobenzodiazepine) and risperidone (benzisoxazole), were included in the study, the two selected medications were characterised globally by high prescription rate.

**Subjects and Method**

**Subjects:**

A total of 60 newly diagnosed schizophrenic patients aged 18–55 years old participated in the present study. Samples were collected from the Psychiatry Unit of Al-Salam teaching hospital in Ninaveh Governorate, Iraq. Psychiatrists diagnosed the patients using a psychiatric semistructured clinical interview schedule which is approved in diagnosing schizophrenia. The medical history of the patients was evaluated to exclude any systemic disease that may impair the parameters to be diagnosed, including diabetes, liver disease, and renal disease; which are considered as an exclusion criterion. The patients were placed on continuous treatment of either olanzapine 10 mg/day (n=30) or risperidone 2 mg/day (n=30) as antipsychotics for schizophrenia. To ascertain that the patients were free from any acute phase reaction due to infection or inflammation, serum C-reactive protein (CRP) was diagnosed and found to be negative in all the samples tested (CRP < 6 mg/L).

Ethical approval was considered from the patients or their first-degree relatives. To achieve comparison of parameters, a total of 30 healthy subjects were randomly selected as the control group. Sex and age of these subjects were nearly comparable with that of the patients. These subjects were checked for any apparently health, emotional and physical problems. Serum CRP was also negative in the control group samples.

**Method**

The serum TNFα were estimated using an enzyme-linked immunosorbent assay (ELISA) supplied by RayBio®, USA. The serum CRP was measured using a semiquantitative agglutination kit supplied by Spinreact®, Spain. The serum and reagents were mixed, and agglutination occurred, and the result showed that the CRP ≥ 6 mg/L.

**Statistical Analysis**

The results of the normally distributed variables were expressed as (mean ± standard deviation). Mann–Whitney U test was used to compare the measured parameters between the patients (olanzapine-treated group versus risperidone-treated group) and the healthy control groups. The difference between the groups was statistically different when \( p < 0.05 \). All statistical analyses were performed using GraphPad Prism 6 (CA, USA). The figures were created using a Microsoft Office 2010 Excel program.

**Results**

Demographic and clinical characteristics of patients and controls:

Table 1 represents the demographic and clinical characteristics in schizophrenia patients and control groups.
Table 1: Demographic characteristics of patients and controls

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Schizophrenic patients</th>
<th>HCG (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OTG (n=30)</td>
<td>RTG (n=30)</td>
</tr>
<tr>
<td>Gender (male: female)</td>
<td>15:15</td>
<td>13:17</td>
</tr>
<tr>
<td>Age (year)</td>
<td>20-52</td>
<td>18-55</td>
</tr>
<tr>
<td>BMI (kg/m^2)</td>
<td>23.5</td>
<td>25</td>
</tr>
<tr>
<td>Demographic area (urban: rural)</td>
<td>27:3</td>
<td>23:7</td>
</tr>
<tr>
<td>Education (literate: illiterate)</td>
<td>10:20</td>
<td>12:18</td>
</tr>
<tr>
<td>Employment status (employed: not employed)</td>
<td>0:30</td>
<td>1:29</td>
</tr>
<tr>
<td>Smoking: not smoking</td>
<td>9:21</td>
<td>10:20</td>
</tr>
</tbody>
</table>

OTG: olanzapine-treated group, RTG: risperidone-treated group, HCG: healthy control group, BMI: body mass index, kg: kilogram, m^2: square meter.

TNFα levels comparison between groups

The results of serum TNFα in schizophrenia, and control groups are presented in figure (1).

The result of analysis indicates that the level of TNFα in schizophrenia is significantly higher than control healthy subject. The antipsychotic drugs have significantly (olanzapine (p<0.05) and risperidone (p<0.001)) reduced the TNFα level after the course of therapy. Risperidone induced stronger reduction of TNFα level compared to olanzapine. Moreover, the reduction of TNFα induced by risperidone is earlier than that induced by olanzapine, since risperidone induced its significant reduction of TNFα with in first 4 weeks, this effect was achieved with olanzapine after 8 weeks of initiation of therapy.

![Figure 1. Olanzapine and risperidone reduced plasma TNFα concentration.](image-url)
(A and B) olanzapine and risperidone reduced TNFα level significantly as compared to control samples or baseline of patient samples. (C) risperidone induced the reduction in TNFα level within 4 weeks while olanzapine needed longer time to reduced TNFα level. Data expressed as mean±SD (n=30) #p<0.05 ##p<0.001 as compared to control group, *p<0.05 **p<0.001 as compared to baseline TNFα levels, OTG: olanzapine treated group, RTG: risperidone treated group, HCG: healthy control group, NS=non-significant.

**Discussion**

In the present study, we have investigated that TNFα level was elevated in psychotic patients compared to healthy control subjects and that their treatment with antipsychotic drugs were associated with the reduction in plasma level of TNFα (Figure 1A and B). However, the onset and intensity of reduction were far more prominent with risperidone compared to his counterpart; olanzapine (Figure 1C). Studies focused on the role of cytokines on schizophrenia has reported discrepant results. Some studies have shown elevated plasma TNFα and IL-6 levels and reduced IL-2 levels namely a decreased interleukin-2 (IL-2), however, others have reported no change in the cytokine levels. Inglof et al reported a correlation between interferon gamma (IFNγ) levels and aetiology of schizophrenia. Their results showed increased IFNγ in patients with positive symptoms and reduced IFNγ in patients with negative symptoms. Conversely, other researchers have found elevated serum/plasma IFNγ levels in schizophrenia. It has recently been confirmed that antipsychotic medications modulate cytokine production. The results of our study indicated that TNFα levels were upregulated in overall patients regardless of the predominance of positive or negative symptoms (Figure 1A and B).

It has been reported that antipsychotic have a different effect on cytokine levels. A meta-analysis study on schizophrenic patients on antipsychotic therapy, showed elevated sIL-2R and decreased IL-1B and IFNγ. Nevertheless, its uncertain whether these alterations in cytokine levels are solely linked to anti-schizophrenic medications, or whether they are linked to the improvements in the pathophysiology of the disease. Moreover, the heterogenous results is being reported despite of using single antipsychotic drug with variation between in vitro and in vivo studies, stages of the disease, and subtype of schizophrenia. In an in vitro study, it has been reported that some antipsychotics increase IL-17 levels, specifically risperidone has shown an immunosuppressive activity by inhibiting IL-12 production by Th1 cells and increasing IL-10 production by Th2 cells and pro-inflammatory cytokines (IL-6, IL-8, and TNFα). Additionally, risperidone showed a potent inhibitory activity on the production of TNFα, IL-6, and IL1B by IFN-γ-pretreated microglia. In laboratory animals, LPS-induced neuroinflammation model, risperidone has shown a clear suppression on TNFα and IL-6 and upregulation in IL-10. In the line with these studies, our results indicated that antipsychotics reduced TNFα in almost all patients (Figure 1A and B).

Inconsistent results have been reported regarding anti-inflammatory activity of risperidone. It has been shown that risperidone inhibit the production of IL-6 and TNFα, increase IL-10 anti-inflammatory cytokine while plasma IL-4 shown no change, and in IFN-γ-activated microglia risperidone induced beneficial immunomodulation effects. In this study, we have focused on 2 antipsychotics commonly prescribed in schizophrenia and TNFα was used as an anti-inflammatory marker, the results indicated that both drugs reduced TNFα level, moreover, risperidone shown stronger and earlier action than olanzapine (Figure 1C).

Risperidone suppressed TNFα and IL-6 production and increased IL-10 production in in vitro LPS-induced neuroinflammation model using laboratory animals. Moreover, risperidone suppressed LPS-induced expression of proinflammatory markers and restored anti-inflammatory pathways suppressed by LPS. Recently, it has been reported that atypical antipsychotics may elevate IFNγ and decrease IL-4, IL-6, and IL-27 levels in schizophrenic patients. The data of the present study demonstrate significant stimulation of immune responses in schizophrenic patient despite of the absence of any other inflammatory disorder. Therefore, schizophrenia can be regarded as inflammatory disorder, and the use of immunomodulatory drugs as adjuvant treatments is under investigation for more applications.

**Conclusion**

In summary, our data showed that TNFα level was elevated in schizophrenic patients. The elevated TNFα might be linked to the pathology and/or the progression of the disease. The increased TNFα might be associated with positive or negative symptoms or both; further
studies required to confirm such correlation. The antipsychotic therapy reduced TNFα level in the schizophrenic patients and there is a clear difference between the 2 antipsychotic drugs regarding their effects on TNFα levels demonstrated by stronger and earlier effect of risperidone compared to olanzapine therapy. Further clinical studies are recommended to confirm the relation between the TNFα levels, and treatment with the antipsychotic in relation to the progression of the disease. However, this study gives an evidence that there is an immune change that may be linked to the progression of the disease? The study also suggests that immunomodulating therapy may become a new approach of therapy for schizophrenic patients.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from College of Pharmacy Research Ethics Committee

References


Effect of Adding Local Minerals Clay (Meqdadia) in the Female Japanese quail Diets upon Production Performance, Egg Quality and Carcass Traits

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2 Applied geology department, Collage of Science, University of Kirkuk, Iraq

Abstract

One hundred and twenty of adaptable females Japanese quail aged 24 weeks were affected to five dietary treatments and six replicate (4 bird/replicate) per dietary treatments. T1 (control treatment) without clay, T2, T3, T4 and T5 were add local mineral clay (Meqdadia) with 0.5%, 1%, 1.5%, and 2% of diet respectively. Adding 2% of local mineral clay (Meqdadia) to the diet is significantly (p≤0.05) increased egg production, while the egg mass of the control treatment significantly decreased comparing to the diets contained 0.5%, 1%, 1.5% and 2% of local mineral clay (Meqdadia). The bird of fifth treatment significantly (p≤0.05) consumed higher diet and energy comparing with the birds of control treatment. No significant difference in the feed, energy and protein conversion ratio among the bird of all treatments. Egg shell thickness (mm) and shell weight (%) were significantly (p≤0.05) higher by adding local mineral clay (Meqdadia). On other hand the difference in the percentage weight of the carcass parts were no significant among all treatments.

Keywords: Clay, performance, egg quality, quail.

Introduction

Any major reduction or decrease in the cost of feed will extensively reduce the overall cost of production and increase the profile margin of the farm1. Recent studies including supplementation minerals clays (muds) as feed additive (natural additive) have direct beneficial effects (positive effects) upon poultry performance2. The clay is a natural product that can be economically used to achieve healthy digestive tract and optimize poultry performance3. Clays are also recommended for their nutritional properties and healthy digestive tract and for their antitoxic capacity to many undesirable substances in the gut and have positive effect on the digestive efficiency and dropping moisture3. Therefore the aim of this study was to evaluate over egg production period of 60 days, the effect of 0%, 0.5%, 1%, 1.5% and 2% of local mineral clay (Meqdadia) on the egg production, egg quality and carcass traits of females Japanese quail.

Materials and Method

One hundred twenty female local Japanese quail 24 weeks of age were used. The birds were housed in battery (cages measuring 40*30*20 cm Length, width and height respectively) in an environmentally controlled room. Five dietary treatments were then randomly distributed to the 30 experimental units (30 cages). Therefore each treatment was replicated six times (6cages). Birds were fed on the experimental diets for ten days pretest period for adaptation to the experimental diets, followed by a 60 days test period. Feed and water were available ad libitum and the birds received 17 h of light daily. Meqdadia clay which described as (LMCM) obtained from Meqdadia, Iraq. The chemical compounds of LMCM is shown in table 2. The level of the LMCM were 0.0 %, 0.50%, 1.50% and 2.0 % in the experimental diets (table 1). Birds were weighted at beginning and at the end on the experiment. Egg were collected daily and egg production were expressed on a hen hay basis. All egg laid, egg weight, feed intake and feed conversion ratio recorded by 20 days. To determine the egg internal, shell quality traits and egg shape index,
egg laid collected randomly from each treatments (2 eggs from each replicate) each 20 days.

Table 1. The feed ingredients of the dietary treatments

<table>
<thead>
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<th>Treatments</th>
<th>Feed stuff (%)</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td></td>
<td>61.13</td>
<td>60.63</td>
<td>59.63</td>
<td>59.08</td>
<td>58.63</td>
</tr>
<tr>
<td>Soybean meal (48% cp)</td>
<td></td>
<td>26</td>
<td>26</td>
<td>26.25</td>
<td>26.25</td>
<td>26.10</td>
</tr>
<tr>
<td>Sunflower oil</td>
<td></td>
<td>4.62</td>
<td>4.62</td>
<td>4.87</td>
<td>4.92</td>
<td>5.02</td>
</tr>
<tr>
<td>LMCM&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td>0</td>
<td>0.5</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
</tr>
<tr>
<td>Di calcium phosphate</td>
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<td>1.94</td>
<td>1.94</td>
<td>1.94</td>
<td>1.94</td>
<td>1.94</td>
</tr>
<tr>
<td>Limestone</td>
<td></td>
<td>5.34</td>
<td>5.34</td>
<td>5.34</td>
<td>5.34</td>
<td>5.34</td>
</tr>
<tr>
<td>Vitamin-mineral premix</td>
<td></td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
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<tr>
<td>Salt (Nacl)</td>
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<td>0.2</td>
<td>0.2</td>
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<tr>
<td>Methionine</td>
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<td>0.2</td>
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<tr>
<td>Lysine</td>
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<td>0.22</td>
<td>0.22</td>
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<td>Choline chloride (60%)</td>
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<tr>
<td>TOTAL (%)</td>
<td></td>
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<td>100</td>
<td>100</td>
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Chemical calculated analysis<sup>2</sup>

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<tr>
<th></th>
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<th>T4</th>
<th>T3</th>
<th>T2</th>
<th>T1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolism Energy (kcal/kg feed)</td>
<td>2990</td>
<td>2990</td>
<td>2990</td>
<td>2990</td>
<td>2990</td>
</tr>
<tr>
<td>Crude protein (%)</td>
<td>20.36</td>
<td>20.35</td>
<td>20.35</td>
<td>20.28</td>
<td>20.15</td>
</tr>
<tr>
<td>C:P Ratio</td>
<td>143.3</td>
<td>143.3</td>
<td>143.3</td>
<td>143.2</td>
<td>143.7</td>
</tr>
<tr>
<td>Methionine (%)</td>
<td>0.49</td>
<td>0.49</td>
<td>0.49</td>
<td>0.49</td>
<td>0.49</td>
</tr>
<tr>
<td>Lysine (%)</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
<td>1.14</td>
</tr>
<tr>
<td>Calcium (%)</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
<td>2.50</td>
</tr>
<tr>
<td>Available phosphorus (%)</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
<td>0.35</td>
</tr>
</tbody>
</table>

<sup>1</sup> LMCM : local mineral clay meqdadia

<sup>2</sup> According to NRC, (1994)

Table 2. Chemical compound of LMCM<sup>1</sup>

<table>
<thead>
<tr>
<th>Element</th>
<th>Amount (%)</th>
<th>Element</th>
<th>Amount (ppm)</th>
<th>Element</th>
<th>Amount (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na&lt;sub&gt;2&lt;/sub&gt;O</td>
<td>0.043</td>
<td>Co</td>
<td>19.7</td>
<td>Sn</td>
<td>0.9</td>
</tr>
<tr>
<td>MgO</td>
<td>6.372</td>
<td>Ni</td>
<td>148.1</td>
<td>Sb</td>
<td>0.8</td>
</tr>
<tr>
<td>Al&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;3&lt;/sub&gt;</td>
<td>9.072</td>
<td>Cu</td>
<td>28.3</td>
<td>Te</td>
<td>1.1</td>
</tr>
<tr>
<td>SiO&lt;sub&gt;2&lt;/sub&gt;</td>
<td>41.24</td>
<td>Zn</td>
<td>52.9</td>
<td>I</td>
<td>6.1</td>
</tr>
<tr>
<td>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>0.1186</td>
<td>Ga</td>
<td>11.7</td>
<td>Cs</td>
<td>3.6</td>
</tr>
<tr>
<td>SO&lt;sub&gt;3&lt;/sub&gt;</td>
<td>0.1171</td>
<td>Ge</td>
<td>0.4</td>
<td>Ba</td>
<td>380.9</td>
</tr>
<tr>
<td>Cl</td>
<td>0.0004</td>
<td>As</td>
<td>6</td>
<td>La</td>
<td>27.2</td>
</tr>
<tr>
<td>K&lt;sub&gt;2&lt;/sub&gt;O</td>
<td>1.366</td>
<td>Se</td>
<td>0.3</td>
<td>Ce</td>
<td>31.4</td>
</tr>
<tr>
<td>CaO</td>
<td>17.64</td>
<td>Br</td>
<td>0.8</td>
<td>Hf</td>
<td>5.9</td>
</tr>
<tr>
<td>TiO&lt;sub&gt;2&lt;/sub&gt;</td>
<td>0.5965</td>
<td>Rb</td>
<td>47.5</td>
<td>Ta</td>
<td>3.7</td>
</tr>
<tr>
<td>V&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>0.0254</td>
<td>Sr</td>
<td>254.1</td>
<td>W</td>
<td>3</td>
</tr>
</tbody>
</table>
### Cont.. Table 2. Chemical compound of LMCM

<table>
<thead>
<tr>
<th>Chemical Compound</th>
<th>Concentration (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cr₂O₃</td>
<td>0.0438</td>
</tr>
<tr>
<td>MnO</td>
<td>0.2052</td>
</tr>
<tr>
<td>Fe₂O₃</td>
<td>4.956</td>
</tr>
<tr>
<td>LOI</td>
<td>18.81</td>
</tr>
<tr>
<td>LOI</td>
<td>18.81</td>
</tr>
<tr>
<td>Cd</td>
<td>0.8</td>
</tr>
<tr>
<td>In</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Analyzed at the laboratories of Earth science applications and research – Ankara University - Turkey.

1 LMCM: local mineral clay meqadia

### Statistical Analysis

All data were analyzed using the GLM procedure of SAS software for analysis of variance as completely randomized design (CRD). Significant difference among treatments means were tested by applying Duncan’s multiple range test.

### Results and Discussion

Table 3 shown the effect of adding LMCM in the diets of female Japanese quail upon production performance. A significant difference (p ≤ 0.05) were found in the egg production (H.D.%) and egg mass (gm egg/bird/day) for the birds of T5 (78.53 and 7.48) by compared that with the birds of T1 (64.40 and 5.19). On the other hand the birds of the fifth treatment (2% LMCM) consumed feed significantly (p ≤ 0.05) higher than the birds of the control treatments (T1), while the difference between the T1 (control) and T5 were no significant for the feed conversion ratio, energy conversion ratio and intake and conversion ratio of protein, while the energy intake of the birds of the T5 were significantly higher than the bird of the control group (T1). The improvement in the egg production (H.D.%) and egg mass (gm egg/bird/day) by supplementation 2% of LMCM in the diet might be explained that LMCM usage may increase improved energy efficiency and slowed down feed passage. The digest retention time and therefore the endogenous enzyme activity might be more effective in the digestion of the protein, fat and carbohydrate and improve their absorption to promote healthy digestive tract and to enhance performance.

### Table 3. Effect of adding LMCM in the diets of female Japanese quail upon production performance (mean ± SE)

<table>
<thead>
<tr>
<th>Treatment Traits</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.D. (%)</td>
<td>64.40 ± 2.70 d</td>
<td>76.06 ± 1.65 Ab</td>
<td>71.10 ± 0.38 Bc</td>
<td>70.21 ± 1.46 C</td>
<td>78.53 ± 1.8 a</td>
</tr>
<tr>
<td>Egg weight (gm)</td>
<td>8.09 ± 0.36 b</td>
<td>8.42 ± 0.76 b</td>
<td>9.03 ± 0.36 B</td>
<td>10.62 ± 0.25 A</td>
<td>9.53 ± 0.47 ab</td>
</tr>
<tr>
<td>Egg mass (gm/bird/day)</td>
<td>5.19 ± 0.27 b</td>
<td>6.39 ± 0.59 a</td>
<td>6.42 ± 0.24 A</td>
<td>7.44 ± 0.2 A</td>
<td>7.48 ± 0.41 a</td>
</tr>
<tr>
<td>Feed intake (gm/bird/day)</td>
<td>19.98 ± 1.54 c</td>
<td>23.48 ± 0.38 bc</td>
<td>24.62 ± 1.06 Ab</td>
<td>25.51 ± 0.86 Ab</td>
<td>27.42 ± 1.87 a</td>
</tr>
<tr>
<td>F.C.R (gm diet/gm egg)</td>
<td>3.86 ± 0.27 a</td>
<td>3.92 ± 0.39 a</td>
<td>3.87 ± 0.25 A</td>
<td>3.44 ± 0.17 A</td>
<td>3.73 ± 0.3 a</td>
</tr>
<tr>
<td>Energy intake (Kcal/bird/day)</td>
<td>58.54 ± 4.53 b</td>
<td>68.57 ± 1.11 ab</td>
<td>71.83 ± 3.1 A</td>
<td>74.1 ± 2.51 A</td>
<td>79.41 ± 5.42 a</td>
</tr>
<tr>
<td>Energy conversion ratio (Kcal/gm egg)</td>
<td>11.32 ± 0.8 a</td>
<td>11.46 ± 1.16 a</td>
<td>11.31 ± 0.74 A</td>
<td>10.01 ± 0.5 A</td>
<td>10.8 ± 0.89 a</td>
</tr>
<tr>
<td>Protein intake (gm/bird/day)</td>
<td>4.08 ± 0.31 a</td>
<td>4.78 ± 0.07 ab</td>
<td>5.01 ± 0.21 A</td>
<td>5.17 ± 0.17 A</td>
<td>5.52 ± 0.37 a</td>
</tr>
<tr>
<td>Protein conversion ratio (gm protein/gm egg)</td>
<td>0.78 ± 0.05 a</td>
<td>0.79 ± 0.08 a</td>
<td>0.78 ± 0.05 A</td>
<td>0.69 ± 0.03 A</td>
<td>0.75 ± 0.06 a</td>
</tr>
</tbody>
</table>
Values followed with the same letters are not significantly different from each other according to Duncan’s Multiple Range test at (5%) level.

1 LMCM : local mineral clay meqdadia

T1 : control, T2, T3, T4 and T5: adding 0.5%, 1%, 1.5% and 2% of LMCM respectively

Table 4 shown the effect of adding LMCM in the diets of female Japanese quail upon egg quality traits, Dietary LMCM 2% (T5) supplementation significantly improvement the shape index, egg specific gravity, egg shell thickness and shell weight comparing with control dietary group (T1). Improving shell quality above might be explained that the 2% LMCM may increase calcium utilization. On other hand dietary treatments (levels of MC in the diets) did not significantly affect to egg surface area, yolk index, yolk weight percentage, albumin index, haugh unit and albumin weight percentage. However15,16 reported that egg shape index, breaking strength, shell thickness and haugh unit were not affected by the usage of Sepiolite, while11 reported the dietary treatments 0.5% or 1 % Sepiolite did not significantly effect on egg shape index, egg albumin higher, egg albumin index, egg yolk index and high unit for layer hens egg.

Table 4. effect of adding LMCM1 in the diets of female Japanese quail upon egg quality traits (mean ± SE)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape index (%)</td>
<td>76.72 ± 0.84</td>
<td>74.70 ± 0.1</td>
<td>79.26 ± 0.69</td>
<td>74.53 ± 0.56</td>
<td>79.85 ± 0.6</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>c</td>
<td>A</td>
<td>c</td>
<td>a</td>
</tr>
<tr>
<td>Egg specific gravity (%)</td>
<td>1.08 ± 0.00</td>
<td>1.10 ± 0.00</td>
<td>1.09 ± 0.00</td>
<td>1.09 ± 0.00</td>
<td>1.10 ± 0.00</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>a</td>
<td>bc</td>
<td>bc</td>
<td>ab</td>
</tr>
<tr>
<td>Egg surface area (cm²)</td>
<td>19.16 ± 0.64</td>
<td>19.66 ± 1.36</td>
<td>20.83 ± 0.64</td>
<td>23.53 ± 0.42</td>
<td>21.67 ± 0.8</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>yolk index (%)</td>
<td>29.93 ± 2.91</td>
<td>30.63 ± 3.28</td>
<td>34.33 ± 2.69</td>
<td>40.97 ± 3.11</td>
<td>36.63 ± 2.57</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>yolk weight percentage (%)</td>
<td>51.56 ± 1.98</td>
<td>41.50 ± 4.36</td>
<td>43.74 ± 3.31</td>
<td>42.96 ± 1.17</td>
<td>47.68 ± 1.92</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>Albumin Index (%)</td>
<td>12.05 ± 0.76</td>
<td>11.27 ± 1.21</td>
<td>11.22 ± 0.46</td>
<td>12.55 ± 0.4</td>
<td>16.86 ± 5.18</td>
</tr>
<tr>
<td></td>
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<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Haugh Unit</td>
<td>89.96 ± 0.8</td>
<td>87.04 ± 2.88</td>
<td>89.45 ± 0.82</td>
<td>90.89 ± 0.59</td>
<td>90.31 ± 0.66</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Albumin weight (%)</td>
<td>37.84 ± 1.79</td>
<td>44.71 ± 5.12</td>
<td>44.99 ± 3.24</td>
<td>45.31 ± 1.1</td>
<td>39.82 ± 1.78</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Egg Shell Thickness (mm)</td>
<td>0.14 ± 0.01</td>
<td>0.17 ± 0.01</td>
<td>0.18 ± 0.01</td>
<td>0.26 ± 0.01</td>
<td>0.26 ± 0.01</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Shell weight (%)</td>
<td>10.58 ± 0.22</td>
<td>13.78 ± 0.76</td>
<td>11.26 ± 0.44</td>
<td>11.72 ± 0.35</td>
<td>12.49 ± 0.64</td>
</tr>
<tr>
<td></td>
<td>c</td>
<td>a</td>
<td>bc</td>
<td>bc</td>
<td>ab</td>
</tr>
</tbody>
</table>

Values followed with the same letters are not significantly different from each other according to Duncan’s Multiple Range test at (5%) level.

1 LMCM : local mineral clay meqdadia
T1: control, T2, T3, T4 and T5: adding 0.5%, 1%, 1.5% and 2% of LMCM respectively

Table 5 shown the effect of adding LMCM in the diets of female Japanese quail upon percentage weight of carcass parts (%).

Table 5. effect of adding LMCM\(^1\) in the diets of female Japanese quail upon percentage weight of carcass parts (mean ± SE)

<table>
<thead>
<tr>
<th>Treatment Traits</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcass (%)</td>
<td>68.45 ± 0.4</td>
<td>69.26 ± 1.00</td>
<td>68.65 ± 1.14</td>
<td>68.29 ± 1.64</td>
<td>70.23 ± 1.71</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Wings (%)</td>
<td>9.57 ± 0.18</td>
<td>10.06 ± 0.9</td>
<td>9.06 ± 0.36</td>
<td>8.56 ± 0.11</td>
<td>9.65 ± 0.6</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Chest (%)</td>
<td>37.93 ± 0.92</td>
<td>39.38 ± 2.03</td>
<td>34.7 ± 1.43</td>
<td>39.65 ± 0.8</td>
<td>41.18 ± 1.36</td>
</tr>
<tr>
<td></td>
<td>ab</td>
<td>a</td>
<td>b</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>Legs (%)</td>
<td>20.57 ± 0.15</td>
<td>18.49 ± 0.24</td>
<td>20.97 ± 0.4</td>
<td>21.58 ± 0.33</td>
<td>22.15 ± 0.56</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>c</td>
<td>b</td>
<td>ab</td>
<td>a</td>
</tr>
<tr>
<td>Backness (%)</td>
<td>31.33 ± 0.93</td>
<td>30.68 ± 1.12</td>
<td>34.41 ± 2.3</td>
<td>31.4 ± 0.9</td>
<td>26.45 ± 1.23</td>
</tr>
<tr>
<td></td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>b</td>
</tr>
</tbody>
</table>

Values followed with the same letters are not significantly different from each other according to Duncan’s Multiple Range test at (5%) level.

\(^1\) LMCM: local mineral clay meqdadia

T1: control, T2, T3, T4 and T5: adding 0.5%, 1%, 1.5% and 2% of LMCM respectively

Observed from table above chest percentage (%) tended to be significantly (p≤0.05) lower in T3 (adding 1% of LMCM) compared with T2, T4 and T5, while Legs percentage (%) tended to be significantly (p≤0.05) higher in T5 (adding 2% of LMCM) compared with T1, T2 and T3. Carcass (%), Wings (%), Backness (%) were not significantly influenced by adding LMCM to the dietary treatment.

**Conclusion**

Based on the research results, supplementing mineral clay (Meqdadia) caused significantly improvement only in Egg shell thickness (mm) and shell weight (%) traits of the Female Japanese quail eggs.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required.

**References**


Detection of Risk Factors of Human and Birds that Related to Influenza Type A (H1N1) pdm09 Infection

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1Department of Public Health, College of Veterinary Medicine, Al-Basra University, Basra, Iraq. 2Department of Pathology and Poultry Diseases. 3Department of Microbiology, 4Zoonotic Diseases Unit, College of Veterinary Medicine, Al-Qadisiyah University, Al-Qadisiyah, Iraq

Abstract

Background: Influenza is a worldwide zoonotic disease caused by Orthomyxoviridae virus. The appearance in humans of the A (H1N1) pdm09 influenza virus, a complex reclassified virus of swine origin, highlighted the importance of worldwide influenza virus surveillance in birds. To date, wide-control surveillance studies have been reported for Asia and North America, but such deep data have not yet been described in Iraq.

Material and Method: One hundred forty-five (145), human samples used in the study were collected from General Teaching Hospital and Specialized Hospital Maternity and Children Teaching Hospital and Center Pulmonology and Respiratory Specialist in Al-Diwaniyah city following the WHO (15) influenza-like illness case definitions. A total of 145 clinical samples (throat swabs and nasopharyngeal swabs [73], bronchial lavage [72]) collected in December 2015 to January 2016 (2 Months period) and evaluated for the presence of influenza A (H1N1). Chicken tracheal swabs were (113) Sample) from different broiler flocks in Al-Diwaniya. All samples tested directly by using taq man Real Time- PCR technique.

Results: showed that the infection incidence with influenza A(H1N1) pdm09 in humans (18%) and in broiler (65.48%), the study proved that there was a significant difference at the site of infection in the respiratory tract (URT& LRT) for humans, as well as in terms of age groups.

Conclusions: Influenza is a highly potential zoonotic circulating disease between peoples in Al-Diwaniyah city and clearly defined risk groups: people with respiratory infection, heart and vascular disease, immunosuppressed patients and distributed in chicken in broiler flocks that have respiratory disorder. Real Time –PCR is a potential tool in diagnosis of A(H1N1) pdm09 virus between human and chicken

Keyword: A(H1N1) pdm09, human, broiler, Taman real time-PCR, respiratory diseases, & Iraq.

Introduction

Newly emerged swine origin A H1N1 pandemic consider the cause of a populations worldwide issue started in early 2009 and identified between humans in Mexico, United States (US), with a significant impact on public health reached annually to 15-20% in the world population1. Of belief it has been derivative from the 1918 influenza pandemic3.

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Globally, influenza A(H1N1) virus distribution was appreciated to be higher than that of seasonal influenza viruses3. Out of the three types of influenza viruses (A, B, and C), Influenza A virus is a zoonotic and infection has been recorded in a variety of mammalian and avian species. Mainly waterfowl such as ducks and geese are considered the natural reservoir of many influenza A viruses4,5. Genetically, fourfold re-assortment of an influenza A virus include two swine strains, one human strain, and one avian strain, which could be remixed through pigs as an intermediate host of mammalian. About one half of the genetic component is originated from swine, somewhat less than one fifth arises from human, and one third is of avian origin6.
Influenza is a well-known cause of acute respiratory disease in different hosts and spreads by aerosol transport but also can spread via fomites. In human symptoms include bronchiolitis, pneumonia, febrile disease, cough, sore throat, headache, myalgias, chills, and fatigue; gastrointestinal symptoms have also recorded. While most influenza viruses cause in poultry high pathogenic forms or asymptomatic mild infection, however almost reported isolates are of low pathogenicity in chickens and turkeys birds vary based on molecular characteristics of the virus and the ability of the virus to cause disease and mortality in chickens in a laboratory setting.

In Iraq, June 2009 the first infection confirmation with pandemic influenza has been announced by Iraqi health ministration, precisely, in Erbil province northern Iraq H5N1 was found, in Sulymanyia the infection confirmed by fatal human case, highly pathogenic H5N1 in poultry were recorded too. While H1N1 caused epidemic during 2009 and 2013. During 2013 outbreak appeared between peoples in eleven central and south Iraq governorates (Baghdad, Babylon, Diyala, Wasit and Anbar (Najaf, Qadisiyah, Maysan, Muthanna, Dhi Qar and Basrah) and in another survey (13%) of children under 5 years old were infected with influenza virus type A.

Materials and method

The study was collected from General Teaching Hospital and Specialized Hospital Maternity and Children Teaching Hospital and Center Pulmonology and Respiratory Specialist in Al-Diwaniyah city following the WHO influenza- like illness case definitions. A total of 145 clinical samples (throat swabs and nasopharyngeal swabs) collected in December 2015 to January 2016 (2 Months period) and evaluated for the presence of influenza A (H1N1). Most patients have been showed (sore throat, cough, rhinorrhea, wheezing chest, fever between 3-7 days while temperature of 38-39°C, chills, runny or stuffy nose, bronchial breathing, muscle or body aches, headache, fatigue, sometimes associated with vomiting and diarrhea. The cases were defined with physical examination by the consultant physicians, chest X ray and signed. Dacron throat swab specimens were collected under proper sterile precaution, submerged in 3.0 ml viral transport media, and immediately transported to Laboratory Biogenic techniques in an iced carrier box. As per the laboratory criteria for diagnosis the samples, use of appropriate biosafety measures and personal protection equipment (PPE) in dealing with samples. The swabs freeze at -70 °C, until used for viral genomic RNA extraction. 113 samples were collected from different infected broiler flocks most of them were expressed severe respiratory signs (ocular and nasal discharge, gasping, grossly there were severe congestion of trachea, cast plug in the bifurcation of the trachea, affected swollen pale kidneys), with moderate mortality rate. Tracheal swabs were collected from 5 chickens per flocks by using sterile cotton swab for rapid detection of influenza virus. Tissue samples of trachea, lung, kidney and cecal tonsils were collected in sterile plastic test tubes and stored in deep freeze at (-42°C) in Dewanyia veterinary hospital until used for qRT-PCR.

Viral RNA extraction: The extraction of viral RNA from nasopharyngeal secretions specimens by using (AccuZolTM RNA extraction kit Bioneer. Korea). A 250µl nasopharyngeal sample was placed in 1.5ml microcentrifuge tube, and then 1m trizol reagent was added and mixed well by vortex for one minute. After that, 200µl chloroform was added and mixed vigorously for 15 seconds, and then the mixture incubated on ice for 5 minutes. The tubes placed in cold centrifuge 4°C at 12000 rpm for 15 minutes. The supernatant was transferred to a new microcentrifuge tube, and 500µl isopropanol was added and the mixture mixed by inverting the tube 4-5 times and incubated at 4°C for 10 minutes. The tubes back to centrifuge at 12000 rpm for 10 minutes, and then supernatant was discarded. The RNA pellet was washed by added 1ml 80% Ethanol with DEPC and mixed again, then placed in centrifuge at 12000 rpm for 5 minutes. After that, the supernatant was discarded and the RNA pellet left to air dry. Finally 50µl DEPC water added to elution of RNA pellet, and then the extracted RNA sample was checked by Nanodrop spectrophotometer and store in -20°C freezer until used in RT-PCR assay. Reverser Transcription Real-Time PCR : RT-qPCR technique was performed for rapid detection of Influenza A virus H1N1 virus according to method described by (11). Real-Time PCR primers and probe were designed in this study by using conserved region in hemagglutinin (HA) gene in influenza virus A /Florida/62/2014(H1N1) lineage A(H1N1)pdm09 (NCBI-GenBank Code: KT836512.1) with an amplicon size of 102bp. These primers and probe were provided by Bioneer Company. Korea HA primer (H1N1) F AAAGGTGTAACGCGCAGCATG,
R TGGGTAGATCGTGGTATG / HA probe (H1N1) FAM-CCTCACGCTGGGGCAAAAGC-BHQ1. The Reveres Transcription Real-Time PCR amplification reaction was done by using one step reaction kit (AccuPower™ Dual star RT-qPCR master mix kit, Bioneer, Korea) and the qPCR master mix were prepared for each sample according to company instruction 5μL of RNA template, 1μL of NA Forward primer (10pmol), 1μL of NA Reverse primer (10pmol), and 12.5μL DEPC water to reach total volume 20μL. These qPCR master mix reaction components that mentioned previously were added into standard RT-qPCR premix tube which contain (RocketScript reverse transcriptase enzyme, DNA polymerase, dNTPs, and 10X buffer). sterile white RT-qPCR strip tubes and transferred into Exispin vortex centrifuge for 3minutes, and placed in MiniOpticon Real-Time PCR system and applied the following thermocycler conditions: RT step 50 °C for 1hour 1cycle, Initial Denaturation 95 °C for 3min 1cycle, [ Denaturation 95 °C for 10 sec, Annealing\ Extension 56.7 °C 30 sec, Detection(scan)] 45 repeated cycles.

**Result & Discussion**

This study deals with an important theme & clearly illustrates of some significant epidemiological features of influenza A H1N1 in infected patients and poultry. From all 145 patients suspected cases, 18(12.16%) were positive to H1N1 virus while, out of 113 poultry tested swabs there were 74(65.48%) highly positive incidence (table 1), the assay results confirmed the specify for subtype A (H1N1), while the sensitivity reached 100 copies/reaction, it is top of the convential RT-PCR (figure 1, 2). Most patients suffered from dyspnea, bone pain, fever, myalgia, and sore throat. This clinical symptoms of Influenza, came in agreement with the records of13,14 whereas predominantly infected broiler-breeder chicken with LP influenza virus showed mild respiratory signs gasping, dyspnea, coughing, nasal discharge, our finding is consistent with18,19 which experimentally existence of A (H1N1)pdm09 infection between chickens, turkey breeder flocks and ducks in the United Kingdom.

<table>
<thead>
<tr>
<th>broiler flock</th>
<th>No of samples</th>
<th>No of positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>74</td>
</tr>
</tbody>
</table>

**Table 1** positive numbers of influenza virus type A(H1N1) pdm09 distribution in breeder flocks

![Fig. 1: Real-Time PCR amplification plots for hemagglutinin (HA) gene in Influenza A virus H1N1, positive samples.](image-url)
Fig 2: Agarose gel electrophoresis image that show the Real-Time PCR product analysis of hemagglutinin (HA) gene in Influenza A virus H1N1. Where M: marker (2000-100bp), lane positive samples from infected human and birds at (102bp) qPCR product.

The overall number of H1N1 positive predominant males was higher than females patients (13.25% and 11.29%, respectively) table (2), in different age groups the nature of Iraqi society make men responsible of family finance performance with greater mobility this causes have close portability to increased males infection more than females and this results closed enough to (20).

Table (2) positivity rate of A (H1N1) infections according to genders

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of respiratory samples</th>
<th>No. of positive respiratory samples</th>
<th>Positivity Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>83</td>
<td>11</td>
<td>13.25A</td>
</tr>
<tr>
<td>Female</td>
<td>62</td>
<td>7</td>
<td>11.29A</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>18</td>
<td>12.16</td>
</tr>
</tbody>
</table>

significant differences at (P<0.05)

The highest incidence of infection in patients were observed in the age group of 45-60yr (25%), 1-6yr (6%) respectively table(3), the results agreed with 13,20,21 estimated that this age group represented by movable populations, they travelling for different reasons and more in touch with illness people, smoking habit and chronic respiratory diseases which is skewed toward older ages whereas A(H1N1) virus disappeared between infants because there is no previous exposing to infection and there is considerable evidence that infants influenza infection generally more common among those aged 6 to 12 months than in the first 6 months of life, because of granted protection from maternal influenza antibodies acquired through lactation period or transplacentally, this part of result explained by 22.

Table (3) positivity rate of A (H1N1) infections according to age groups

<table>
<thead>
<tr>
<th>Ages groups</th>
<th>No. of respiratory samples</th>
<th>No. of positive respiratory samples</th>
<th>Positivity Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6 months</td>
<td>60</td>
<td>15</td>
<td>25A</td>
</tr>
<tr>
<td>1-6 years</td>
<td>50</td>
<td>3</td>
<td>6B</td>
</tr>
<tr>
<td>45-60 years</td>
<td>35</td>
<td>zero</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>18</td>
<td>12.16</td>
</tr>
</tbody>
</table>

significant differences at (P<0.05)

Sage distribution of Influenza A (H1N1) test positive cases in urban 8.57% and rural areas 16% (12/75), respectively. Different risk factors between and within urban peoples clarified by policy on social dimensions, decrease vaccination, diagnosis of patients, low health awareness, mixed living with farm animals and they are more susceptible to wild animals and migratory birds population 23. Table (4).
Table (4) positivity rate of A (H1N1) infections according to regions

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of respiratory samples</th>
<th>No. of positive respiratory samples</th>
<th>Positivity Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>City center</td>
<td>70</td>
<td>6</td>
<td>8.57A</td>
</tr>
<tr>
<td>Rural areas</td>
<td>75</td>
<td>12</td>
<td>16A</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>18</td>
<td>12.16</td>
</tr>
</tbody>
</table>

significant differences at (P<0.05)

According to the targeted site of infection there was a significant difference between URT infection 19% (14/73) and LRT 5.55% (4/72) respectively. Respiratory viruses are a cause of upper respiratory tract infections (URTI), but can be associated with severe lower respiratory tract infections (LRTI) in immunocompromised patients. The result mismatching with which clarified that influenza viruses are common causes of infection in lower respiratory tract, generally influenza viruses a self-limiting infection with systemic and respiratory symptoms, usually resolving within 3 to 6 days in most patients. Table (5).

Table (5) positivity rate of A (H1N1) according to infection sites.

<table>
<thead>
<tr>
<th>Site of infection</th>
<th>No. of respiratory samples</th>
<th>No. of positive respiratory samples</th>
<th>Positivity Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper R. T.</td>
<td>73</td>
<td>14</td>
<td>19.17</td>
</tr>
<tr>
<td>Lower R. T.</td>
<td>72</td>
<td>4</td>
<td>5.55B</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>18</td>
<td>12.16</td>
</tr>
</tbody>
</table>

significant differences at (P<0.05)

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the Faculty Scientific Committee (1Department of Public Health, College of Veterinary Medicine, Al-Basra University, Basra, Iraq) to detection of risk factors of human and birds that related to influenza type A (H1N1) pdm09 infection

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Risk Assessment in the Laboratory of Epidemiology

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Abstract

Background and Objectives: Risk management is an endeavor in managing risks in the field of Occupational Safety and Health to halt the occurrence of unwanted occupational accidents comprehensively, planned, and structured in a well-managed system. The incidence of occupational accidents are likely to be found in many workplaces, and one of those is in a laboratory. The Laboratory of Epidemiology in the Faculty of Public Health, Universitas Airlangga is a site for students to conduct numerous activities, such as experiments, research, and tests and/or calibration. Those activities are supposed to be containing potential hazards, namely fingers injuries caused by laboratory equipment, eye fatigue, and Musculoskeletal Disorders (MSDs). Method: This research aims to identify the hazards and attempts to perform risk assessments by implementing HIRADC method in a laboratory in the Faculty of Public Health Universitas Airlangga to prevent the occurrence of occupational accidents and occupational illnesses suffered by the laboratory users. This research is descriptive research. The data are collected by conducting a direct observation and interviews with the laboratory workers. The variables in this research are hazard identification, risk assessment, and risk control. Results: By implementing the HIRADC method, the results show that there are 12 risks discovered, namely 10 low-risk level of hazards and 2 moderate-risk levels of hazards. Amongst the proposed risk controls are the use of standardized Personal Protective Equipment (PPE), the music playback to reduce stress levels, and the addition of seat cushions to minimize the complaints of MSDs. Therefore, the mentioned controls and recommendations are expected to facilitate the attempt to reduce the risk level occurrences in the Laboratory of Epidemiology in the Faculty of Public Health, Universitas Airlangga.

Keywords: HIRADC, occupational safety and health, laboratories, risks

Introduction

Referring to the Government Regulation Number 50 of 2012, Occupational Safety and Health is any action to ensure and protect the safety and health of the manpower by preventing occupational accidents and occupational illnesses.⁴ According to Widodo (2015), Occupational Safety and Health is a field that is related to health, safety, and welfare of those who work in an institution or a site project.⁵ The prevention of occupational accidents in Indonesia can be done by implementing the Occupational Safety and Health Management System.

Risk management is an endeavor to manage risks in the field of occupational safety and health to prevent the happening of unwanted occupational accidents comprehensively, planned, and structured in a well-managed system (Ramli, 2010). In accordance with OHSAS 18001, a risk can be described into a combination between the possibility of danger or exposure and the severity of injuries or health problems as a result of the exposure. Meanwhile, risk management itself is outlined as a process to manage risks that are likely to exist in every activity (Ramli, 2010).

Risk management is an endeavor to manage risks in the field of occupational safety and health to prevent the happening of unwanted occupational accidents comprehensively, planned, and structured in a well-managed system (Ramli, 2010). In facilitating the implementation of risk management, several methods
are fundamental to be carried out, and one of those is HIRADC. HIRADC, which stands for Hazard Identification, Risk Assessment, and Determinant Control, is a sequence of the process to identify potentially occurring hazards in every routine and non-routine activity. Then, the risk assessment is formulated based on the hazard identification before the assessor developing a hazard control program with the intention to minimize the risk level to prevent any possible accident.

During the operation of HIRADC, there are three steps to be completed, starting from determining the type of work, identifying hazard sources, to obtaining the risks. After that, the risk assessment and risk control to decrease hazard exposures contained in every occupation are to be reported. The assessment of the identified potential hazards through analysis and evaluation is carried out to determine the level of risks by considering every possibility and the consequences it may cause. Then, from the results of the analysis, the risk assessment can be categorized from low-risk level until high-risk level. The results of risk analysis are then evaluated and compared to the specified criteria or to the applied standards and norms to resolve the risk level, which later can be prevented in order to minimize the risks of occupational accidents.

Occupational accidents are likely to be discovered in any workplace, and one of those is in a laboratory. A laboratory is a site to conduct any activity, for example, experiments, research, and tests and/or calibrations. Inasmuch as many people are involved in every activity conducted in a laboratory, the risks of occupational hazards may also involve a quite big number of people. Thus, every person who performs activities in a laboratory must have familiarity with occupational safety and health in a laboratory. The issues of occupational safety and health in a laboratory are given quite an attention that is in accordance with the practice of education, research, and analysis. Due to that reason, the presentation of clear, detailed, and thorough information regarding the hazards in a laboratory as well as the attempt to provide occupational safety in a laboratory are indeed indispensable.

**Material and Method**

This research applied the descriptive method. According to Nurbuko (2005), the descriptive method is a method that can portray clear pictures of an issue and a condition based on the factual data that it is merely the obtained fact and data elaboration. As for the data collection, the method used was field observation and document analysis by implementing HIRADC method. The data analysis was carried out by identifying hazards and assessing risks along with the controls, followed by risk level analysis to figure out the risk level of each discovered hazard.

**Findings**

The data analysis was completed by enforcing the HIRADC method that consists of hazard identification, risk assessment, and risk control.

**Hazard Identification**

The hazard identification process is the following process of activity identification. In the hazard identification process, the risks of every identified activity are elaborated. As for the activities performed in the laboratory are the experiment process and laboratory equipment and computer preparation and resolution. During the experiment activity, the most-occurred incidence arises from the treatment to the laboratory equipment. Such incidence usually occurs due to the lack of human attention during the experiment. Other than that, the lack of familiarity of the standard operational procedures resulting in work negligence. The hazard identification process in the laboratory is obtained by conducting a field observation as well as a consultation with the laboratory workers.

**Risk Assessment**

The identified potential hazard assessment consists of analyzing and evaluating hazard risks to determine the consequences followed is carried out by considering any possibility and the effect of the occurrences. The mentioned risk assessment includes risk analysis and risk evaluation. The variables used in the risk assessment are Likelihood and Severity. Likelihood is the probability of occupational accidents occurrence, while Severity refers to the severity level of occupational accidents. Likelihood variable is used to determine the number of activities that cause occupational accidents. On the other hand, Severity portrays the severity level of an occupational accident. The elucidations of the risk assessment are drawn in the table below.
From the results of the risk assessment, it can be noticed that there are 12 discovered hazard risks in the laboratory. The risk assessment is aspired to arrange the priority handling of the identified hazards. Conferring to the data that have been presented beforehand, there are only two hazards which get the priority handling, namely the hazard of fingers injuries when preparing and resolution laboratory equipment as well as the hazard of electric shock when turning on the computer. Thus, for that reason, the control performed must be initiated from the ones with the highest risk level to the lowest ones.

**Risk Control**

The risk control is objectified to minimize the risk level by handling the existing hazards. The table below shows the risk control of the hazards discovered in the laboratory.

The attempts to decrease the risk levels are as follow as for the electric shock hazards, when turning on the computer, the control can be done by wearing Personal Protective Equipment, such as leather gloves. This is in accordance with the Law Number 1 of 1970 article 13 on the Occupational Safety, namely the obligations when entering workplaces, and the Minister of Labor Regulation 03/MEN/1998 on the Procedures for Reporting and Checking Accidents as well as the regulation-standard installation of the electricity. As mentioned in the Minister of Labor Regulation 75/MEN/2002 on the Enactment of Indonesian National Standards number 04-0225-2000 on the General Regulation of the Installation of Electricity 2000 (PUIL 2000) and formulating installation instructions or any installation in workplaces.

As for the fire hazards, the risk control can be performed by the procurement of fire extinguishers. This is in correspondence with the Law Number 1 of 1970 on the Occupational Safety, the Minister of Labor Regulation Number 04/MEN/1980 on the Provision of Installing and Maintaining fire extinguishers, and Government Decision 186/MEN/1999 on the Fire Prevention Unit in workplaces.

As for the psychological hazard, for instance, stress, the control is operated by the music playback during working hours to create a more convenient working environment. As for the irritation hazards caused by the dust and the radiation from the computer screen as well as the irritation as a result from the heat, the control is carried out by wearing Personal Protective Equipment, for example, gloves and goggles. This refers to the Law Number 1 of 1970 article 13 on Occupational Safety, namely the obligations when entering workplaces.

As for the injury hazards resulting from the scratch and broken laboratory equipment, the control is to be enforced by wearing Personal Protective Equipment, such as gloves and goggles as well as by putting on
coverall and safety shoes to protect the feet. This control is pointed out from the Minister of Labor Regulation Number 187/MEN/1999 on the Diagnosis and the Reports of Occupational Illnesses.10

As for the MSDs hazards due to the non-cushioned seats, the control can be executed by adding several cushions to the seats. As for the diseases transmitting hazards generated from the experiment in the laboratory, the control is to be done by wearing Personal Protective Equipment, for instance, masks, gloves, and goggles.

Conclusions

Based on the results obtained from the research conducted by implementing HIRADC method, it can be inferred that there are 12 hazards that consist of 10 low-risk level hazards and 2 moderate-risk level hazards.

Amongst the proposed risk controls are the wearing of standardized Personal Protective Equipment, the music playback during working hours to reduce the stress level, and the procurement of seat cushions to minimize the complaints of MSDs. Therefore, the suggested controls and recommendations are highly expected to support the endeavor in reducing the risk levels that are likely to be discovered in the laboratory.

Ethical Clearance: Taken fromm Faculty of Public Health Airlangga University Commitee

Fundings: Sponsored by University.

Conflicts of Interest: Nil

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Effectiveness of An In-Service Education Program on Knowledge and Practices Regarding Biomedical Waste Management among Staff Nurses

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Abstract

“Biomedical waste” is defined as any type of waste, produced during the diagnosis, management or vaccination of human beings, animals or during research which is related to or in the production or testing of livings¹. The purpose of this study was to assess the effectiveness of in-service education programme on knowledge and practice regarding biomedical waste management among staff nurses. A quasi experimental approach with pretest posttest design was implemented among 30 staff nurses using a simple random sampling technique. At pretest a structured practice checklist was used to assess the existing practices of handling, collection, segregation and storage as well as disposal of biomedical waste and a structured knowledge questionnaire was administered to the staff nurses respectively to assess the knowledge in the areas of handling, collection, segregation and storage as well as disposal of biomedical waste was assessed. The posttest findings of an in-service education program on biomedical waste management among staff nurses indicate that it highly served to improve the knowledge and practices.

Keywords: In Service Education, Biomedical Waste Management, Staff nurses

Introduction

Hospital related wastes are infectious as well as hazardous. It causes serious risk and health impact on the environment and it necessities the need of safe disposal methods². Due to mushrooming of hospitals, nursing homes, clinics and diagnostic laboratories a mounting amount of waste is generated³. Appropriate waste management systems have been developed and installed globally to handle both hazardous and non-hazardous biomedical waste⁴.

The government of India responded to global concern and enforced the biomedical waste management and handling rules in 1998, which is applicable to hospitals, nursing homes, veterinary institutions and animal shelters that generate biomedical waste. The Ministry of Environment and Forest had published the, “Biomedical waste management and handling rules 1998/ 2000 under the Environment protection act, 1986 that compel all hospitals, clinics, nursing homes, slaughter houses and laboratories to ensure a safe and environmentally sound management of waste produced to protect the environment and community health⁵.

Bio medical waste management rules, 2016 classifies biomedical waste into four categories based on their separation and color code. The color coding follows the mandated categories 1. Yellow, 2. Red, 3. White and 4. Blue. The yellow biomedical waste disposal containers have been further subcategorized from “a” to “h”. All the yellow category waste are finally incinerated or deeply buried. The Red category stores contaminated waste which is recyclable. The Blue category stores glassware and metallic body implants whereas the white

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category is used to segregate waste which are sharp objects including metals\(^1\).

It is required to provide a safe working environment for all health care providers which include nurses\(^5\). Thus this study aims to evaluate the relationship between knowledge and practice of biomedical waste among nurses.

**Aims of the study**

The aims of the study were divided into two phases. Phase -1, evaluated the existing practice regarding biomedical waste management among staff nurses using a structured practice checklist, and followed by assessment of knowledge of staff nurses on biomedical waste management utilizing a questionnaire. Phase -2, evaluated the effectiveness of an in-service education programme on biomedical waste management among staff nurses.

**Material and Method**

A quasi experimental approach was employed for the study. 30 staff nurses who met the inclusion criteria (Staff nurses willing to participate in the study and present in the hospital during data collection, Staff nurses with full time employment status, Staff nurses with total years of clinical experience of not less than 2 years) was chosen using simple random sampling technique. Every participant signed a written informed consent as agreement to participate and to maintain confidentiality of identity. A structured practice checklist was prepared for assessing the existing practices of handling, collection, storage and segregation as well as disposal. The tool was found to be reliable with reliability co-efficient \((r = 0.93)\). Structured knowledge questionnaire was administered to the staff nurse with maximum score was 26. Section A, had 6 items regarding handling. Section B, consisted of 7 items regarding collection. Section C, had 6 items regarding storage and segregation. Section D, had 7 items regarding disposal. Descriptive and inferential statistics was used for data analysis.

**Findings**

Majority of the sample (56.7\%) belonged to the age group 25-35 years, and 33\% had working experience of 10-15 years. The existing level of practice showed that more than 55\% of the staff nurses were in the fair practice category. Post-test scores on practice were significantly higher than pre-test practices scores which had majority of the nurses under good and very good category as illustrated in (Fig. 1). An assessment of pre-test knowledge showed that (56.7\%) nurses had average knowledge and (43.3\%) had poor knowledge regarding biomedical waste management. Post-test assessment showed that majority of the staff nurses (53.3\%) had acquired good knowledge and (36.7\%) had acquired very good knowledge as depicted in (Fig. 2). The mean of the post-test (20.63) knowledge scores was higher than the mean of pre-test (11.30) knowledge scores as demonstrated in (Table.2). Data revealed statistically significant difference between pre-test and post-test knowledge scores \((t_{(29)}=13.68, p<0.05)\). The maximum percentage gain after in service education occurred in the area of handling, followed by collection, then in the area of storage and segregation of waste and the lowest percentage gain was recorded in the area of disposal as shown in (Figure 3).

<table>
<thead>
<tr>
<th>Frequency and percentage distribution of pre-test and post-test practice scores</th>
<th>Pre-test practice scores</th>
<th>Post-test practice scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Percentage</td>
<td>Frequency</td>
</tr>
<tr>
<td>Poor</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Fair</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Good</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Very good</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 1:** Frequency and percentage distribution of pre-test and post-test practice scores of staff nurses on biomedical waste management.
Table 2: Mean, mean percentage and standard deviation of pre-test and post-test knowledge scores of staff nurses on biomedical waste management.

<table>
<thead>
<tr>
<th>Knowledge scores</th>
<th>Mean</th>
<th>Mean %</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test knowledge score</td>
<td>11.30</td>
<td>46.43</td>
<td>2.307</td>
</tr>
<tr>
<td>Post-test knowledge score</td>
<td>20.63</td>
<td>79.44</td>
<td>4.214</td>
</tr>
</tbody>
</table>

Table 3: Area wise mean percentage distribution of pre-test and post-test knowledge score of staff nurses on biomedical waste management.

<table>
<thead>
<tr>
<th>Area</th>
<th>Pre-test knowledge score</th>
<th>Post-test knowledge score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean %</td>
<td>Mean %</td>
</tr>
<tr>
<td>Handling</td>
<td>52.11</td>
<td>83.33</td>
</tr>
<tr>
<td>Collection</td>
<td>44.95</td>
<td>79.05</td>
</tr>
<tr>
<td>Storage and Segregation and Disposal</td>
<td>39.00</td>
<td>77.78</td>
</tr>
<tr>
<td>Disposal</td>
<td>49.67</td>
<td>77.62</td>
</tr>
</tbody>
</table>

Conclusions

This study findings show that an in-service education program on biomedical waste management among staff nurses is very effective in improving the knowledge and practices.

Regular and ongoing training program on biomedical waste management its regulation and hospital policy regarding disposal should be insisted giving special consideration for the newly joined staff. The Central pollution Control Board, the Ministry of Environment & Forests has recommended that there should be a course on biomedical waste management in under graduate nursing curriculum.

The study is limited to small number of participants. The following recommendations are made based on the present study for future study; similar study may be conducted on a larger sample.

To fulfill the Biomedical Waste Management and handling Rules and to safeguard health of health team professional they should be equipped with proper education of safe handling, collection, segregation approaches storage, treatment and disposal of biomedical waste. This study was found to be effective in improving knowledge and practices in nursing staff.

Conflict of Interests: The authors declare that they have no conflict of interests with any organization regarding the materials discussed in this manuscript.

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Ethical Clearance: Ethical clearance was obtained from the Research Ethical committee Alva’s college of nursing Moodbidri.

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The Impact of Qualitative Exercises in the Development of Some Aspects of Attention to the Boxers National Center for the Care of Sports Talent

Khalil Ibrahim Al-Hadithi, Anmar Fawzi Jasim Albufahad

Abstract

That there are differences in the performance of some players compared to the standard within the Center’s plan, which led the researcher to study this problem and develop the right solutions to reach the performance of skilled through the design of specific exercises aimed at the capabilities of players and their impact in the development of some aspects of attention. In developing some aspects of attention to the National Center for the Advancement of Sports Athletics in Boxing.

The sample of the research consisted of (24) males representing (80%) after excluding the remaining boxers who participated in the pilot experiment (6) boxers distributed according to weights except heavy weight, as each weight included two boxers or four boxers distributed by lottery. After collecting the data, the data were analyzed statistically and obtained the results through which the most important conclusions were reached, including: The specific exercises have a positive effect on the development of some aspects of attention to the people of the National Center for Sports Boxing.

Keywords: Qualitative exercises, attention and boxers.

Introduction

The importance of research in the selection of educational experiences (specific exercises) and formulation in dynamic sentences that fit with the special requirements of the performance of skills and the potential of the boxer at the age of (14-15) years are the independent variables that we expect positive change in the variables dependent (focus attention). As a result of the boxer’s passing of these experiences and his interaction in performing these specific exercises. Thus, the boxer can be capable of self-defense and attack because he needs skill alongside punches and intelligence in attack and defense, so it is a sport where art triumphs over power.

One of the most important aspects of attention is the concentration of attention and means the readiness of the athlete to direct mental activity towards a specific goal and the extent of response is an important means to raise the level of the player and ability to observe things clearly and high accuracy of concentration and enables the player to distract distraction and focus on the main points in the performance universe. The focus is good performance. “If attention is a general concept, the focus is a core,” and Yahya Kazem (1990) sees it as “narrowing attention to a certain emotion or keeping an eye on a particular emotion.”

But it is an integrated sport that builds the character of the individual and returns to the endurance, self-reliance, speed of knowingness, behavior, courage and courage, as well as gaining high physical fitness and self-confidence. Boxing cannot be used outside the competition for aggression against people, the boxer does not infringe on anyone and does not hurt anyone with his art and skills.

Research aim:

Identify the impact of specific exercises in developing some aspects of attention to the people of the National Center for Sports Boxing.

Research methodology and field procedures:
Research Methodology

The researcher used the experimental method to suit the nature of the research problem with the design of the two parallel groups with pre and post-test.

Search community and sample:

The research community was identified as the founding members of the National Center for the Advancement of Athletics in Boxing (30), which represents the society of origin for the year 2018-2019. The research sample consisted of (24) males representing (80%) after excluding the remaining boxers participating in the experiment (6) boxers distributed according to weights except heavy weight as each weight included two boxers or four boxers distributed by lottery to two groups.

Specify search variables:

Exercises designed (quality):

In the light of the researcher’s knowledge of Arab and foreign sources as well as the training of the National Center for the care of sports talent for young people, the exercises were prepared on the basis of scientific aims to identify the weaknesses of the large and identified through the video analysis, which the researcher photographed and presented to specialized experts, Exercise and after the presentation to the experts have been deleted and modified some exercises to become (27) exercise. Examples of exercises that have been modified is a matching exercise that was a wheel frame diameter of 60 cm from the inside and put the two boxers front feet (leader) within the framework and performance skills Offensive and defensive To become a drawing after the adjustment ring on the ground that the fact that the colored or tape players from the emerging category and height is not sufficient and that the height of the frame approximately (25 cm). This is opposed to the movement of their feet while performing the exercise.

Specification of the tests used in the search:

First: the test of measuring the attention of the boxers:

Purpose of the test: Measure the attention of boxers

Tools used: Boxing gloves, electrical connections, registration form the machine consists of a board made of wood measuring (60 × 60) cm coated with sponge thickness (5) cm and the outside is encased in a piece of white leather, as there are inside the board electric lamps number (7) in different colors (yellow - red - blue - Green) are distributed in four directions. These lamps are connected to a (5 meter) long cable connected to an electronic base and its room. Recording the results by electronic display, control of lamps, instructions and timing. It contains 30 different programs for running lamps so that the laboratory cannot keep the test. The test has the duration of the test (convert now (40) second is divided into four colors for each color (10) seconds, and the duration of the light is half a second.

Performance: The boxer stands in front of the light pad in the standby mode. The test begins with a signal from the device (three consecutive flashes). At the start, the laboratory will only perform a yellow color punch for 10 seconds. After that, the switch will be red for 10 seconds. The lab is converted to blue for 10 seconds. At the end of the test, the laboratory turns green until the end of the test and the conversion is according to the instructions issued by the device. It is an electronic siren connected to the device.

Method of recording: The number of lamps extinguished by the laboratory is recorded for 40 seconds (total four color timing).

Second: Measuring the attention of boxers:

Purpose of the test: To measure the concentration of attention among boxers.

Tools used: gloves, electrical connections, registration form.

Specification of the device: The machine consists of a board made of wood (60 × 60) cm and thickness (30) cm sponge coated with thickness (5) and outside (7) in different colors (yellow, red, blue, green) distributed on four directions where they relate (30) different program to restart the lamps so that the laboratory cannot keep the test and the duration of the concentration test is (15) Second, the lamp’s life time is half a second.

Method of performance: The laboratory stands in the standby mode and, when hearing the electronic instructions issued by the apparatus, the laboratory performs the tests as quickly as possible the red color the
player will focus on. It is among the other colors where the other colors are not counted if extinguished by the laboratory.

**Recording method:** The registrar records the number of white lights that have been turned off by the recording screen.

**Pilot study:**

The pilot study was conducted for the specific exercises prepared by the researcher on Sunday (14/10/2018) at 4:00 pm. The purpose of conducting the experimental experiment for the exercises is to determine and evaluate the exercises within the scientific bases.

**Equal search groups:**

In order to return the differences to the experimental factor that affects the experimental research group, the researcher conducted the parity between the experimental and control groups in some aspects of attention using the t-test of the unattached samples of the same number and to find out the difference between the two sets of dependent search variables. The calculated (t) values of the control and experimental groups in the search variables are smaller than the tabular value (2.07) in front of the freedom score (12 + 12-2 = 22) and the significance level (0.05). Therefore, the difference is statistically significant.

**Field research procedures:**

**Pretests:**

Pre tests were conducted on the experimental and control groups of the research variables, which include some aspects of attention (focus attention and divert attention) on Sunday (21/10/2018) at 4:00 pm.

**The main research experience:**

The main research experiment was carried out on Wednesday, 24/10/2018, by applying the specific exercises designed for all members of the experimental group for a period of 6 weeks and five units per week. “The changes resulting from repetition, repetition and training are usually within (6-8) weeks,” he said, citing Euroconnell.

The researcher’s share in the application of his exercises is (25) minutes taken from the application section in the main part of each educational unit to be the total time for the application of the curriculum as shown:

(25) Minutes Exercise (30) Educational units = (750) minutes Total time of application of the curriculum.

(27) Different exercises were designed according to the size of errors that appeared in the analysis of video and distributed scientifically on the number of units and the share of each unit (3-4) exercise and the proportion of exercises in the development of capacity.

**Posttests:**

Post-tests were carried out on the experimental and control groups of the variables (focus attention and divert attention) on Wednesday (5/12/2018) at (5:30 pm).

**Results**

**Presenting the results of some aspects of pre and post attention to the control and experimental research groups and analyzing them:**

Table (1). Shows the computational circles, the standard deviations of the differences, the calculated value (t) and the significance between the pre and posttests of the control and experimental groups in the search variables

<table>
<thead>
<tr>
<th>Groups</th>
<th>Variables</th>
<th>Units</th>
<th>Pretest Mean</th>
<th>Pretest SD</th>
<th>Posttest Mean</th>
<th>Posttest SD</th>
<th>(t) calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>Focus attention</td>
<td>Grade</td>
<td>16.08</td>
<td>1.75</td>
<td>16.25</td>
<td>1.68</td>
<td>5.18</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Divert attention</td>
<td>Grade</td>
<td>44.4</td>
<td>4.18</td>
<td>45.25</td>
<td>3.65</td>
<td>4.65</td>
<td>Sig.</td>
</tr>
<tr>
<td>Experimental group</td>
<td>Focus attention</td>
<td>Grade</td>
<td>16.25</td>
<td>1.58</td>
<td>19.66</td>
<td>1.88</td>
<td>11.75</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Divert attention</td>
<td>Grade</td>
<td>45</td>
<td>3.34</td>
<td>50</td>
<td>3.24</td>
<td>11.36</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The value of (t) the tabular (2.20) and the degree of freedom (12-1 = 11).
From table (1), the value of (t) calculated by focusing attention and diverting attention to the control group was (5.18, 4.65) for variables (concentration of attention, attention shift). The values (11.75, 11.36) for the experimental group and for the same variables, and to detect the significance of these differences, it was found that the value of (t) calculated greater than the value of (2.20) in front of the freedom degree (11 = 1-12) and the level of significance (0.05). And for the results of the tests of posttest and the value of the mean of the calculation of the tests.

Presenting the results of the post tests for some aspects of attention to the control and experimental research groups and their analysis:

### Table (2). Shows the computational circles, standard deviations, calculated values and significance of the post tests of the two research groups in the dependent search variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) calculated</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus attention</td>
<td>Grade</td>
<td>19.66</td>
<td>16.25</td>
<td>4.48</td>
<td>Sig.</td>
</tr>
<tr>
<td>Divert attention</td>
<td>Grade</td>
<td>50.60</td>
<td>45.25</td>
<td>3.18</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Tabular value (2.07) and degree of freedom (12 + 12-2 = 22)

Table (2) shows the results of the tests on the differences between the distance tests in the variables (attention concentration, attention shift) of the experimental and control groups and that the calculated values (t) were respectively (4.48 and 3.18). To detect the significance of these differences, (2) and (0.05). Therefore, the differences are statistically significant for the benefit of the experimental group and the values of their computational values.

**Discussions**

**Discussing the results of pre and posttests of some aspects of attention, special motor abilities and the skillful performance of the control and experimental research groups and their analysis:**

From table (1) the researcher attributes this to the effective exercises used by the trainer in the implementation of educational units and to the diversity of means of learning Skills, which include different skills that led to learning in the variables in question and in varying degrees, as well as to the repetition of the movements that had a prominent role in learning the skills studied. This is confirmed by Kurt Minell (1987), is being clear and objective direction and to improve motor mobility.  

The repetition and variation of the sample level, as well as the repetition and gradation, were easy and difficult during the execution of the units. The enhanced repetition of the exercise helped the player to master the sub-movements which represent the required skill and to achieve compatibility between these movements, and appropriate weight.  

The researcher believes that the main goal sought by educational programs through performance, menses and repetition is to improve the motor programs of the individual and improve the level of motor performance is the basis of the learning process as it works to provide the learner a range of physical and skill capabilities and increase the number of motor programs that are stored in the brain, In achieving the best levels and skills to be improved and progress in the performance during the different play situations.

**Discussing the results of posttests for some aspects of attention, special motor abilities and the skillful performance of the control and experimental research groups and their analysis:**

From the table (2) the researcher attributed this and in terms of attention to the attention-focused exercises and diverting the attention used for the experimental group, which reflected a clear image of the players as they contributed to the development of their abilities, which improved through commitment to educational units and repetition in the exercises used by the researcher, which was intended to develop attention. Other exercises contain a contribution to the mental abilities, which is to divert attention and concentration of attention and exceeded the cases of tension and frequency of some
situations that accompany the performance of skill after the player from the state of perception and memory and investment memory “The higher the focus on the players, the better the exercise will be. When there is no good focus on what is happening to you, the performance or reaction is not achieved optimally”. An important thing to consider is to help the player control the voluntary movements when performing the skill movements as the mental processes are in turn, to create the image needed for optimal performance and to choose the appropriate plan to carry out the required assignment “.11

The researcher attributes this to the components of the exercises that adopted the process of concentration of attention and turn it into a complementary stage, as well as the ability of motor compatibility and control of the performance of skills as the boxer needs high consensual performance and adaptability and the time of education and the most important focus and divert attention,12 which plays an important role in all characteristics of motor kinetics Early implementation of motor performance in accordance with a decree to implement the motor duty gives the player the opportunity to choose the quick and correct response during performance.13 This is what has been given through quality exercises to focus and transform attention. An athlete when he has a deep focus and is able to possess the special motor compatibility “,14 and this is what was achieved in the experimental group by the specific exercises that reflected the effect of positive and in the best results.15

Conclusions

Specific exercises have a positive effect on the development of some aspects of attention to the people of the National Center for Sports Boxing.

There is a difference in the results of the posttests between the experimental control groups and for the experimental group in the variables in question.

Ethical Clearance- Taken from University of Anbar committee

Source of Funding- Self

Conflict of Interest - None

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10. Esra Qahtan, the effect of concentration exercises attention and mental perception in the accuracy and speed of response to some
Functional Gastrointestinal Disorders in Pediatrics

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Abstract

Characterization over infancy then adolescent practical gastrointestinal disorders (FGIDs) has advanced in the course of the longer rome manner nowadays culminate among another rome. The generation regarding diagnose the Fgid only then organic sickness has been excluding is wan, now we bear proof in conformity with supporting symptom based diagnosis. The child adolescent rome five, we lengthen thinking means of putting off the word up to expectation in that place was “no proof because natural disease” in all the definition and replace that along “after fabulous clinical evaluation the signs and symptoms can’t lie attributed after any other scientific conditions.” This changing allows clinician in conformity with perform selective and not checking out in imitation of the guide a high-quality analysis about the FGID. The additionally point so much FGID can be coexist together with sordid medicine stipulations so much them selves end results between GI symptom (exciting bowel diseases). In Rome five, purposeful nausea and functionally vomiting currently describe. Rome third “abdominal punishment related practical gastrointestinal disorders” has been modified to “functionally stomach castigation disorder” and we have derived a modern terms, useful belly pain not in any other case specified, in conformity withdraw youth whosoever function now not suit a unique disorder, such namely cross bowel, purposeful dyspepsia, then belly migraine. Rome five FGID definition beautify clarities because of each clinician then researcher.

Keywords: Children, Adolescent, Abdominal, Nausea, Vomiting, Functionally Disorder

Introduction

Behavioral research on psychological and social effects to understand the bulge of the digestive system. The actual behavior of visceral hyperplasia and hypersensitivity detected among a huge subset of those suffering from IBS and FD is still unclear. Thinking about “visceral hypersensitivity” such as pain thresholds is much less experienced during sensorial sensory examination as it is, reporting punishment in less pressure or volumes all through frequent inflating the GI balloon catheterization (1). However, as much we bear outlined, such is becoming an increasing number of clear that psychological procedures yet psychosocial elements may affect visceral perceptual sensitivity. There are various research endorses so a multiplied psychological aptitude according to record pain, as can stand pushed by hypervigilance, underlies the diminished punishment thresholds among IBS patients, rather than improved neurosensory sensitivity. Studies of the consequences about stressors about appreciation concerning colorectal distention into healthy topics and IBS sufferers hold best particularly inconsistent findings, fit in conformity with variants amongst the stressors ancient then potent confounders, such as distraction (2). However, an instruction as controlled because distraction proved as IBS patient, not healthful subject, rated rectal distensions extra intense and unpleasant throughout dichotomously ear strength compare together with relaxations (3).

Throughout the recorded history, the decade of entertainment at home has had intimate connotations that the pace of the amount goes beyond its real function. It is usually considered personal or ambiguous. Their dysfunction is related to embarrassment, emotion, shame or strong bowel performance as required by general well-being. In addition, we understand intestinal function after dysfunction, so the animals are closely linked with strength and emotion: I find them strong in swallowing, I cannot drop that much longer, and then I
have the butterflies in my stomach. On the contrary, or perhaps as it evolves for health benefit, the substance and feces are unhealthy according to the senses; the scene or odor, or after contact with it, executes the administration according to the pathological responses, nausea, or vomiting. Each person has a scary law so that it is then combined derived next to an equal anlage, the original neural crest. This facility in the intestines also explains what is the element of tension or psychologically compounded components after the intestinal properties and dysfunction of the function, Gastrointestinal symptoms, disease, and bitter. The understanding of how these factors are pronounced in the tradition of some other factors, along with changing norms, trust systems, or prototyping, has evolved in a timely manner, the similar section traces cultural influences in terms of research, capacity for symptoms, gastrointestinal symptoms, Thus leading to the identification and classification of beneficial GI disorders.

**Environmental Influence**

Childhood environmental factor: parental belief and behavior. There is a familial total regarding morning FGID. Children about grown-up irritable bowel symptom (IBS) sufferers accomplish more fitness greatness visits than the young people on non-IBS parents. This pattern is no longer confined in conformity with gastrointestinal (GI) signs and symptoms and holds because of maternal yet paternal symptoms. Although even is permanent research within a genetic clarification because of these familial patterns, where teenagers analyze out of parents do reduct a too greater performance according to the hazard because of increasing an FGID than genetics. The primary learning principle over fantastic reinforcement or reward, described as a match following partial behavior that will increase the likelihood about so much behavior occurring among the future, is a likely contributor according to what that be able to occur. Children whose mothers enhance sickness conduct ride extra extreme stomachaches yet extra school absences than vilen children. In addition, when parents had been requested in imitation of show effective and feeling responses in imitation of their children’s punishment in a laboratory, the frequency regarding pain complaints was once higher than parents are recommended in imitation of pass by them. Finally, a great randomized scientific analysis regarding teens with useful belly punishment found as cognitive-behavioral cure (CBT) targeting coping strategies, as well as like parents’ then children’s beliefs about, or responses to, children’s discipline complaints, brought about increased baseline in accordance with follow-up decreases in discipline and GI signs compared together with an educational intervention controlling for time yet attention, yet up to expectation it impact was mediated by way of changes within parents’ cognitions as regards their child’s pain.

**Function Gastrointestinal Disorder**

Regurgitation. Reflux refers within consequence including retrograde involuntary motion concerning gastric issue within then overseas of the stomach after is often referred to as gastroesophageal reflux. When the reflux is immoderate ample afterward maintain visualized certain is called regurgitation. Regurgitation atop stomach contents among the esophagus, mouth, and/or nose is widely used among kiddies afterward is inside the predicted quantity about behaviors amongst sound infants. Infant regurgitation is the most common FGID within the advanced yr concerning life. Recognition over infant regurgitation avoids useless scientific medical doctor visits then bold investigations yet remedy because about gastroesophageal reflux sickness (GERD). Infant regurgitation is super out of vomiting and is described by using an internal frightened system exposure involving both autonomic and skeletal muscle agencies concerning who gastric factor are forcefully expelled thru the trencherman due to the fact over coordinated actions upstairs the youthful bowel, stomach, esophagus, and diaphragm. Regurgitation is moreover excellent out of ruminating, inside who till at present swallowed food is returned in accordance in imitation of the pharynx or mouth. When the regurgitation about gastric issue reasons troubles or contributes of accordance concerning adroitness injury and irritation (eg, esophagitis, obstructive apnea, wonder full airway disease, pulmonary aspiration, maintenance, and all difficulties, afterward failing into pursuance including thriving), such is referred in accordance with as like GERD.

The cause because of acceptance regarding diagnostic entities. Based regarding medical experience, especially about youngsters alongside anxiousness then depression, practical nausea but realistic vomiting are at existing blanket ed of Rome IV. Some sufferers maintain nausea alone, partial bear vomiting alone, but scrappy have nausea then vomiting. We agree with so much the absence over concomitant discipline between
that troubles suggests he ought to now not continue to be sure namely portion regarding beneficial dyspepsia. Pathophysiologic considerations. Clinical evaluation. We preserve set up realistic nausea and beneficial vomiting as detach entities, but sufferers together with chronic nausea dense times file mild vomiting including more than a few frequencies. The attendance of extreme vomiting amongst culling in pursuance with nausea affords a one-of-a-kind state of affairs among as like middle anxious governance disease, GI anatomic abnormalities (eg, malrotation), gastroparesis, or inner pseudo-obstruction hold excluded. Biochemical trying out may also also encompass pardon regarding serum electrolytes, calcium, cortisol, or thyroid hormone levels. Intestinal bunker but dynamism troubles (eg, gastroparesis, inner pseudo-obstruction) labor in conformity with posture considered then cut far away from the appearance regarding recurrent vomiting. Kin about useful nausea or vomiting after sluggish gastric emptying in teens is no longer in reality established. We did no longer consider an everyday pinnacle GI endoscopy a makes use of because of forecast on practical nausea besides vomiting. Psychological evaluation is imperative in younger people inclusive of practical nausea afterward practical vomiting (11).

Clinical evaluations

Effortless repetitive regurgitation, swallowing, and/or spitting inside minutes in regard to beginning a feast outline rumination. Other ordinary complaints correspond concerning stomach pain, bloating, nausea, heartburn, then a number of somatic symptoms, absolute namely headaches, dizziness, yet sleeping difficulties. Differential foreboding includes gastroesophageal reflux, gastroparesis, achalasia, bulimia nervosa, and ignoble purposeful then bodily gastric yet tiny inside diseases, but within none regarding what entities does the regurgitation bust location directly away later on eating. One instruction suggested to that amount high-resolution esophageal manometry execute discover subgroups including surprising mechanisms touching disease to up to expectation total reply to precise management techniques stability (12).

Treatments

An uncompromising understanding of cogitation omen yet a colorful inspiration according to conquer that are fundamental among achieving successful treatment. Due to concept syndrome does posture conceptualized into phrases regarding a discovered habit, remedy hourly has historical techniques profitable in the administration upstairs dependancy disorders. A worthwhile current inpatient interdisciplinary strategy so worried pediatric psychology, pediatric gastroenterology, scientific nutrition, toddler life, remedy recreation, afterward rubdown therapy has been mentioned between younger people along with so condition (13).

Morbidities

Morbidity associated with FGIDs is among overall psychosocial. Pain interferes collectively together with day-to-day college appearance afterward performance, mate relationships but distribution in household yet non-public activities. One outdoors concerning x teens together with practical belly punishment attends college into deep situations whilst extra than 28% in relation to sufferers have absenteeism larger than secure day concerning people Data beyond adults undergo tested according to that amount victims whosoever suffer beyond FGIDs may also additionally undergo cough difficulties, headaches, dizziness yet fatigue. Similar studies, however, are lacking in pediatrics. Furthermore, psychological issues definitive specifically anxiety and fail are common. Children alongside FAP bear a leaning into conformity on maintaining a lower attribute concerning entity than wholesome teenagers but the comparable multiplication on existence specifically sufferers along with demonstrable herbal gastrointestinal disease. There are additionally pointers, therefore, siblings concerning teens inclusive of FGIDs journey extra emotional/ behavioral signs and symptoms than their peers however their symptoms are not quite virtually identified by way of their mother and father (14). Children which include persistent belly discipline preserve immoderate utilization about the fitness outweigh system namely as they, along collectively along with their parents, pray solutions due to the fact the unexplained stomach pain. They hold a couple of visits between consequences with healthcare vendors and may also also even petition 2nd but third opinions. They document the challenge about lowlife a widespread background upon to desire is neglected through road about their provider. As a result, pediatricians may also additionally experience compelled then concern victims in imitation of a doublet about tests, which includes pick tests, radiological lookup afterward endoscopies according to preserve outside from missing a big illness.
Figure 2. Functionality gastrointestinal disorder dominant diagnosis in Norwegian children with abdominal pain. FAP=functional abdominal pain. IBS=irritable bowel syndrome. (10)

Functional Dyspepsia

The prevalence involving dyspepsia varies in 3.5% and 27% relying related to affect us on a respecting the origin. The recurrent abstention afterward discipline situated into the higher abdomens as much is not relieved with the aid of defecation, not related collectively along with an exchange among stool pattern than no longer defined with the aid regarding a natural disease. The penalty needs to recur at least as soon as a hebedomad for at least two months due to the fact on foreboding afterward remain made. Dyspepsia is typically polysymptomatic. Ninety-nine percentage above big sufferers bring extra than associate symptoms, more than 80% file larger than signs a lot less than 0.1% record partial symptom. The castigation or castigation may additionally posture related in conformity with vomiting, nausea, stomach fullness, bloating but rapidly satiety. The referred in imitation of and 26% over 127 pediatric subjects had ulcer-like symptoms even as 15% manifested dysmotility like signs (16).

Prognosis

Every baby is pronounced in regard to the natural history of FGID. In adults, the occurrence over Ibs and Fd is regular upstairs time, alternatively collectively including a big turnover inside multiplication status. Patients who have diagnosed along with realistic stomach judgment no longer fast end on abject a natural disease as regards approximate follow-ups. after his colleagues pronounced to that amount volume 30% - 45% on their sufferers together with continual stomach judgment persisted between accordance together with journey discipline then two years touching a follow-up but it have an impact on concerning the kid’s behavior, social functioning afterward usage regarding fitness greatness decreased. The proven above according to desire on to 70% on young adults alongside dyspepsia had been asymptomatic yet an awful bunch elevated intestinal 2 years over the diagnosis. Other studies, however, observed so 30%-50% on formative years which includes continual purposeful stomach castigation seasoned frugality as many adults via the discipline restricted everyday activity inside totally 30%. Moreover, victims are more into the whole likelihood than controls afterward trip anxiety, somatization, hypochondriasis, yet associative dysfunction as like adults. Studies endure proven then extreme symptoms at the gratuity namely accurate as much an as improvement within signs and signs at three months bear been related alongside with greater prognosis, whilst psychological elements but judgment tolerance hold been terrible prognostic warning signs (17).

Conclusion

Chronic belly castigation of infancy remain very difficult clinic essence according the average pediatrician as properly as specialist. The differential analysis enormous then no confirmatory laboratory marker. However, including beyond Rome criteria, white records then absolute bodily examination in mixture with restricted laboratory then imaging research now indicated need to conduct in accordance to the diagnosis. FGIDs the purpose concerning giant anxiety, immanency, and illness into young people so nicely namely adults. As our perception about this stipulations improves, our medicine interventions pleasure growth too, no longer solely try after take them, however additionally in conformity with interfering promptly into the disorder direction hence namely according to the rule in long term. Pediatrician have to keep aware of doubtlessly modifiable morning chance factor then must provide this young person and their households a therapeutic option so takes within a score the physiological properly as the psychological factors about the diseases.
Ethical Clearance: People identified as potential research participants because of their status as relatives or carers of patient’s research participants by virtue of their professional role in the university and departments.

Source of Funding: Self-Funding

Conflicts of Interests: The authors declare there is no conflict interests.

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The impact of Api toxin (Bee venom) on promastigote on both Leishmania tropica and Leishmania Donovani in Vitro

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Abstract

Leishmaniasis is a type of serious diseases which is triggered by a protozoan parasite of the species Leishmania. It has been known for many hundreds of years. This disease is transmitted by a sand fly’s bite which is known as subfamily Phlebotominae. Limited drugs are available for the treatment of Leishmaniasis, and general drugs have many side effects on patients. These necessitate the need for urgent active treatment of leishmaniasis. The aim of the study is to develop a new type of antileishmanial agent instead of the classical drug by investigating the effectiveness of Api toxin (Bee venom) on the phase promastigote of both Leishmania tropica and Leishmania donovani in vitro.

The cytotoxic effect of Bee venom was evaluated by exposing L.tropica, and L.donovani promastigote phase was exposed to six diverse concentrations (1, 2, 3,4,5,6 and 5µg/ml) and determined by colorimetric assay (MTT) after 4hr. The outcomes of the study showed high effectiveness on parasites numbers in the same concentrations reached to inhibitory growth (the viability percentage of promastigote). The cytotoxic effect (MTT) was decreased by increasing the concentrations with the same amount of time, which reached to (22.83± 1.67) and (72.46 ± 1.49) after 4hr in 5µg/ml of a cytotoxic solution of Bee venom for Leishmania tropica and Leishmania donovani successively. The IC₅₀ was also calculated depending on the results of the MTT assay to determine the most effective concentration of Bee venom on the viability of Leishmania tropica promastigotes. The result was 1.3 µg/ml. The conclusion of the study is that the Bee venom – based treatment has a very important role in overcoming cutaneous leishmaniasis as results showed the high inhibitory effects on L.tropica at low concentration in vitro.

Keywords: Leishmania tropica, Leishmania donovani, Phlebotominae

Introduction

In tropical regions, leishmaniasis stands second after malaria in having a high morbidity and mortality burden leading to economic loss. An obligate intramacrophage protozoan of the class Leishmania is the cause of Leishmaniasis. Protozoan parasitic diseases are considered as a serious threat for public health. The types which are widely known are cutaneous leishmaniasis (CL), mucocutaneous and visceral leishmaniasis (VL), or kala-azar. In the Indian subcontinent and Africa, Leishmania donovani causes is the causal organism of VL in these places, whereas in Mediterranean basin VL is caused by Leishmania infantum. Flagellated Promastigotes are the major morphological forms in the life cycle of Leishmania. They reproduced and grow in the vector’s midgut (sand fly). Then they are curved amastigotes, which bread within the vertebrate host’s macrophages. The infection happens through the inoculation by the insect bite of metacyclic promastigotes into the vertebrate host. In the wound area, the parasites meet different cell types such as neutrophils, and dendritic cells, keratinocytes Langerhans and tissue macrophages, all help as the

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primary contact host cell. Lanier (2000) suggested that the innate immune response against Leishmania includes phagocytes, Natural Killer (NK) cells, and cytokines. However, believe that Phagocytosis and anti-leishmanial activity of macrophage are major factors in the elimination of Leishmania parasites. One route to estimate the infectivity of Leishmania and anti-parasite immune response is to assess the germicidal activity of macrophages via the generation of reactive oxygen and nitrogen intermediates, particularly nitric oxide. The responsive nitrogen species (RNS) and responsive oxygen species (ROS) within the host cell are the cellular main arms against Leishmania. At the process of the change of L- arginine to L- coralline NO is produced by nitric oxide mixtures (NOS). The membrane – bound NADPH-dependent oxidases (NOX) generate O2- and other reactive oxygen species (ROS). These ROS contribute to the formation of others as nitrogen trioxide NO2 and ONOO- . Antimonial compounds are the first-line drugs cure for leishmaniasis (e.g., meglumine antimoniate and sodium stibogluconate). Second – line drug is Amphotericin B is exhibiting teratogenic effects and nephrotoxicity. Miltefosine is an oral treatment to treat leishmaniasis. The scientific researchers are motivated to develop more effective drugs due to the fact that treatment failure rates are tremendously high. these therapeutic protocols are usually expensive and cannot be used efficiently by poor countries. Moreover, these drugs are associated with increasing parasite resistance, severe toxicity, hard to administer and poor efficiency in widespread countries. Son et al., (2007) advised that Api-toxin is produced and secreted by a gland which exists in the abdominal cavity of the Bee and consists of a complex mixture of several biologically active peptides including Mellitin (MEL), enzymes, bioactive amines, and non-peptide components that has different medicinal features. Previous research explained that the biological MEL effects of as antifungal, antiviral, antibacterial, anti-parasitic, and anti-tumor and proposed the origin of MEL action as a non-selective cytolysis’ peptide which disrupts all prokaryotic and eukaryotic cell membranes physically and chemically. Different methods are used to monitor the responses and health of cells after treatment with various stimuli such as assays to measure proliferation, viability, and cytotoxicity. One of the important factors in experiments is to know the number of viable cells are remaining when the experiment finishes such as: ATP detection, reassuring reduction, tetrazolium reduction (MTT assay) and protease markers. The MTT (3-(4,5-dimethylthiazol-2-Yi)-2-5-diphenyltetrazolium bromide) tetrazolium reduction assay is a quantitative, sensitive, and dependable colorimetric assay for measuring cell metabolic activity, proliferation, viability and activation of cells. Died Cells cannot convert MTT into formazan, when viable cells with active metabolism convert MTT into a purple colored formazan product with an absorbance maximum near 620 nm, thus color formation serves as a useful and convenient marker of only the viable cells. To conclude the aim of this study is to evaluate the antileishmanial activity of Api toxin (Bee venom) on metabolic activity (viability) and proliferation percentage of Leishmania tropica and Leishmania donovani parasites in promastigote stage in vitro condition.

Materials and Method

1. Venom collection:
Venom is collected from Apis mellifera which are Africanized honeyBees (AHBs) which their ages ranges (30-40) days. Venom goes through processes such as extraction which occur through simulation electrically two times a week, isolation and distillation of melittin by process of phase liquid chromatography (RP-HPLC) (University of Baghdad Faculty of agriculture apiaries).

2. Leishmania Tropica and Leishmania donovani Parasites isolate: -
It was obtained from parasitology lab postgraduate students in the College of science, University of Baghdad. These parasites were maintained and subcultured in Novy- MacNeal-Nicolle (NNN) every 1-2 weeks until started using them.

3. Testing the possibility of the parasites: -
Assays used are: Cytotoxicity MTT (3-4,5-dimethylthiazol-2-Yi)-2-5-diphenyltetrazolium bromide).

Firstly, A cell-based assays are used: in order to screen groups of compounds and to decide if the molecules have an effect on cell proliferation or in order to show if direct cytotoxic effect leads to the death of cells.

Secondly: cell-based assays are also generally used to assess receptor binding and a variety of signal transduction events that could be involved in monitoring
organelle function or in the expression of genetic reporters or transferring of cellular components.

MTT is a salt tetrazolium which is soluble in water yielding a yellowish solution. Cleavage of tetrazolium ring by dehydrogenating enzymes is used to change dissolved MTT to an insoluble purple formazan. Verma and Dey (2004) suggested that Dimethyl Sulfoxide (DMSO) is used to change this water-insoluble formazan into solubilized. There is a way to measure the dissolved material by Spectro photometrically yielding absorbance as a purpose of the concentration of converted dye in the following formula:

\[
\text{Viable cells (\%) = } \frac{(AT- AB)}{(AC- AB)} \times 100
\]

Where

\begin{itemize}
  \item AT: is the absorbance of the treated samples
  \item AC: is the absorbance of the untreated samples
  \item AB: is the absorbance of the blank
\end{itemize}

- The promastigotes of both Leishmania tropica and Leishmania donovani at a concentration of 1x10^4 parasite/ml and test compound (Api toxic Bee venom) were prepared and dispensed in a good microtiter plate of flat-bottom 96-, containing a final volume of 100µl / well.

  \- The temperature of incubating the microtiter is 26°C for 24hr.

  \- To add ten µl of MTT solution per well to get a final concentration of 0.5 mg/ml

  \- The duration of incubating the microtiter plate is 4hr at 26°C.

  \- In order to solubilize the formazan crystals, the media was removed, and 100µl of DMSO solution was added.

  \- Stirring gently the micro titer plate gently left for ten minutes

  \- The reading of absorbance was at 620 nm using ELISA reader.

In order to detect different factors in this study, the statistical analysis system- SAS (2012) Program was used.

- The Least significant difference-LSD test was used to find out the right comparison between means in the study.

- Excel program to calculate the values of IC50 is used to determine the right concentration so the parasite can inhibit by 50% (IC50).

**Results and Discussion**

This research presented the effect of different concentration (1, 2, 3, 4, 5, 6 and 5µg/ml) of Api toxic Bee venom on *L. tropica* and *L. donovani* promastigotes number. The parasites treated with all concentration of Api toxic Bee venom showed significant (p<0.05) differences there was a decrease in the number of the parasites in the comparison between *L. tropica* and *L. donovani*.

**Table (1): comparison between the effect of different concentrations of Api toxic Bee venom against *L. tropica* and *L. donovani* promastigotes number after 4hr**

<table>
<thead>
<tr>
<th>Api toxic Bee venom Concentration (µl/ml)</th>
<th>Percentage of viable cells</th>
<th>LSD value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>L. tropica</em></td>
<td><em>L. donovani</em></td>
</tr>
<tr>
<td>1</td>
<td>60.13 ± 2.62</td>
<td>87.97 ± 1.04</td>
</tr>
<tr>
<td>2</td>
<td>58.32 ± 0.56</td>
<td>77.52 ± 1.07</td>
</tr>
<tr>
<td>3</td>
<td>50.12 ± 1.41</td>
<td>75.93 ± 0.63</td>
</tr>
<tr>
<td>4</td>
<td>39.02 ± 2.06</td>
<td>71.07 ± 1.67</td>
</tr>
<tr>
<td>5</td>
<td>26.01 ± 1.01</td>
<td>51.33 ± 0.68</td>
</tr>
<tr>
<td>6</td>
<td>22.83 ± 1.67</td>
<td>72.46 ± 1.49</td>
</tr>
<tr>
<td>LSD value</td>
<td>8.225</td>
<td>7.986</td>
</tr>
</tbody>
</table>

Log (concentration ) µg/ml
Figure (1) the IC50 of Api toxic Bee venom against *L.tropica* promastigotes number after 4hr

The number of promastigotes treated with Bee venom with a high concentration (6 and 5 μg/ml) after 4hr was 22.83 ± 1.67 and 72.46 ± 1.49 x 10^4 cell/ml of *L.tropica* and *L.donovani* respectively as shown in the table (1),fig (1). The results in this research showed that there are substantial differences (p< 0.05) between different concentrations of the Bee venom toxin. *L.donovani* promastigotes treated with Bee venom showed high viability compared to those treated with *L.tropica* in all concentrations, and these results indicated the positive effects of Bee venom toxin on the proliferation of promastigotes form of *L.tropica*. The data used showed that the most effective venom was melittin which is about 3-fold more effectiveness against *Leishmania Tropica* promastigotes than the whole venoms. Diaz-Achirica *et al.*, (1998) has research about the activity of melittin against *Leishmania donovani* promastigotes which showed that an IC50 value of 0.87 μg/ml, which causes damage to the parasite’s plasma membrane. Whereas in this study, as the report above shows that *Leishmania donovani* promastigotes were about 32-fold more resistant than *L. tropica*. 16, 17.

Melittin is a type of Bee venom protein which is introduced as a potential adjuvant. Although Bee venom is a traditional oriental medicine which has been used widely, yet no detailed effects on Th1 and Th2 immune response are outlined. Moreover, it is not useful to increase the number of Bee stings. Mahmoud (2012) suggested that scientifically proved that to measure the exact amount of melittin to standardize and regulate Bee venom doses to be used as a treatment. Medical properties were tested in vitro on *Leishmania* spp.

El-Haj *et al.*, (2009) showed in his study that honey Bee venom has lethal effects on both types of *Leishmania: Leishmania major* and *Leishmania donovani* which depends on its concentration. The results showed that the maximum effect was achieved when a higher concentration of honey bee was used. (1 mg of venom) giving an initial 100% mortality.

**Conclusion**

The conclusion of the study is that the Bee venom – based treatment has a very important role in overcoming cutaneous leishmaniasis as results showed the high inhibitory effects on *L.tropica* at low concentration in vitro.

**Conflict of Interest:** The author declares no conflict of interest.

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**Ethical Clearance:** taken from Institutional Ethical Committee
References


19. Mageeda Siddig El-Haj, Prof. Mohammed Saeed A. El-Sarrag, and Dr. Muawia M.

Hematological and Biochemical Profile of Iraqi Breed Pekin Ducks

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Abstract

Fifty white male one week old Iraqi Pekin ducks were used to investigate their hematological biochemical values. The birds used were purchased from the commercial breed of poultry farming halls of Animal Production Department in Kufa Technical Institute; bred for 8 weeks, then, 5 ml of blood per bird was collected via brachial vein and send to lab to be analyzed. Some of important results were measured as (mean ± standard deviation) as follows: red blood cell (RBC) 4.650 ± 0.761 x 10⁶/ cubic millimeter (c mm), hemoglobin (HB) 13.293 ± 1.6467 g/dl, packed cell volume (PCV) 39.103 ± 2.6397%, white blood cell (WBC) 8.243 ± 2.3372 x 10³ / cmm, Lymphocyte 19.433 ± 5.6466 x 10³ /cmm, Cholesterol 144.447 ± 28.3941 mg/dl, Glucose 261.007 ± 66.7837 g/dl, total serum protein 4.405 ± 1.6086 g/l, sodium 155.543 ± 12.0153 m mol/ l potassium 3.740 ± 1.7138 g /l and calcium 9.610 ± 2.5395 mg/dl.

Keywords: Iraqi Pekin, RBC, WBC, cholesterol and serum protein.

Introduction

Domestic ducks have served from ancient times as a source of food in many parts of the world, mallard ducks (Anas platy rhynchos) were domesticated of over 4000 years which led to the development of the Pekin ducks (commercial breed)¹, ducks’ production is a rapid growing industry worldwide with six fold rate of consumption greater than 1960³. Ducks had the ability to subsist and grow on a relatively simple diet based on locally available feed stuff⁴. Approximately 90% of their adult weight at 7 weeks of age were much better than common ducks even under less optimum conditions and for their ability to tolerate hot weather¹⁵. Hematological and serum biochemical profiles will provides reliable information of animals’ health status⁶ and reflect a responsiveness to their internal and external environment⁷. Hematological analysis can be useful for the diagnosis of birds’ diseases⁸. There is a limited research on the hematological and biochemical profiles in Pekin ducks which were bred in Iraq recently; so this may be the first study that reported the normal hematological profile and some of the biochemical values. These information may form important reference data for the routine diagnosis and management of diseases and nutritional problem.

Materials and Method

Animals:

Fifty white male one week old Pekin ducks were used for this study, purchased from the commercial breed of poultry farming halls of Animal Production Department in Kufa Technical Institute. The birds were bred for 8 weeks from February the first to the 31st of March 2016, in an environmentally controlled room. They were fed commercially prepared feed contains 22% protein for the first four weeks and 17% protein for the remaining period in addition to vitamins, minerals and green food. Water was provided for ad libitum consumption over the entire study period (8 weeks), approximately 8 kg per duck weekly⁹. At the age of 8 weeks, the duck’s weight

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ranged between 3 to 3.5 kg and then blood collection started. The ducks have not been treated against disease and parasites, but were inspected daily for any health problem.

Sample collection:

Approximately 5 ml of blood per bird was collected via brachial vein in heparinized tubes, all blood samples were collected at 8-9 a.m and refrigerated immediately before being sent to be analyzed in the laboratories of the Pathological Analysis Department in Kufa Technical Institute for hematological and biochemical assay. Red blood cell (RBC) and white blood cells (WBC) were counted using hemocytometer. Packed cell volume (PCV) was determined using microhematocrite method, while hemoglobin concentration was measured by HB meter. The glucose level was measured using enzymatic method (glucose oxidase method), where serum protein total is calculated by the Biuret method and the total cholesterol is measured enzymatically. The data was calculated as the mean value ± standard deviation (STD)

Results and Discussion

The mean of values of RBC, PCV and HB in table 1 and WBC in table 2 were higher than the values reported by10 for local Muscovy ducks of southern Nigeria and in dabbling ducks11. Also PCV values in the study were higher than those of southern Nigeria adult Pekin ducks, Indian native ducks, Diving and Dabbling ducks11, which may be related to the differences in local environment or nutrition systems8, and this trait could be behind the heat tolerance in local duck breeds12. The values of HB and PCV in the study (table 1) agree with the work on mallard13 and were less than those reported for mallard and laboratory ducks14, but higher than values reported for a group of six weeks old Pekin duckling15, this could be because of seasonal changes or might only reflect species or age differences15 or due to the differences in nutrition as mentioned in16. The results of PCV and HB in this study are close to another study on the mallard reared under the traditional extensive management system in Funtua a north central region of Nigeria17, who reported the averages of PCV and HB for the birds of different ages while the birds in this study were maintained under intensive care and were at 8 weeks age at the time of (sample collection), it’s possible that the values reflect the effect of better nutrition. Species and sex were reported to have strong effect on avian hematological parameters18.

Table 1: The hematological values of pekin ducks.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation ± (STD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC 10 %c mm</td>
<td>50</td>
<td>2.6</td>
<td>5.9</td>
<td>4.650</td>
<td>0.7610</td>
</tr>
<tr>
<td>HB g/dl</td>
<td>50</td>
<td>10.9</td>
<td>18.9</td>
<td>13.293</td>
<td>1.6467</td>
</tr>
<tr>
<td>*MCV Um³</td>
<td>50</td>
<td>64</td>
<td>94</td>
<td>83667</td>
<td>6.8699</td>
</tr>
<tr>
<td>**MCH pg</td>
<td>50</td>
<td>7.6</td>
<td>31.7</td>
<td>27.570</td>
<td>4.7156</td>
</tr>
<tr>
<td>***MCHC</td>
<td>50</td>
<td>28.9</td>
<td>34.3</td>
<td>32.003</td>
<td>1.4677</td>
</tr>
<tr>
<td>PCV %</td>
<td>50</td>
<td>34.4</td>
<td>48.3</td>
<td>39.103</td>
<td>2.6397</td>
</tr>
<tr>
<td>****Plt. 10³/c mm</td>
<td>50</td>
<td>146</td>
<td>390</td>
<td>207</td>
<td>56.9677</td>
</tr>
</tbody>
</table>

* = Mean Corpuscular Volume, **= Mean Corpuscular Hemoglobin, *** = Mean Corpuscular Hemoglobin Concentration and **** = Platelets count.
Table (2): White blood cells parameters values in Pekin ducks

<table>
<thead>
<tr>
<th>Parameters</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation (STD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC $10^3$ /mm</td>
<td>50</td>
<td>3.7</td>
<td>11.6</td>
<td>8.243</td>
<td>2.3372</td>
</tr>
<tr>
<td>Lymphocyte $10^3$ /mm</td>
<td>50</td>
<td>10.2</td>
<td>31.6</td>
<td>19.433</td>
<td>5.6466</td>
</tr>
<tr>
<td>Monocyte $10^3$ /mm</td>
<td>50</td>
<td>2.7</td>
<td>8.8</td>
<td>4.987</td>
<td>1.7723</td>
</tr>
<tr>
<td>Neutrophil $10^3$ /mm</td>
<td>50</td>
<td>2.7</td>
<td>9.4</td>
<td>6.077</td>
<td>2.1540</td>
</tr>
<tr>
<td>Granulocyte %</td>
<td>50</td>
<td>41.6</td>
<td>87.1</td>
<td>69.243</td>
<td>11.964</td>
</tr>
</tbody>
</table>

The results of WBC which were counted in table 2 showed less than those data presented by\textsuperscript{19} on laboratory ducks and on the Cairina Moschata ducks\textsuperscript{9}, while the lymphocyte count is slightly higher than another studies on Pekin ducks in other countries\textsuperscript{9,20}, neutrophil count in this study was similar to those in\textsuperscript{21} and more less than those of\textsuperscript{22}. These changes may be due to controlled environment since the ducks used in this study were not exposed to stress which cause WBC’s count to be high or because of species differences. The WBC’s values was also higher than the values in Nigerian ducks\textsuperscript{10,23}, nevertheless the WBC’s value in the this study was lower than those reported in the black duck\textsuperscript{22} and wood duck\textsuperscript{24}, the observed of lower WBC’s count in this study disagreed with reports\textsuperscript{9,11}. Total leukocyte, lymphocyte and Neutrophils, have been reported to be higher during dry than wet season\textsuperscript{25,26}. There wasn’t any significant effect of season observe\textsuperscript{27} on total lymphocyte count (TLC), but\textsuperscript{28} observed that the highest RBC’s, HB’s, PCV and WBC’s values showed increasing pattern from anestrus to proestrus, the higher level of WBC in our study may be due to the infertility of our commercial breed\textsuperscript{29,30} demonstrated significant cyclic changes in TLC, blood PH and total protein but not in RBC and its indices in sows.

Table (3): Biochemical values in Pekin ducks

<table>
<thead>
<tr>
<th>Parameters</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation (STD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol mg/dl</td>
<td>50</td>
<td>108.4</td>
<td>194.3</td>
<td>144.447</td>
<td>28.3941</td>
</tr>
<tr>
<td>Glucose g/dl</td>
<td>50</td>
<td>180</td>
<td>384.9</td>
<td>261.007</td>
<td>66.7837</td>
</tr>
<tr>
<td>total protein g/l</td>
<td>50</td>
<td>2.04</td>
<td>9.4</td>
<td>4.405</td>
<td>1.6086</td>
</tr>
</tbody>
</table>

The values of cholesterol (table 3) in this study were higher than other studies\textsuperscript{31,32} but similar to the value given by\textsuperscript{33}. Sumiati and Wiryawan\textsuperscript{34} illustrated that breed age and management may influence some serum biochemical constituents in duck\textsuperscript{31}. The values of total protein in table 3 agreed with results of control group of Pekin ducks in other study\textsuperscript{31}. The total serum protein levels perhaps are reflection of greater protein intake this explain was described by\textsuperscript{34,35} as well. Moreover increase protein intake in poultry may enhance resistance to infection\textsuperscript{31,36}.
Table (4): Electrolytes values in Pekin ducks.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>sodium mmol / l</td>
<td>50</td>
<td>139.2</td>
<td>186.3</td>
<td>155.543</td>
<td>12.0153</td>
</tr>
<tr>
<td>potassium g/l</td>
<td>50</td>
<td>1.3</td>
<td>8.6</td>
<td>3.740</td>
<td>1.7138</td>
</tr>
<tr>
<td>calcium mg/dl</td>
<td>50</td>
<td>7.9</td>
<td>18</td>
<td>9.610</td>
<td>2.5395</td>
</tr>
</tbody>
</table>

The mean sodium concentration in the Iraqi Pekin ducks was (155.543) (table 4) which was similar to the values reported by10 in the Nigerian duck while the values of potassium (3.740) is clearly lower than that, the mean calcium values (9.610) was similar to the value reported by11 for adult Diving and Mallard ducks, but higher than the levels reported in guinea fowls8. The differences in nutrition may be responsible for this disparity or it may be because the differences between species12,16.

Conclusion

As a conclusion Iraqi Pekin ducks breed had adapted to Iraqi arid and semi-arid environment successfully and had their specific hematological and biochemical parameters which may deviate from other breed in main species. In general RBC, PCV, HB and WBC values were higher than those in other foreign breeds except those of 19. Lymphocyte and neutrophils’ count were slightly higher and similar to other breed respectively. The biochemical traits were similar with other in general except the cholesterol level which be higher than some other breed like those of31,32. The concentrations of sodium equaled with Nigerian duck while the values of potassium is clearly lower than that. The mean of calcium values was similar to the value for adult Diving and Mallard ducks, but higher than the levels reported in guinea fowls.

Conflict of Interest: One of the authors have any conflicts of interest to declare.

Source of Funding: The research was performed independently, there is no funding, influence over study design, analyses, manuscript preparation, or scientific publication.

Ethical Clearance: The project was approved by the local ethical committee, Technical Institute, University of Al-Furat Al-Awsat Technical.

References


The Influence of Learning with Mobile Application in Improving Knowledge about Basic Life Support

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Abstract

Introduction: Basic Life Support (BLS) knowledge and abilities are important for all people to help the survival life of someone who experiences life-threatening conditions, such as cardiac arrest. Nursing students are one of the bystander components to provide assistance in emergency situation.

Aim: The aim of the study was to determine the influence of providing BLS learning with mobile application in knowledge improvement.

Method: The study used a pre-test and post-test of true-experimental design with two comparison groups. The groups were control group and experiment group. The research location was at STIKes Kendedes School of nursing, Malang, Indonesia. Forty eight students were recruited using simple random sampling. Each group consisted of 24 students. The paired t-test and independent t-test was used for data analysis.

Findings: The findings showed that there was a significant difference of BLS knowledge between mobile application group and traditional method group (p = 0.016 < 0.05).

Conclusions: In conclusion, the findings highlight that mobile application has more significant influence on BLS learning in nursing students by improving their knowledge. The use of mobile application provides opportunities to make learning process more accessible and flexible.

Keywords: Basic Life Support (BLS), mobile application, traditional method

Introduction

Prevalence of cardiac arrest in the world tends to be high. In United States, cardiac arrest events reach more than 166000 incidents in a year, and 60% of them are handled well, but only 6.4% can survive until they are discharged from hospital⁴. In Indonesia, prevalence of cardiac arrest is approximately 10000 incidents in a year, or 30 incidents in a day⁵. Data from Harapan Kita National Heart Center Hospital in Indonesia show that 26.9% of patients who came to the Emergency Department were diagnosed with Acute Coronary Syndrome (ACS). This condition has the potential to cause cardiac arrest⁶. Therefore, BLS action on cardiac arrest victims needs to be given immediately for reducing victims’ morbidity and mortality.

Knowledge and abilities of Basic Life Support (BLS) are important for all people to help the survival life of someone who experiences life-threatening conditions. The incidence of cardiac arrest, choking, and other life-threatening conditions require appropriate and immediate treatment by anyone. Anyone who finds the victim and gives first aid is called a bystander. The victim’s survival life can be achieved depends on bystander’s readiness and ability to carry out BLS action⁷. Nursing students are one of the bystander components who are authorized to provide BLS in emergency situations.

Important things need to be taken by introducing early basic actions to save lives, such as BLS learning.
BLS learning has been provided with different methods. The standard curriculum in BLS learning process nowadays is using traditional methods, such as lectures and demonstrations. However, several previous studies stated that traditional methods have not been effective in improving student knowledge. One study stated that the combination of two traditional methods (lecture and discussion) did not provide a significant impact in BLS knowledge\(^5\).

Along with advances in technology system, BLS learning methods are also developing. Non-traditional learning methods using technology have more effectiveness than traditional method. One of the learning methods using technology is through mobile application. The concept that distinguishes between mobile application and other is focusing on student mobility, so they can learn in a more flexible way\(^6\). Learning with a mobile application can help students learn anytime and anywhere, so the opportunities for learning will be more various.

Knowledge increases through various approaches in a learning process, including knowledge about BLS. The results of previous study regarding the use of technology as a method of learning BLS theory with educational video games in high school students showed that there was a significant impact in the knowledge aspect\(^7\). Based on the literature review above, researchers want to develop technology-based learning methods with mobile application. Finally, this study aimed to find out changes in nursing students’ BLS knowledge through mobile application learning.

### METHOD

The type of research was true-experimental study with a pre-test and post-test control group design. The study was conducted at STIKes Kendedes School of nursing, Malang, Indonesia. The total respondents were 48 nursing students who were divided into two groups, the control group and the experiment group. Each group consisted of 24 respondents. Respondents were obtained using simple random sampling technique.

The data was taken twice, before and after BLS learning. The control group received BLS learning with traditional methods (lectures and demonstrations) and the experimental group received BLS learning using mobile application. BLS knowledge questionnaire was developed by researchers based on the concept and guidance of American Heart Association (AHA) in 2015. The score on the questionnaire in each question is 0 if the answer is wrong and 10 if the answer is correct. Validity and reliability tests were carried out on 15 respondents. In 30 questions, 20 questions were declared valid and reliable.

The mobile application in this study was named “Life Saving: Learning and Guideline”. The characteristics of this mobile application include text, images, and audio recordings. While, the features offered are BLS concept menus, BLS stages, exam menus, location maps, and audio recording of the chest compressions frequency. The paired t-test and independent t-test was used for data analysis. This study was stated ethically feasible by the Health Research Ethics Commission in Faculty of Medicine, Universitas Brawijaya with number series 20 / EC / KEPK – S2 / 01 / 2019.

### Table 1: Demographic data of respondents

<table>
<thead>
<tr>
<th>No</th>
<th>Characteristics</th>
<th>Total (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>15-19 years old</td>
<td>28</td>
<td>58,3</td>
</tr>
<tr>
<td>b.</td>
<td>20-24 years old</td>
<td>20</td>
<td>41,7</td>
</tr>
<tr>
<td>2</td>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Male</td>
<td>3</td>
<td>6,3</td>
</tr>
<tr>
<td>b.</td>
<td>Female</td>
<td>45</td>
<td>93,8</td>
</tr>
<tr>
<td>3</td>
<td>Current education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Diploma</td>
<td>32</td>
<td>66,7</td>
</tr>
<tr>
<td>b.</td>
<td>Bachelor</td>
<td>16</td>
<td>33,3</td>
</tr>
</tbody>
</table>
Findings

Table 1 showed if the average age of the respondents at most is in the category of late adolescence with a range of 15-19 years old, with total of 28 respondents (58.3%). Most respondents were female with total of 45 respondents (93.8%). The current education level at the most is diploma with 32 respondents (66.7%).

The results showed that before receiving BLS learning, respondents had poor BLS knowledge with 46.67 ± 20.18 mean score in the control group and 45.63 ± 9.59 in the experiment group. Before receiving BLS learning, the majority of respondents gave incorrect answers in questions about handling cardiac arrest cases. Lack of knowledge about BLS, especially on the topic of handling cardiac arrest can be caused since all respondents have never known about BLS.

The results of data analysis showed that the knowledge of respondents in each group has improved. However, an improvement of higher knowledge was shown in the experiment group with 79.38 ± 9.01 mean score. The analysis results between groups showed p-value = 0.016 (p-value < 0.05) which means that there was a significant difference in the knowledge improvement between groups. The results also provide evidence if learning by using mobile application has a significant influence on the respondents’ knowledge.

Knowledge improvement can occur because the mobile application used in this study provides BLS concept menus that can be learned by students anywhere and anytime. The results of this study were similar with another study conducted in Korea regarding the use of interactive mobile application as one of the learning methods for nursing students. The results of that study showed if significant improvement occurred in the concept of clinical practice knowledge by learning with interactive mobile applications. The significant improvement of clinical practice knowledge in that study was because the interactive mobile application feature provided a 3-dimensional simulations to facilitate education process of nursing clinical practice\(^8\).

Another study discussed the training of Cardiopulmonary Resuscitation (CPR) using mobile application and showed results if the respondents’ knowledge as CPR-bystander had a significant difference in improvement when compared to simulation method. This improvement occurred because the “be a bystander” application in that study provided concept and practical guidelines for implementing CPR\(^9\). The previously mentioned study has similar results with this study that is the presence of significant improvement of BLS knowledge in the mobile application group. In this study, besides providing concept and guideline for implementing BLS, it is also completed with exam menus. In the exam menus, students could find out their learning outcomes directly to evaluate how much knowledge they have.
Knowledge can improve through various approaches in a learning process. This study choose a technology approach based on multimedia support that is mobile application. Cognitive theory in multimedia-based learning stated that someone can learn more when information is presented through more than one media, for example a combination of words and images. It was because information processing was received through various ways such as auditory and visual, so learning with more than one media could make the learning process more profound and the information absorbed could be long stored in memory. The use of more than one media could also ease the processing of information to be received by brain\(^{(10)}\).

Learning through electronic devices such as mobile application are a trend in digital learning field today. Digital learning is one of the most significant developments in education field. Learning with mobile application offers several advantages and benefits. The flexibility provided through mobile application learning is one of its advantages and benefits. The flexibility means that students can learn anytime as they want and can be accessed unlimitedly each day\(^{(11)}\).

The use of mobile application also provides an opportunity to make learning process more accessible\(^{(12)}\). This method is more interesting and makes learning process more enjoyable compared to traditional methods that are routinely carried out in the classroom with the lecturer or speaker as the center of attention. Learning method with mobile application can be carried wherever students go and can be done by students in their leisure or desired times\(^{(13)}\).

Learning with mobile application is not focused on the technology aspects, but focused on students. Students with various activities and keep moving around are the center of the learning process, and technology as the support that will enable students to learn in any context, anywhere, and anytime. Another advantage is students do not need to carry heavy burdens such as books or laptops to start learning\(^{(14)}\).

“Life saving: Learning and Guideline” is an android-based mobile application that is used as a BLS learning method in this study. This mobile application has characteristics that are not much different from previous studies that also used technology as learning method. The characteristics of this application include text, images, and sounds. The exam menus and location map are the additional and novelty things offered in this mobile application. The exam menus will support students to evaluate their own learning outcome so they can measure independently their knowledge improvement. The location map menu is provided to help students or users to access the nearest Emergency Medical Service (EMS) to the location of the victim with emergency conditions discovered. The features presented in this mobile application can ease students to learn about BLS in accordance to the advantages and benefits offered through learning by using mobile application. It also can produce good stimulus and ultimately able to improve the knowledge and cognitive abilities of students.

BLS learning or training is an effort that has the potential to provide additional insight to anyone who in certain situations will act as a bystander, one of them are nursing students. Bystanders must have awareness regarding the importance of having knowledge and skills in implementing BLS to be able to maintain one’s life. BLS knowledge and abilities will be able to reduce morbidity and mortality due to life threatening conditions such as cardiac arrest and choking. The use of technology as BLS learning or training offers greater effectiveness and flexibility than traditional methods. Mobile application with its advantages is one of the good learning methods in an effort to improve the knowledge of bystander regarding BLS.

**Conclusions**

BLS learning to nursing students by using mobile application can give significant influence in improving knowledge. The use of mobile application as BLS learning method provides greater flexibility and effectiveness compared to traditional learning method.

**Conflict of Interest:** There is no conflict of interest in this study.

**Source of Funding:** Funding in this study as a whole is accounted on the researcher independently. There are no other funding sources.

**References**


ITGB2 (CD18) mRNA Expression in Hirschsprung-Associated Enterocolitis (HAEC)

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¹Division of Pediatric Surgery, Departement of Surgery, Faculty of Medicine, Hasanuddin University, ²Departement of Surgery, Faculty of Medicine, Hasanuddin University, ³Post Graduate of Medical Science, Faculty of Medicine, University of Hasanuddin, Makassar, Indonesia

Abstract

Background: HAEC is a condition of inflammatory bowel which has clinical characteristics such as fever, abdominal distension, diarrhea, foul-smelling stools and sepsis. At Hirschsprung Disease autopsy that has HAEC, crypt abscesses, mucous ulcerations, and transmural necrosis are seen. In the pathogenesis of inflammatory bowel disease, intestinal flora may also play a key role in the pathogenesis and development of HAEC. CD18 leukocyte disorders and T cell regulation can be associated with genetic predisposition (ITGB2) for HAEC.

Aim: The aim of this study was to investigated the ITGB2 (CD18) mRNA expression in a cohort of patients with Hirschsprung-associated enterocolitis (HAEC)

Method: Screening for ITGB2 (CD18) mRNA expression was performed on DNA extracted from colonic tissue samples of 30 HAEC patients from the Makassar, South Sulawesi, Indonesia population. Polymerase chain reaction amplification was performed, followed by heteroduplex single-strand conformation primer analysis and bidirectional semiautomated DNA sequencing analysis.

Results: From 30 HAEC patients; 25 (83.3%) male patients, 5 (16.7%) female patients. 13 (43.3%), aged ≤ 1 year, 3 (10.0%) aged 4-5 years. The value (p-value <α) or (0.038<0.05) can be concluded that there is a relationship between ITGB2 mRNA expression (CD18) and Genesis HAEC, it can be concluded that the lower the ITGB2 mRNA expression (CD18) then the HAEC event will be increase.

Conclusions: There is a relationship between ITGB2(CD18) mRNA expression and the occurrence of HAEC, the lower of ITGB2(CD18) mRNA expression, the higher histopathological severity degree of HAEC.

Keywords: Hirschsprung’s-associated enterocolitis (HAEC), mRNAITGB2(CD18), Hirschsprung’s disease.

Introduction

Hirschsprung-Associated Enterocolitis (HAEC) was first known at the end of the 19th century by Harald Hirschsprung who also described congenital megacolon. HAEC is a condition of inflammatory bowel which has clinical characteristics such as fever, abdominal distension, diarrhea, foul-smelling stools and sepsis. At Hirschsprung Disease autopsy that has HAEC, crypt abscesses, mucous ulcerations, and transmural necrosis are seen.

Although couples of aetiologies have emerged, the biological mechanisms underlying HAEC are still poorly understood. HAEC is the cause of morbidity and mortality of Hirschsprung sufferers. The incidence of HAEC around the world ranges from 6% to 58%. While the mortality rate at HAEC is still quite high from 6% to 30%. The non-specific clinical manifestations of HAEC cause frequent diagnosis of gastroenteritis, so the diagnosis of HAEC is missed or late.
At present, the pathogenesis of HAEC is still unclear. Recent studies have shown that injuries to the intestinal mucosal barrier, abnormal immune responses in the intestinal tract and infections due to certain pathogens may play an important role in the pathogenesis of HAEC. Enteric pathogens can attack the bloodstream through damaged intestinal mucosal barrier and then induce an inflammatory response such as a waterfall. In addition, histology and immunological studies show that persistent inflammation and decreased immune function in the intestinal tract of the baby causes repeated HAEC. In the pathogenesis of inflammatory bowel disease, intestinal flora may also play a key role in the pathogenesis and development of HAEC.

Zhi Cheng reports that from a HAEC trial in mice, it shows genetic deficiency of endothelin B receptor images, abnormal immunophenotypes characterized by small lymph size, lymphopenia in B and T cells, and abnormal images from colon histopathology occur.

Sam reports that CD18 leukocyte disorders and T cell regulation can be associated with genetic predisposition (ITGB2) for HAEC. This allows a genetic link for the selection of HAEC patients, by identifying the potential molecular targets.

Research Objectives

This study aims to determine the relationship of ITGB2 (CD18) mRNA expression to the occurrence of HAEC in Hirschsprung patients.

Research Methods

The design of this study was a cross sectional study with simple random sampling in patients of Hirschsprung Disease to determine the relationship of ITGB2 (CD18) mRNA expression to the occurrence of HAEC. Colon preparations of Hirschsprung Disease patients were assessed histopathologically according to HAEC severity that is based on the classification of Teitelbeum. RNA extraction uses the Boom method. The quality test of mRNA was using fluorometer, and quantification of the ITGB2 (CD18) gene mRNA was using RT-PCR.

Data Analysis

Statistical analysis of the data was using the Spearman Rank test, the conclusion for the statistical analysis test based on the significance value of \( p \), if the value of \( p < 0.05 \) then the research hypothesis is accepted.

The researcher used the SPSS version 23 computer program for Windows.

Research Result

<table>
<thead>
<tr>
<th>Table 1: Characteristics of Patients by Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
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<tr>
<td>Female</td>
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<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Characteristics of Patients by Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>≤ 1 year</td>
</tr>
<tr>
<td>2 - 3 years old</td>
</tr>
<tr>
<td>4 - 5 years old</td>
</tr>
<tr>
<td>&gt; 5 years old</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3: Description of HAEC Degree Frequency Distribution</th>
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</thead>
<tbody>
<tr>
<td>Degree</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>III</td>
</tr>
<tr>
<td>IV</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Table 4: The Mean Score of ITGB2 (CD18) mRNA in HAEC sufferers

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRNA ITGB2(CD18)2</td>
<td>11.037 ± 1.229</td>
</tr>
</tbody>
</table>

Table 5: Frequency Distribution of HAEC sufferers based on ITGB2 mRNA expression (CD18)

<table>
<thead>
<tr>
<th>mRNA ITGB2(CD18) Expression</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>Low</td>
<td>18</td>
<td>60.0</td>
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<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6: Relationship of ITGB2 (CD18) mRNA Expressions with HAEC Events

<table>
<thead>
<tr>
<th>Correlations</th>
<th>ITGB2(CD18)</th>
<th>Derajat HAEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman’s rho</td>
<td>Correlation Coefficient</td>
<td>.348*</td>
</tr>
<tr>
<td></td>
<td>Sig. (1-tailed)</td>
<td>.032</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
<tr>
<td>HAEC Degree</td>
<td>Correlation Coefficient</td>
<td>.348*</td>
</tr>
<tr>
<td></td>
<td>Sig. (1-tailed)</td>
<td>.032</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (1-tailed).

Source: Calculation Results of SPSS 23.0, 2018

Discussion

From this study, the data obtained showed that there were more male than female, that is 25 (83.3%) compared to 5 (16.7%). Similar to the study of Philip et al. (2018) who also reported in his study that of 116 HAEC sufferers, 99 (85.34%) of them were male and the remaining 17 (14.66%) were female. Likewise the research conducted by Joseph et al. out of 110 sufferers, the ratio of male to female was 3.6:1.

From the description of the age of HAEC sufferers found in this study, most were under 1 year old of age (13 children or 43.3%) and only 4 or 13.3% who were over 5 years old.

Philip K et al. reported that failure to recognize Hirschsprung Disease in the initial prenatal period could place children at greater risk for HAEC, they get 18% - 50% experiencing HAEC in the pre-operative period. Surana et al also reported that the incidence of HAEC in infants was higher in the first week of life (24% were diagnosed with Hirschsprung Disease) compared to those diagnosed more than the first week (11% were diagnosed). In addition, the delay of meconium also affects the occurrence of HAEC (53 hours : 44 hours). Delayed diagnosis of Hirschsprung Disease also affects the occurrence of HAEC in children (16.6 : 4.6 days).

The results of this study found that the highest degree of HAEC was histopathology II and IV (cryptitis or abscesses of two crypts and fibrinopulent debris and mucosal ulceration) each constituted 7 patients or 23.3%. While the fewest were patients with histopathological degrees 0 and V (there were no abnormalities and transluminal or perforated necrosis), which were 2 patients or 6.7% each. The high pathological score of HAEC from all three segments increases the risk of enterocolitis. The high pathological degree in the
transitional segment is significant for postoperative HAEC events.\textsuperscript{9}

Teitelbaum et al. reported that 88% of patients with HAEC III degree and above, and 83% without HAEC with II grade and lower. They use the degree of enterocolitis in patients with Hirschsprung Disease to predict the development of HAEC after definitive pull-through surgery for III degree and above.

Clinical assessment of the degree of enterocolitis may prove to be a useful method for early detection of infants at risk of HAEC. There was a significant change in intestinal mucin with an increase in neutral mucin and a decrease in sulfomucin acids identified in HAEC tissue specimens. The organisms attached to enterocytes are seen in 39% of HAEC tissue specimens.\textsuperscript{10}

The results of this study found that the mean of ITGB2 (CD18) mRNA in HAEC patients was 11,037 and SD was 1,229. The description of HAEC sufferers based on ITGB2(CD18) mRNA expression, as many as 18 children or (60.0%) were patients with low ITGB2(CD18) mRNA expressions and the remaining 12 children (40.0%) were patients with high ITGB2(CD18) mRNA expression. From the correlation coefficient, the value obtained was (p-value <\textalpha) or (0.038 <0.05) so it can be concluded that there is a relationship between ITGB2(CD18) mRNA expression and the incidence of HAEC, the lower the ITGB2(CD18) mRNA expression, the higher number of HAEC occurrence. The lower the ITGB2(CD18) mRNA expression, the higher the degree of histopathology in HAEC patients.

Proinflammatory cytokines also trigger the production of local chemokines which will deliver leukocytes from the circulation to the location where PAMPs or DAMPs are located, to carry out its effector function. The leukocyte effector function is to kill pathogens and to clean tissue from dead cells. The entry of many neutrophils into the tissues is a sign of acute inflammation. Whereas chronic inflammation that may appear later is dominated by the deposition of monocytes and lymphocytes into the inflammatory area.\textsuperscript{11}

After leukocytes meet with inflammatory agents and the remains of dead tissue, the neutrophils and macrophages will actively eliminate them by phagocytosis. To carry out this function, on the surface of phagocytes there are a number of receptors and other molecules used to carry out their functions. Cytokine and chemokine receptors in menbran phagocytes are triggered by cytokines for the production of ROS, NO and lysozyme and inflammatory mediators (metabolism of arahidonic acid and cytokines) for amplification of the immune response.

The presence of leukocyte-1 adhesion deficiency will occur in the leukocyte system, the recruitment of granulocytes which is not effective in responding to bacterial invasion, which ultimately results in recurrent bacterial infections. This is what causes the increased incidence of HAEC and the severity of HAEC in patients with Hirschsprung Disease.

Chronic inflammation can arise from acute inflammation that does not heal or indeed a chronic inflammation from the beginning (not preceded by acute inflammation), for example chronic inflammation that occurs in fat tissue. Acute inflammation that does not heal is usually caused by: failure of neutrophils to eliminate pathogens, the presence of foreign elements, autoimmune diseases and unclear causes.

The same was reported by Moore et al. that variations in ITGB2(CD18) gene immunomodulatory (CD18) were found in 66% of patients with Hirschsprung Disease, and 59% of these patients suffered HAEC. More than one variation of the ITGB2(CD18) gene is associated with more severe HAEC. Further research on genetic variation in HAEC may explain its pathogenesis.\textsuperscript{12}

Chronic inflammation mediated by immune diseases (eg. Rheumatoid arthritis (RA)), psoriasis, multiple sclerosis, and inflammatory bowel disease (IBD) are characterized by the recruitment of unregulated leukocytes. Neutrophils, which are short-lived outside the circulation, migrate to the site of inflammation and undergo apoptosis, while monocytes remain in inflamed tissue for several days, where other monocytes become permanent occupants. The leukocytes migrate to the site of inflammation throughout the walls of post-capillary venules by involving specific molecules expressed on special endothelial cells. Endothelial molecules function as mechanical anchors and to provide network specificity for the recruitment process.\textsuperscript{13}

The type of \textbeta subunit which is present in each heterodimer defines a discrete integrin subtype, which displays a unique pattern of structure, network specificity, and function. The integrin families \textbeta2, \textalpha 4 and \textbeta 7 play the most prominent roles during immunological and
inflammatory conditions, because they are leukocyte-specific. The β2/CD18 integrins combine with different α chain ligands to produce four β2-heterodimers. Their cellular distribution varies between different heterodimers and several such as CD11c which is now generally seen as a monocyte lineage cell marker. Essential information for the functional importance of β2 integrins is obtained from clinical and immunological phenotypic studies of mice or humans that contain mutations of each gene. In particular, lymphocytes and neutrophils mainly express CD11a/CD18 (LFA-1). LFA-1 binds to ICAM-1 and ICAM-2 which is expressed in endothelial cells and mediates migration, antigen presentation, and cell proliferation.

Recent genetic studies explain the important role of CD18 integrins in innate immunity. Where, 26 human and 21 rats, carry zero or hypomorphic mutations in the ITGB2 (CD18) gene (which encodes the β2 (CD18) integrin subunit) resulting in genetic abnormalities of leukocyte-1 (LAD-1) adhesion deficiency. This condition is characterized by recurrent bacterial infections. The pathophysiological disorder underlying the clinical phenotype is the recruitment of granulocytes that are ineffective in responding to bacterial invasion.

Intestinal-related lymphoid tissue, gut-associated lymphoid tissue (GALT) is the largest lymphoid organ in the body and is responsible for protecting against various antigens that may enter the body, including food particles, pathogenic bacteria and their toxins. Peyer’s patches (PP) are the main inductive for intestinal mucosal immunity. PP is a collection of immune cells, follicles that are similar to lymph nodes and are located along the intestinal anti-mesenteric surface. In circulation, T-naive lymphocytes and B-lymphocytes, α4β7 integrins and L-selectin, migrate from PP through binding of MADCAM-1 (mucous cell 1 cell addressin adhesion molecules), which is expressed in high endothelial venules in PP. Above the PP mucosa contains M cells, a special epithelium for transporting antigens from the intestinal lumen to PP, which is presented for naive lymphocytes, such as dendritic cells (DC). Activated lymphocytes then enter efferent lymphatic channels to travel to “mesenteric lymph nodes” (MLN). From MLN, activated lymphocytes travel through the thoracic duct into the systemic circulation. The travel of activated lymphocytes to the lamina propria (LP), through the main effectors of mucosal immunity, occurs through coordinated action of a number of cellular adhesion molecules, cytokines and chemokines. After being in LP, T lymphocytes produce Th-2 cytokines pro-inflammatory interleukin-4 (IL-4) and pro-inflammatory IL-10 to stimulate the production of immunoglobulin A (IgA) with terminal differentiated B lymphocytes, called plasma cells. IgA, the most widely immunoglobulin isotype produced in the body, is then actively transported to the mucosal surface in the form of dimers by polymer immunoglobulin receptor (pIgR).

In addition, they also observed a decrease in marginal zone B lymphocytes, suggesting impaired development of B lymphocytes. Both groups showed changes in lymphocyte population, similar to those experiencing stress (such as HAEC). In an effort to describe the contribution of the EdnrB -/- genotype to the HAEC phenotype, Frykman, et al. performed bone marrow transplantation from EdnrB -/- animals to Rag2 recipients -/- and, separately, induced intestinal obstruction in experimental animals. They concluded that stress due to obstruction produced lymphocyte changes seen in the HAEC model. In addition, in the EdnrB -/- model, animals undergoing surgery and continuous intestinal blockages will have a 40% risk of HAEC.

Conclusion

There is a relationship between ITGB2(CD18) mRNA expression and the occurrence of HAEC, the lower of ITGB2(CD18) mRNA expression, the higher histopathological severity degree of HAEC.

Ethical Clearance- Taken from Medical faculty ethical clearance committee.

Source of Funding- Self

Conflict of Interest – None

References


Urinary α-Amylase Level in Patients with Hypertension

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Al-Bayan University / College of pharmacy, Baghdad –Iraq

Abstract

Background: Amylase is a digestive enzyme which is secreted from salivary gland and pancreas; it cleaves cooked starch in the mouth, cooked and uncooked starch in the upper part of intestine mainly in jejunum. The final product of digestion is three glucose units then to glucose monosaccharide.

There are 3 types of amylase enzymes which are: (α, β & γ) Amylase.

The renal clearance of amylase enzyme ranges from 1 to 3 mL/min.

Hypertension is an increase in the force which the blood places on blood vessels as it moves through the body. Hypertension in most of cases is clinically asymptomatic but it is one of the risk factors for cardiovascular disease and causes progressive damage to kidney in a long term process which leads to excessive excretion of low molecular weight compounds like albumin and amylase in urine.

Objectives: Assay of alpha urinary amylase level and using it as a better reliable indicator for glomerular damage.

Patients and Method: Our study is based on measuring the absorbance for samples by using spectrophotometer device; we collect 92 urine samples from different hypertensive patients, and then calculate the concentration of amylase level by using fixed rate colorimetric method:

\[
\Delta E = A_2 - A_1
\]

Alpha amylase (U/L) = \(\Delta E \times 765\)

Results: approximately all samples show an increase in amylase enzyme level above 450U/L.

Conclusion: Amylase can serve as a better indicator of glomerular damage.

Keywords: Amylase, starch, renal clearance, Hypertension, glomerular function.

Introduction

Amylase Enzyme

Amylase is a digestive enzyme that normally acts extracellularly to cleave starch into smaller carbohydrate groups and, finally, into monosaccharides, by hydrolysis of internal alpha-(1→4) glycoside bonds, which results in the production of maltose, dextrine and oligosaccharides. Among healthy individuals, the pancreas and the salivary glands account for almost all serum amylase, 40-45% from the pancreas and 55-60% from the salivary glands.\(^1\)

Types of Amylase:

1. α
2. β
3. γ
The renal clearance of amylase has been shown to range from 1 to 3 mL/min and is constant over a wide range of urine flow. Increased blood levels of amylase are followed by increased excretion into the urine. It has been shown that this increase in excretion in pancreatitis is further enhanced by an increased renal clearance rate of amylase. Determination of the enzyme activity is done by measuring the reducing sugars released as a result of the action of α-Amylase on starch.

Another method is to measure the extent of hydrolysis by reading absorbance of 2-chloro-4-nitrophenol (CNP).

The reference range of amylase is as follow: 3

- Serum test: Normal is 40-140 U/L
- Urine Test: Normal is 24-400 U/L

Hypertension:

Blood pressure is the force of blood pushing against blood vessel walls as the heart pumps out blood, and high blood pressure, also called hypertension, is an increase in the amount of force that blood places on blood vessels as it moves through the body. Factors that can increase this force include higher blood volume due to extra fluid in the blood and blood vessels that are narrow, stiff, or clogged. Hypertension in most cases is clinically asymptomatic but it is one of the risk factors for cardiovascular disease and causes progressive damage to kidney in a long term process. Hypertension impairs glomerular function and also leads to subclinical atherogenesis, there is an excretion of low molecular weight compounds like albumin and amylase in urine.

Renal hypertension can cause chronic kidney disease. This is a slow decline in kidney function. Until the condition is well advanced, chronic kidney disease also causes no symptoms. Because there are usually no symptoms, a doctor may suspect renal hypertension when someone has uncontrolled high blood pressure despite multiple medications or has unexplained chronic kidney disease.

Macroamylasaemia:

In some patients, high plasma amylase activity is due to low renal excretion of a macroenzyme form, despite normal glomerular function. The condition is symptomless and it is thought that the enzyme is bound to IgA, giving a complex of molecular weight about 270 kDa. If amylase and creatinine are assayed in simultaneous plasma and urine samples, an amylase clearance to creatinine clearance ratio can be calculated. If the result is multiplied by 100, a ratio of less than 0.02 is suggestive of macroamylasaemia.

Electrophoretic techniques can also be used to determine the presence of macroamylasaemia.

This study was conducted to analyze the changes in amylase levels in hypertension.

Materials and Method

The device we used for measuring absorbance is spectrophotometry

- Working equipment includes:
- Laboratory water bath
- Cuvette
- Micropipette
- Test tubes
- Urine test containers
- Gloves
- Alpha Amylase kit.

The study was conducted from Baghdad Teaching Hospital. Ninety two urine samples was collected from 92 patients with hypertension, samples are collected under certain conditions, including stocked and stored in refrigerators under a temperature between 4 to 8°C and duration of storage does not exceed 24 hours.

Method: (fixed rate colorimetric method)

Procedure:

- Wave length = 405 nm
- Light path = 1 cm
- Temperature = 37°C
- Reagent Blank = Against distilled water
- Reaction = Fixed rate

Allow reagents to reach working temperature before use.
1. Take (25 µL) of each sample and mix well with (1000 µL) of reagent.

2. Incubate for 1 minute at 37°C then read the absorbance A1.

3. After exactly 4 minutes later read the absorbance A2. [7, 8, 9]

Calculation:

\[ \Delta E = A2 - A1 \]

Alpha amylase (U/L) = \( \Delta E \times 765 \)

Results & Calculations

Statistics:

<table>
<thead>
<tr>
<th>BMI Categories</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
</tr>
</tbody>
</table>

Table (1) - Demographic history of 92 patients and 60 controls

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>92</td>
<td>54.34</td>
<td>1.83</td>
<td>15.28</td>
<td>32.00</td>
<td>78.00</td>
</tr>
<tr>
<td>Conc.</td>
<td>92</td>
<td>637.27</td>
<td>26.10</td>
<td>216.82</td>
<td>91.80</td>
<td>1116.9</td>
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<tr>
<td>BMI</td>
<td>92</td>
<td>0.27</td>
<td>0.006</td>
<td>0.05</td>
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<td>0.41</td>
</tr>
<tr>
<td>Age</td>
<td>60</td>
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<td>2.34</td>
<td>12.28</td>
<td>30.00</td>
<td>72.00</td>
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<td>Conc.</td>
<td>60</td>
<td>353.73</td>
<td>26.10</td>
<td>22.82</td>
<td>88.80</td>
<td>410.00</td>
</tr>
<tr>
<td>BMI</td>
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<td>0.008</td>
<td>0.04</td>
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<td>0.31</td>
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</table>

Table (2) - Describe amylase level of patients and controls according to Age and BMI

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>No. of observations</th>
<th>Mean ±SE</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤40 Healthy</td>
<td>32</td>
<td>367.01±11.32</td>
<td>0.01</td>
</tr>
<tr>
<td>40&lt; Healthy</td>
<td>28</td>
<td>390.12±18.55</td>
<td></td>
</tr>
<tr>
<td>≤40 Patient</td>
<td>24</td>
<td>669.78±19.45</td>
<td></td>
</tr>
<tr>
<td>40&lt; Patient</td>
<td>68</td>
<td>786.77±34.26</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BMI Groups</th>
<th>No. of observations</th>
<th>Mean ±SE</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤0.24 Healthy</td>
<td>24</td>
<td>344.23±26.87</td>
<td>0.01</td>
</tr>
<tr>
<td>0.25 – 0.29 Healthy</td>
<td>20</td>
<td>350.30±37.12</td>
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</tr>
<tr>
<td>0.30≤ Healthy</td>
<td>16</td>
<td>372.28±44.84</td>
<td></td>
</tr>
<tr>
<td>≤0.24 Patient</td>
<td>28</td>
<td>570.47±33.71</td>
<td></td>
</tr>
<tr>
<td>0.25 – 0.29 Patient</td>
<td>32</td>
<td>703.80±42.24</td>
<td></td>
</tr>
<tr>
<td>0.30≤ Patient</td>
<td>32</td>
<td>629.21±52.69</td>
<td></td>
</tr>
</tbody>
</table>

Normal weight = 18.5–24.9
Overweight = 25–29.9
Obesity = BMI of 30 or greater

Statistical analysis:

Data were analyzed by using SPSS software version 22 and Microsoft Office Excel (Microsoft Office Excel for windows; 2010). The data subjected to One Way ANOVA and means were compared by least significant differences (LSD).

References


Figure (1) - Compare amylase levels between patients and controls according to BMI

Figure (1) show significant positive correlation between amylase level in hypertensive patients and BMI than controls.

Figure (2) - Correlation between amylase level and Smoking

Figure (2) show significant correlation between smoking and amylase level in hypertensive patients.

Figure (3) - Correlation between amylase level and Gender

Figure (3) show a higher amylase level in female than male in patients.

Figure (4) - Correlation between amylase level and Age

Figure (4) show positive significant correlation between amylase level and age.

Discussion and Conclusion

Hypertension has been shown to accelerate atherogenesis in animals, and because of this damaging impact of subclinical atherogenesis, glomeruli becomes dysfunctional and there is excretion of low molecular weight compound like albumin in urine. Amylase another low molecular weight substance is cleared through kidney. Our study shows significant increase in urinary amylase levels in patients with uncontrolled diabetes which are in parallel to other studies.

Amylase has a molecular weight of 55,000 k dalton which is less than the molecular weight of albumin (74,000 k dalton). Mostly the filtered amylase and albumin are re-absorbed by the tubular cells. In the case of amylase only about 45% of the filtered molecules are reabsorbed, whereas more than 90% of the filtered amount of albumin is reabsorbed by the tubular cells. Serum Albumin can therefore not serve as a reliable marker of glomerular damage. On the other hand amylase because of less variability in serum by common disorders plus less efficient reabsorption of filtered amylase by tubules can serve as a better indicator of glomerular damage.

The change in amylase was much significant (p value 0.01 ). Some authors have proposed that hypertension may increase capillary pressure, and acute elevation in systemic perfusion pressure may accelerate hyperfiltration, and these events lead to damage to kidney. The damage to the kidney is reflected in the increased excretion of low molecular weight substances like albumin and amylase.

Ethical Clearance- Al-Bayan University

Source of Funding- Self

Conflict of Interest – None

References
3. Lorentz, K. A -Amylase assay: Current state


Serum Levels of IL-12 Family in Hepatitis Patients with HBV and HCV Infections

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²Ministry of Science and Technology, Baghdad-Iraq

Abstract

Hepatitis is inflammation of the liver, with hepatitis, the liver not working well. Viruses one of the most causes of hepatitis in the world. Cytokines are small proteins produced by cells have a specific interaction effect on the connection between the component of the immune system. Therefore, the present study aimed to investigate the serum level of the interleukin-12 family is a unique cytokines in comprising the heterodimeric, includes (interleukin-12, interleukin-23, interleukin-27, and interleukin-35). All investigated cytokines (IL-12, IL-23, IL-27, and IL-35) showed significant variations. Serum level of interleukin-12 and interleukin-23 showed a significant difference in viral hepatitis patients compared to controls according to age group. Distribution patients and controls into males and females revealed some significant differences in the serum level of the interleukin-12, interleukin-27, and interleukin-35.

Keyword: serum level, IL-12 family, HBV, HCV, Iraqi Patients

Introduction

Hepatitis is liver inflammation. Viral hepatitis has emerged as a major problem of health throughout the world, affecting many millions of people. Also, considerable morbidity and mortality in the population, and one of the most common causes of hepatitis in the worldwide.

Five main viral hepatitis referred to as types A, B, C, D, and E. These type’s hepatitis B virus (HBV) and hepatitis C virus (HCV) together, are the most common cause of liver illness, cirrhosis, and cancer.

IL-12 is mainly produced by dendritic cells (DC) and B lymphoblastic cells stimulated by antigen and macrophages, and cytotoxic effects of NK cells by inducing interferon gamma (IFN-γ) expression, and it is an essential mediator of resistance to bacterial and viral infections, treatment of malignant tumors and occurrence some of the infectious diseases. IL-23 is secreted mainly by activating macrophage cells and dendritic cells (DC). The similarity between IL-12 and IL-23 can also stimulate IFN-γ and T-lymphocyte cell proliferation.

IL-27 is mainly produced by antigen-presenting cells (APCs), such as activated dendritic cells (DC), monocytes and their receptors, and expressed in the lymphocytes, thymus and spleen especially on surfaces of CD4+ T cells and NK cells.

IL-35 is a negative regulated immune factor playing a critical role in inhibiting proliferation of effector T-lymphocyte cells and Th17 cell differentiation.

IL-12 and IL-23 act mainly as pro-inflammatory. In contrast, both IL-27 and IL-35 act primarily as anti-inflammatory cytokines. IL-39 is stimulates neutrophil differentiation thereby is involved in promoting inflammation. There is some identical and non-identical function among IL-12 family members which make them a novel bridge between immune system branch (innate and adaptive).

The balance between viral infection and host defense defines as the course of infection and pathogenesis, with persistent viruses such as HBV and HCV, are generally

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not directly cytopathic effect and have developed immune mechanisms of evasion to survive without damaging the host \(^{(12)}\). The goal of hosts is prevented, eliminate, or at least control viral infection while limiting undue collateral destroy \(^{(13)}\). Therefore, this study was planned to estimation the role of IL-12 family in the etiopathogenesis of HBV and HCV in terms of serum level.

**Material and Method**

**Subjects**

This study was extended from June 2017 to May 2018. The present case-control study was conducted at the GHTH in Baghdad after obtaining the approval of the Ethics Committee at the Iraqi Ministry of Health. The consultant medical staff was diagnosed subjects, which was based on clinical, and serology test by ELISA, in addition, was confirmed by molecular method real-time PCR. 10 ml were drawn and distributed into 2 plain tubes. The serum tested by ELISA method to detect anti-viral (HBV and HCV) antibodies (Biomerieux HBs Ag HBV kit; France), and if it was positive, the diagnosis was confirmed further by real-time PCR analysis to detect the viral genetic material (COBAS® AmpliPrep/COBAS® TaqMan® HBV and COBAS® AmpliPrep/COBAS® TaqMan® HCV kits; USA), in addition all patients were firstly diagnosed and none of them was under treatment, in addition, the chronic patients were excluded. Two hundred subjects, 154 of them were suffering from acute viral hepatitis and were classified into two groups: **The group I:** 76 patients with acute HBV, mean ± SD: (43.37 ± 10.67) years. **The group II:** 76 patients with acute HCV, mean ± SD: (33.63 ± 15.35) years. **The group III:** 48 controls mean ± SD: (39.20 ± 11.32) years. The controls were blood donors and their laboratory profile in the CBB (Central Blood Bank-Baghdad) revealed that they were negative for Hepatitis B and C viral infections.

**Assessment of IL-12 family Serum Levels**

Acute hepatitis sera of patients and controls were assessed for level of IL-12, IL-23, IL-27, and IL-35 using commercially available kits (PeproTech; UK) by means of ELISA that was based on similar principles.

**Statistical Analysis**

Serum level of these interleukins was given as mean ± SD, and significant differences between means were assessed ANONA (Analysis of Variance) followed by either Duncan or LSD (Least Significant Test) using the software SPSS version 13.

**Results and Discussions**

**Total serum Level of the IL-12 family**

Acute hepatitis patients (HBV, HCV) showed a significantly increased level of all interleukins compared to control table (1).

**Patients Distributed by Age and Gender**

Out of the Four investigated interleukins (IL-12, IL-23, IL-27, and IL-35), all of these showed significant variations. Serum level of IL-12 was significantly increased in HBV and HCV patients with controls according to age group (35.22 ± 10.44; 32.46 ± 11.40 vs. 18.16 ± 12.8 pg/mL) respectively. IL-23 serum level was also significantly increased in (HBV) and (HCV) patients compared controls (41.32 ± 11.69; 39.47 ± 14.45 vs. 24.38 ± 11.28 pg/mL) and (39.13 ± 18.17; 35.24 ± 10.71 vs. 30.33 ± 10.42 pg/mL) in the age groups (< 40 and ≥ 40 years) respectively, while IL-27 level showed no significant among patients compared to controls in the age groups (< 40) years, while showed significantly increased in age groups (≥ 40) years. Finally, IL-35 serum level showed significant differences in (HBV) and (HCV) patients in both age groups (< 40 and ≥ 40 years), compared to controls (30.33 ± 11.19; 48.41 ± 8.09 vs. 28.16 ± 10.98 pg/mL) and (39.23 ± 12.38; 33.31 ± 11.71 vs. 18.31 ± 8.22 pg/mL) as shown in the table (1,2,3,4).

Distribution patients and controls into males and females revealed some significant differences in the serum level of the IL-12, IL-27, and IL-35. Females hepatitis patients HBV, HCV showed no significant differences compared with controls in the level of IL-23 (42.73 ± 16.35; 39.33 ± 15.23 vs. 37.22 ± 12.02 pg/mL) (table 1,2,3,4).

These findings came to be consistent with the pro-inflammatory role of IL-12 in host defense mechanism against intracellular pathogens; including HBV and HCV \(^{(14,15)}\). Such cytokine has been demonstrated to suppress the replication of HBV and promotes its eradication via the pathway of stimulating HBV-specific cytotoxic T-cell response, and role of these interleukins in viral clearance is produced in response to viral infection \(^{(16,17,18)}\).

Such results may have suggested that the age
is not critical factor that affects the serum level of the investigated cytokine; however, caution must be considered in explaining these results because the specimen size in patients and controls may not permit a firm conclusion. In addition, age can be considered an affected factor when we have subjects at age more than 60 years, because it is often that a dysregulation in the immune functions, and a health decline and increased sensitivity to different diseases are associated with age people, for this reason, cytokines act a central immunologic communication, age-associated changes in cytokine production may contribute to these changes \(^{(19)}\). However, in agreement with present findings, Kim et al. (2011) showed that serum levels of IL-2, IL-12, IFN-γ, and TNF-α showed no significant differences between two age groups of healthy subjects (< 40 and ≤ 65 years) \(^{(20)}\). In addition, Kleiner et al. (2013) found that some interleukins show differences between young children and adults \(^{(21)}\). Finally, Goetzl et al. (2010) reported that the production of IFN-γ and IL-17 by eliciting T-lymphocyte cells were higher or minimally varied for healthy older female as compared with young females \(^{(22)}\).

Some studies have shown a correlation between cytokine serum levels and gender, and this may have been influenced by various factors, and among them is the hormonal status \(^{(23)}\). In this regard, immune defense capacity has shown differences between human males and females. In addition, males are found to be more prone to infections, while females are at greater risk to develop autoimmune diseases. These findings were correlated with humoral responses to the foreign antigenic challenge, and the suggestion was that sex hormones may affect immune functions \(^{(24)}\). With respect to cytokines, Elahe et al. (2006) reported that inflammatory cytokines were variable regulated in response to hepatic infection in male and female mice \(^{(25)}\). Finally, Klingstrom et al. (2008) revealed that the cytokine responses not similar in females and males during viral infection; implying that the subsequent activation and function of immune responses might differ between them upon infection. These findings may explain part of the showed sex differences in infections susceptibility to diseases and in mortality after viral infections \(^{(26)}\).

### Table-1: Total serum level of IL-12, IL-23, IL-27 and IL-35 in total hepatitis B and C patients and controls.

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Cytokine Serum Mean Level ± SD. (pg/ml)</th>
<th>Patients</th>
<th>Controls (No. = 48)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients</td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hepatitis B (No. = 76)</td>
<td>Hepatitis C (No. = 76)</td>
<td></td>
</tr>
<tr>
<td>IL-12</td>
<td>37.65 ± 11.64^A</td>
<td>35.08 ± 11.54^A</td>
<td>25.35 ± 10.50^B</td>
</tr>
<tr>
<td>IL-23</td>
<td>31.32 ± 14.09^A</td>
<td>41.31 ± 15.89^B</td>
<td>18.90 ± 9.49^C</td>
</tr>
<tr>
<td>IL-27</td>
<td>39.90 ± 11.92^A</td>
<td>39.03 ± 12.10^A</td>
<td>21.28 ± 6.10^B</td>
</tr>
<tr>
<td>IL-35</td>
<td>43.96 ± 9.64^A</td>
<td>38.69 ± 13.25^A</td>
<td>22.41 ± 8.09^B</td>
</tr>
</tbody>
</table>

Different superscript letters: Significant difference (P ≤ 0.05) between means of rows.

### Table 2: IL-12 serum level in (HBV), (HCV) patients and controls distributed by age group and gender

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Groups</th>
<th>No.</th>
<th>Cytokine Serum Mean Level ± S.D. (pg/ml)</th>
<th>Patients</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patients</td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hepatitis B</td>
<td>Hepatitis C</td>
<td></td>
</tr>
<tr>
<td>IL-12</td>
<td>&lt; 40</td>
<td>98</td>
<td>35.22 ± 10.44^A</td>
<td>32.46 ± 11.40^A</td>
<td>18.16 ± 12.08^B</td>
</tr>
<tr>
<td></td>
<td>≥ 40</td>
<td>102</td>
<td>31.53 ± 11.08^A</td>
<td>39.77 ± 15.75^B</td>
<td>20.33 ± 8.12^C</td>
</tr>
</tbody>
</table>
Table 3: IL-23 serum level in (HBV), (HCV) patients and controls distributed by age group and gender

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Groups</th>
<th>No.</th>
<th>Patients Serum Mean Level ± S.D. (pg/ml)</th>
<th>Controls Serum Mean Level ± S.D. (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hepatitis B</td>
<td>Hepatitis C</td>
</tr>
<tr>
<td>IL-23</td>
<td>&lt; 40</td>
<td>98</td>
<td>41.32 ± 11.69A</td>
<td>39.47 ± 14.45A</td>
</tr>
<tr>
<td></td>
<td>≥ 40</td>
<td>102</td>
<td>39.13 ± 18.17A</td>
<td>35.24 ± 10.71AB</td>
</tr>
<tr>
<td>P ≤</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>IL-23</td>
<td>Males</td>
<td>82</td>
<td>36.17 ± 10.57A</td>
<td>33.74 ± 10.21A</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>118</td>
<td>42.73 ± 16.35A</td>
<td>39.33 ± 15.23A</td>
</tr>
<tr>
<td>P ≤</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Different superscript letters: Significant difference (P ≤ 0.05) between means of rows.

P: Probability. N.S.: Not significant (p > 0.05)

Table 4: IL-27 serum level in (HBV), (HCV) patients and controls distributed by age group and gender

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Groups</th>
<th>No.</th>
<th>Patients Serum Mean Level ± S.D. (pg/ml)</th>
<th>Controls Serum Mean Level ± S.D. (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hepatitis B</td>
<td>Hepatitis C</td>
</tr>
<tr>
<td>IL-27</td>
<td>&lt; 40</td>
<td>98</td>
<td>37.42 ± 12.19A</td>
<td>36.48 ± 12.49A</td>
</tr>
<tr>
<td></td>
<td>≥ 40</td>
<td>102</td>
<td>39.63 ± 12.39A</td>
<td>41.34 ± 15.27A</td>
</tr>
<tr>
<td>P ≤</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>IL-27</td>
<td>Males</td>
<td>82</td>
<td>32.27 ± 10.29A</td>
<td>37.32 ± 11.23A</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>118</td>
<td>38.61 ± 13.25A</td>
<td>37.84 ± 12.33A</td>
</tr>
<tr>
<td>P ≤</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Different superscript letters: Significant difference (P ≤ 0.05) between means of rows.

P: Probability. N.S.: Not significant (p > 0.05)
Table 5: IL-35 serum level in (HBV), (HCV) patients and controls distributed by age group and gender

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Groups</th>
<th>No.</th>
<th>Cytokine Serum Mean Level ± S.D. (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patients</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hepatitis B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hepatitis C</td>
</tr>
<tr>
<td>IL-35</td>
<td>&lt; 40</td>
<td>98</td>
<td>30.33 ± 11.19^a,c</td>
</tr>
<tr>
<td></td>
<td>≥ 40</td>
<td>102</td>
<td>39.23 ± 12.38^a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28.16 ± 10.98^c</td>
</tr>
<tr>
<td>P ≤</td>
<td>0.05</td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>82</td>
<td>38.27 ± 11.59^a</td>
</tr>
<tr>
<td>IL-35</td>
<td>Females</td>
<td>118</td>
<td>42.13 ± 16.95^a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21.12 ± 10.18^b</td>
</tr>
</tbody>
</table>

Different superscript letters: Significant difference (P ≤ 0.05) between means of rows.

P: Probability. N.S.: Not significant (p > 0.05)

**Conclusion**

Based on the findings, it is possible to reach the following conclusions: the serum profile of IL-12 family was upregulated in hepatitis B and C patients, and the infections were associated with an increased level of these cytokines.

**Source of Funding-** Self

**Ethical Clearance-** Taken from the Ethics Committee at the Iraqi Ministry of Health.

**Conflict of Interest - Nil**

**References**


Analytical Study of Strategic Watch at Paralympic Committee Members in Iraq

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¹University of Baghdad/The college of Physical Education and Sport Sciences/Iraq

Abstract

Research is important in highlighting the concept of strategic vigilance as a modern administrative methods for development and change that can make a quantum leap in performance sports institutions and cadres. Search problem was the instability of the political, economic and social conditions for many years, affecting development capabilities and administrative institutions and particularly strategic decisions, and that reflects on the future of the organization. Which made the Paralympic Committee urgently need to adapt to those changes, to address shortcomings in financial possibilities and raise levels of enterprise performance and achieving adequate progress and achievement athlete who seeks to achieve in international forums, and that only by adopting the methods and modalities diverse management as strategic vigilance system which carries with it change and innovation in the area of administrative work.

Goal of research to analyze the reality of strategic Watch Committee members addressed the Iraqi Paralympic by identifying strengths and weaknesses in strategic watch and its dimensions have Paralympic Committee members in Iraq.

Use a descriptive analytical survey method on the Iraqi National Paralympic Committee members of b (the Executive Office, sports associations, committees in the provinces) and (132) and distributed measurements of strategic watch a sample search, and after collecting Results and addressed the following conclusions reached by researchers:

The strategic vigilance of axes (internal vigilance, technological, competitive vigilance, alertness) got high agreement rates by Paralympic Committee members, an indication of the ability of its members to understand the organizational and technological and competitive environment, environmental Access to success.

Technological Paralympic Committee members help to improve the efficiency of their performance through the use of modern technologies and evolution in the field of sports.

Keywords: Analytical study, strategic and Paralympic Committee.

Introduction

Sports institutions have faced numerous threats because of various changes and technological developments, which made those institutions seeking to keep abreast of these developments and rapid and complex changes and method adaptation. Forcing managers to find new management systems and non-traditional methods are consistent with these variables and environmental developments and handled in a great way. And strategic Watch system which is one of the most effective computer systems what sets high capacity to provide administrative needs of futuristic and realistic information to control and monitor and track workflow and adjust its relationship with the environment that activates and selects the competitors’ strengths and weaknesses And their goals and aspirations and attitudes and their policy and strategy, and in return it knowing what goes into the external environment through her skull, and analysis of opportunities and threats and collect their information processing and delivery in time to make the right choice to succeed and Excel in their performance.
The instability of the political, economic and social conditions for many years until this day impact on the development of capabilities and administrative institutions and particularly strategic decisions, which reflected negatively on the Organization’s future. Which made the Paralympic Committee need administrative departments able to adapt to those changes, to address shortcomings in financial possibilities and raise levels of adequacy of performance and achievement of success helps them achieve progress and achievement athlete who seeks to achieve in the forums International, and it is only by adopting various methods and management methods as strategic vigilance system which carries with it change and innovation in the area of administrative work. So the researchers sought to analyze the reality of strategic Watch Committee members have Paralympic Games.

Here lies the importance of research to highlight the concept of strategic vigilance as a modern administrative methods for development and change that can make a quantum leap in performance level administrators in sports organizations. So the strategic vigilance concept achieves many benefits to members of management in sports organizations to improve decision making, respond quickly to changes in the environment, and improve the efficiency of performance, which prompted the adoption of the concept of strategic watch one of the most important pillars To build future plans and visioning that might improve the adequacy and performance of the enterprise (Paralympic Committee in Iraq) and maintain its competitive position.

**Research aim:**

Analysis of strategic vigilance by identifying strengths and weaknesses in strategic watch and its dimensions have Paralympic Committee members in Iraq.

**Research methodology and field procedures:**

**Research methodology:**

Use a descriptive analytical survey method of research problem to fit it.

**The research community and samples:**

Select search intentional way society of Iraqi National Paralympic Committee members of b (the Executive Office, sports associations, provincial subcommittees) except for the Kurdistan region. And (150 members), as shown in table. (1)

<table>
<thead>
<tr>
<th>S</th>
<th>Paralympic Committee</th>
<th>N</th>
<th>The sub committees</th>
<th>N</th>
<th>Sport federations</th>
<th>N</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Executive Office</td>
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<td>Basra</td>
<td>5</td>
<td>Athletics</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Meyssan</td>
<td>5</td>
<td>Weight lifting</td>
<td>5</td>
<td>10</td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>Dhi Qar</td>
<td>5</td>
<td>Fencing on chairs</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Qadisiya</td>
<td>5</td>
<td>Bow and arrow</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wasit</td>
<td>5</td>
<td>Swimming</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Muthanna</td>
<td>5</td>
<td>Tennis</td>
<td>5</td>
<td>10</td>
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<td></td>
</tr>
<tr>
<td>7</td>
<td>Najaf</td>
<td>5</td>
<td>Volleyball seat</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Karbala</td>
<td>5</td>
<td>Judo for the blind</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Babylon</td>
<td>5</td>
<td>Basketball on chairs</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Salahaddin</td>
<td>5</td>
<td>Shooting</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Anbar</td>
<td>5</td>
<td>Deaf</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Diyala</td>
<td>5</td>
<td>Goal ball</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Kirkuk</td>
<td>5</td>
<td>Albuchia</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mosul</td>
<td>5</td>
<td>Table Tennis</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>10</td>
<td>70</td>
<td>70</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Either the search sample constituted the entire research community and that the proportion of the sample (100%) From the research community, and the research community has been divided over their samples with indiscriminate manner with lots to be each independent sample as follows:

**Pilot study sample:**

Included (10 members) of the Paralympic Committee member of b (Executive Office) (6.66%) Total society, have been excluded from the trial.

**Sample application:**

Included (140 members) of the Paralympic Committee member, (93. 33%) Total society.

**Tools and means used in the search:**

Field visits to gather information.

Arabic and foreign sources and references.

International information network (Internet).

Laptop TOSHIBA.

 Staff Assistant.

 Data dump format.

**Vigilant scale strategy:**

Been using a scale strategic watch containing (28) is drafted in a positive direction and five alternatives to answer (always agree, agree, agree sometimes, rarely agree, disagree) spread over the four axes of the scale are the focus of regulatory vigilance (7) words and technological vigilance (7) axis Competitive vigilance focus words) of (7) and environmental vigilance axis (7) words with great degree of the scale (140) and lower class (28) and Center this speculation to scale (84) degree. Supplement (1) illustrates this.

**Pilot study:**

The mini experience is applied to a small sample of the research community itself under conditions similar to the conditions of the experiment. After obtaining official approvals of the Iraqi National Paralympic Committee with respect to the distribution of forms exploratory experiment was standards with staff assistant on a sample of (10) members of the Paralympic Committee of b (Executive Office date (7-1-2019) for the purpose of creating success when distributing sample scale search and make sure you understand the sample to gauge terms in order to avoid any mistakes or difficulties when applied during the test the President for research and learn about effective alternatives to answer and efficient staff assistant. The researchers found that all the terms were clear and understandable to the exploratory test sample.

**Main experience:**

Strategic vigilance measure applied to a sample of the application (140) as a member of the Paralympic Committee member, having been retrieved (132) a valid form and duration of (18-1-2019 and 20-1-2019) after analyzing research data was collected sample responses in particular form as to every Member of Sample degrees of its own.

**Results**

View the results of the measure and analyze strategic vigilance and discussion:

<table>
<thead>
<tr>
<th>Measure alertness</th>
<th>Number of terms</th>
<th>Mean</th>
<th>SD</th>
<th>Medium</th>
<th>The highest value of the sample</th>
<th>Less value to the sample</th>
<th>(t) value</th>
<th>Error level</th>
<th>Indication differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigilant strategy</td>
<td>28</td>
<td>93.35</td>
<td>6.01</td>
<td>84</td>
<td>110</td>
<td>82</td>
<td>98.22</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td>Regulatory vigilance</td>
<td>7</td>
<td>23.22</td>
<td>2.36</td>
<td>21</td>
<td>31</td>
<td>18</td>
<td>61.99</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
</tbody>
</table>
Table (2) shows that the sample reflects the strategic vigilance and research themes that computational community values for vigilance and greater themes of hypothesis and community values that indicates the Paralympic Committee members possess a level of alertness and application strategy in their work and sports management, as Strategic watch an indispensable strategy process because it provides them with information that qualifies them to face better competition that this information affect many aspects in the environment of opportunities and threats. As the world and its many changes in the field of sports, made them realize the importance of technological development and technical success of action sports it thoroughly to facilitate their administrative procedures, which ask them to follow the new scientific and technical developments, as well as required Providing individuals who possess competencies and skills for optimal use in order to make action sports to reach high achievements.

Paralympic Committee members enjoy competitive level of vigilance in their work and sports management by monitoring their competitors strengths and weaknesses and their readiness to own proactive information about competitors and the possibility of opening new specialties in the field of sports. The competitor analysis is a fundamental step in the process of analyzing the competitive environment of the institution by examining and understanding their performance and predict future actions also allows detection of strengths that provide the opportunity for sports organization if done well.4

Strategic vigilance makes members of the Paralympic Games follow and monitor various risks that could threaten the future of Paralympic Committee, as well as take advantage of various opportunities to exploit, permanent and strict analysis environment variables for accurate information and necessary to take Comprehensive and accurate decisions. Since environmental vigilance is interested in providing all the information concerning the environmental components Paralympic and it must be dealt with carefully selected information in terms of analysis and processing for making the right decision. 5

The researchers believed that members observe the Paralympic responsibility and authority through a clear organizational structure and chart them and building on strong foundations and sober, and that this may contribute to the implementation of plans and strategies through having experience and competencies, “to achieve sporting events should be on top Degrees of regulation, proper organization on the activation of these activities that enable them to achieve a high level of efficiency and effectiveness and accomplishment. 6

This was confirmed by Ahmed “must be given the responsibility and authority of Department members work as part of their tasks and duties, as this Department must assume all responsibility for implementing all cadres formulates plans and programmes and does not mean a lack of coordination and consultation on all aspects of institutional work.

The researchers felt that the attention of the members of the Committee of the technological information sources as one of the most important technological developments in the external environment and the particular technology used by competitors in sports activities or developed to meet their needs to create competitive Compared to its competitors it allows them to shorten the route and speed the adoption of appropriate technologies and best its rivals, there must be awareness of the Paralympic Games, members of the importance of technological which aims to contribute to achieving comprehensive and integrated information system, which meets all Requirements for administrative work in Committee through speed and accuracy in performing

<table>
<thead>
<tr>
<th></th>
<th>Technological monitoring</th>
<th>Competitive vigilance</th>
<th>Environmental vigilance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>23.37</td>
<td>23.52</td>
<td>23.22</td>
</tr>
<tr>
<td></td>
<td>2.31</td>
<td>2.18</td>
<td>2.031</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>21</td>
<td>21</td>
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<td></td>
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<td>28</td>
<td>29</td>
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<tr>
<td></td>
<td>19</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>63.8</td>
<td>68.13</td>
<td>72.3</td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

≤ 0.05 significance level moral
operations and that fully reflected the work of the Committee. The availability of technology, effective information systems, which are activated, to the extent necessary for coping and adapting new technological changes, increases the degree of benefit from continuing the enterprise successfully.  

Competitive vigilance appears as a main factor in the success of enterprise performance continuity, so when collecting information on the performance of current and new competitors by knowing their plans and their methods and knowledge of strengths and weaknesses members analyze and manipulate their environment in order to turn them into meaningful information and then directed by its users to be taken into account in strategic decisions and strategies and have followed all movements and changes in the external environment and thereby contributed to the effective performance efficiency by comparing its findings with members of Arabic Paralympic Committees and regional, that this procedure helps to know his standing among other Paralympic Committees which in turn helps to correct mistakes and be discovered as a result.

Environmental vigilance also allows members of the Paralympic Games to identify and monitor political, social and legal aspects associated with their performance and provide an appropriate environment for administrative work contributes to consolidate all Paralympic Committee members to achieve goals and make good exchanges between them and the ease of processing Internal problems, which tracks all activities that relate to the surrounding environment which greatly affect performance.

Ethical Clearance - Taken from University of Baghdad committee

Source of Funding - Self

Conflict of Interest - None

Conclusions

The researchers reached the following conclusions:

The members of the Paralympic Committee gave explicit attention to the requirement of vigilance strategy in all its dimensions.

The strategic vigilance of axes (internal vigilance, technological, competitive vigilance, alertness) got high agreement rates by Paralympic Committee members, an indication of the ability of its members to understand the organizational and technological and competitive environment, environmental access to success.

Technological help Paralympic Committee members to improve the efficiency of their performance through the use of modern technologies and evolution in the field of sports.

Competitive vigilance role in supporting the sample discussed in improving the efficiency of their performance by controlling the current and new competitors, and identify strengths and weaknesses to ensure an active presence in competitions and Paralympic distinguish competitors.

For environmental vigilance has a positive impact on the evolution of events in Paralympic Committee adequacy, as its members are watching and the sequence of events through situational scopes of environmental information and assess the risks and face them consciously.

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Effects of Iraqi Medicinal Plants on the Growth of 
Trichomonas vaginalis in Vitro: A Narrative Review

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Abstract

Objectives: Regarding with improving the therapy of Trichomoniasis, natural products could be a provenance of new drugs with low toxicity and high effectiveness. Considering the side effects of metronidazole in the treatment of T. vaginalis infection, and to evaluate substitutional drugs, the effect of different Iraqi plants extracts on T. vaginalis in vitro was reviewed in this study.

Method: A computerized search for published articles was conducted over Iraqi Academic Scientific Journals, PubMed, Google Scholar, Scopus, and EBSCO databases. Exemplary investigation strategies have used for each databases. After incipient search and screening 5 papers were included in the study.

Results: The effect of different Iraqi medicinal plants extracts on T. vaginalis in vitro have reviewed. Just Five articles have included in vitro experiments. Eight types of Iraqi medicinal plants were investigated against T. vaginalis. Reviewed medicinal plants appeared uncommonly effective on T. vaginalis.

Conclusions: The present narrative review provides inclusive and useful information about searched medicinal plants with anti-T. vaginalis activity, which would be tested in the future experimental and clinical trials, and medicinal plant natural products combination therapy.

Keywords: Trichomonas vaginalis, Iraqi medicinal plants, Artemisia herba-alba, Myrtus commanis, Punica granatum.

Introduction

Trichomonas vaginalis is a unicellular protozoan flagellate parasite, that has only the trophozoites stage. Infection usually involves the urogenital tract, affecting both female and male of the reproductive age. Symptoms occur after a period of incubation of 4–28 days. In women, the usual presenting complaint is vaginal. This parasite can also lead to serious consequences, such as infertility, premature shredding of placental membranes, precocious delivery, low-birth-weight infants, and neonatal death. It is spread via unprotected sexual intercourse with an infected partner but may also be spread out of the fingers after masturbation. Trichomoniasis affects approximately 57–180 million people with the majority living in developing countries. Several epidemiological studies carried out in Iraq on this protozoan reported different ranges of prevalence. High rates of 20.11% were reported by. Some reported as low as 2.4%

Metronidazole drug commonly used for trichomoniasis treatment belongs to the 5-nitroimidazole drug family and it is notified to have about a 95% cure rate for trichomoniasis, is relatively cheap and is well tolerated but resistant strain exist. In some cases few reverse reactions have been noticed to standard doses of metronidazole, and they are usually a consequence of an allergic reaction to nitroimidazoles.

In the last decade, attentiveness has been paid to the looking for alternatives to chemotherapy for the treatment of diseases, and people now more aware and percipient in alternative therapies, specially using plants for the treatment of diseases that natural products could be a source of new drugs with low toxicity and high activity.
Considering the side effects of metronidazole in the treatment of trichomoniasis, and to evaluate alternate drugs, the effect of different Iraqi plant extracts on *Trichomas vaginalis* in vitro was reviewed in this study.

**Materials and Method**

This review includes all information about local medicinal plants in Iraq that searched as potential anti *T. vaginalis*, published in local and international journals from 2001 to 2018 using various databases including Iraqi Academic Scientific Journals, PubMed, Google Scholar, Scopus, and EBSCO databases. A computerized search for published articles was conducted, and after incipient search and screening 5 papers were included in the study.

**Results**

**Effect of Iraqi medicinal plants extracts on *T. Vaginalis* in culture medium**

Table 1. summarizes the overall effects of Iraqi studied plant as anti-*Trichomas vaginalis*.

1- *Artemisia herba-alba* *Artemisia* belongs to the family Asteraceae, is a widespread genus which comprises more than 400 species. Distributed in western and north of Iraq. Phytochemical studies on this plant evidenced the existence of many beneficial compounds such as herbalbin, cis-chrysanthenyl acetate, flavonoids (hispidulin and cirsinoleol). Some reported that plant have various biological activities including, antibacterial, anti-malarial, widely used in ancient times and is still used in the dismissal of Ascaris worms and *Aspergillus niger, Candida albicans*. The extract of alcohol used in the treatment of diseases caused by several parasitic worms.

An investigation in vitro to evaluate effects of some alcoholic and aqueous extracts of plant on growing, number, and activity of *T. vaginalis* in CPLM medium manifested that 0.50% concentration of alcoholic plant extract showed complete cessation of parasitic activity at 24 hours while the 0.25% showed complete cessation after 48 hours, while water extract at 1% concentration had total inhibition through 24 hours.

2- *Myrtus commanis* Common myrtle belongs to the *Myrtaceae* family, which comprises approximately 145 genera and over 5500 species. *M. communis*, known as true myrtle, is one of the important aromatic and medicinal species from this family. Myrtle is useful in home use for urinary tract infections and for bladder infections, infections of the urethra, antiseptic (urinary, pulmonary). The liquid plant extracts of *M. communis* in Iraq tested at different concentrations with *T. vaginalis*, 10⁶ organisms/ml. caused death of organism at pH 4.65, but no such effect was observed at pH 6.00.

3- *Capparis spinosa* A plant belongs to Capparidaceae family. grows spontaneously in cracks, crevices of rocks and stone wall sand naturally in very dry and semi-arid places in Iraq. All parts of plant used in medicine as well as root. Extracts of *Capparis spinosa* can affect *T. vaginalis* activity and it’s growth on CPLM media because it contains glycosides which have antiseptic effect.

4- *Eucalyptus camaldulensis* Member of the family Myrtaceae. The species grows in all regions of Iraq. It is a large perennial woody tree grows to 20 m tall, occasionally reaching 50 m, Leaves grey-blue, alternate, drooping, 8-22 cm long, 1-2 cm wide, often curved or sickle shaped, tapering, short pointed at base. The medicinal part of the plant is aromatic leaves which have many benefits especially in the medical field as well as oil extract from these papers, and the most important compounds effective which is a pilot oil containing a ketone group. Aqueous extract of *E. camaldulensis* (50 mg / 0.1 mL medium) at (pH 5.35) caused death of *T. vaginalis* after 24 hours in vitro.

5- *Trigonella foenum-graecum* Belongs to family Leguminosae, commonly known as fenugreek and locally as “Hulbah”. It is planted in various countries. In Iraq it grows in different regions (Ghurraf District, Southern Desert District, Central Alluvial District). The plant radiates a spicy odors which persists on the hands after touching. Wild and cultivated varieties exist. Medicinal uses (anti-diabetic, lowering blood sugar and cholesterol level, anti-cancer, anti-microbial, etc.). It is widely cultivated as a drug plant. The mucilaginous seeds are reputed to have many medicinal virtues, as a tonic, emollient, carminative, demulcent, diuretic, astringent emmenagogue, expectorant, restorative, aphrodisiac and vermifugal properties.
Aqueous extract of the plant completely inhibited the growth of *T. vaginalis* at 48 hours but mixing it with extracts of some other plants produced best effects, Mixed extracts of *T. foenum-graecum* with *Matricaria chamomilla* can completely inhibit the growth of *T. vaginalis* at 24 hours flowed by *Thymus vulgaris* at 72 h. and with *Cyperus rotundus* at 96 h.

### 6- *Viola odorata*
Member of Violaceae family. It is popularly known as sweet violet, English violet, and common Violet. It is an evergreen perennial herb growing about 10 cm tall. *V. odorata* spreads with stolons. It flowers in late winter. It distributes in many countries because it grows in most types of soils, It is cultivated in gardens and in the tree beds.

It possesses active compounds, such as alkaloids, flavonoids, refined oils and soap, with medical importance as a laxative, a vomiting and a sedative. It is also used in the treatment of burns, hypothermia, blood pressure, asthma, treatment Respiratory diseases, and against many infections caused by bacteria Its drug is also anti-inflammatory.

### 7- *Ruta graveolens*
Odoriferous herb belonging to the family Rutaceae. It is a small evergreen sub-shrub or semi woody perennial 0.6 to 0.9 m tall and almost as wide. The stems become woody near the base, but stay herbaceous nearby the tips The sea green foliage has a strong, pungent, rather unpleasant scent when bruised. Combination of two aqueous extracts of medicinal plants with concentrations of 0.15625, 0.3125, 10-20 mg/ml namely the violet, *Viola odorata*, and the rue, *Ruta graveolens*, on growth of *T. vaginalis* cultured in (CM161) medium during periods of 24, 48, 72, and 96 hours studies by Complete inhibitory effect after combination was noticed at concentration of 20 mg/ml within 24 hours and at concentration of 10 mg/ml during 48 hours.

### 8- *Punica granatum*
Pomegranate (Punica granatum) belongs to family Punicaceae, is an edible fruit cultivated in many countries and consumed around the world. It is a small tree or shrub which is native for Asia. The exfoliate and pulps of pomegranate do not consume by human because they are unpalatable, but they comprise more antioxidants power than many sources such as green tea and red wine and they are a rich sources of bioactive compounds such as poly phenols, anthocyanidins, Flavinoids and minerals mainly potassium, calcium and sodium. Pomegranate and their constituents have safety been consumed for centuries without adverse effects. However, modern research suggests that pomegranates might be useful in treating such serious conditions as prostate cancer, skin cancer, osteoarthritis, and diabetes.

Treatment with hot water extract of *Punica granatum* peel showed the best results to treat the infection of rats with trichomoniasis, where 90% of animal treated after 6 days post treatment at concentration 40%, while treatment with cold water extract appeared that 50% of rats was treated after the same time and concentration. The alcoholic peel extract treatment appear the lowest efficiency and lead to vaginal inflammation and the concentration 20% was applied only.

### Table 1. Effects of Iraqi studied medicinal plants on *T. vaginalis*.

<table>
<thead>
<tr>
<th>No.</th>
<th>Medical Plant</th>
<th>Effective extract or part</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Artemisia herba-alba</td>
<td>Alcoholic and water extract of whole plant</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Myrtus commanis</td>
<td>Aqueous extract of leaves</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Capparis spinosa</td>
<td>aqueous extract of whole plant</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Eucalyptus camaldulensis</td>
<td>Aqueous extract of leaves</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>Trigonella foenum-graecum</td>
<td>aqueous extract of whole plant</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>Viola odorata</td>
<td>aqueous extracts of whole plant</td>
<td>26</td>
</tr>
<tr>
<td>7</td>
<td>Ruta graveolens</td>
<td>aqueous extracts of whole plant</td>
<td>29</td>
</tr>
<tr>
<td>8</td>
<td>Punica granatum</td>
<td>alcoholic, cold and hot water Extracts of peel</td>
<td>32</td>
</tr>
</tbody>
</table>
Discussion

Trichomoniasis is the most predominant non-viral sexual disease with an incidence of almost 170 million new cases worldwide. This disease is correlating with divers complications. The usual medication for trichomoniasis is metronidazole, but some resistant strains to this treatment have been notified.

In this paper we have reviewed the effectiveness of eight Iraqi medicinal plants on *T. vaginalis* in vitro in our searching for an alternate drug for the treatment of trichomoniasis. Because a single method was not utilized in the various studies on the impact of medicinal plants on *T. vaginalis* in vitro, it is difficult to compare them in order to elect the plants with the best trichomonocidal activities.

The hydro-alcoholic extract of numbers of these plants have exhibited anti trichomonas activity, which was as efficacious as metronidazole in some cases.

Thus, there are enough plants with vigorous antitrichomonas activity that could be more investigated in clinical trials. Fortunately it has been noticed that some of these plants have anti-bacterial and anti-fungal affects. Thus, future investigations could be considered for the evolution of these drugs for the treatment of vaginal infections. Moreover, the combination of several plants may be recommended for future studies, as well as there are huge number of Iraqi medicinal plant their effects have not yet been studied and there is a need for further investigation in this field.

Conclusions

On the basis of this narrative review article it can be concluded that there are only few studies done in Iraq considering the effect of medicinal plants against *T. vaginalis* and more studies are needed in to cover this area. However some of these eight studied Iraqi medicinal plants showed effective capacity and could be appropriate candidates for developing new antitrichomonas drugs.

Moreover, anti-bacterial and anti-fungal effects of number these plants have been shown and so this plant can be considered as an appropriate drug for the treatment of vaginal infections. Therefore, a recommendation for developing a convenient formulation for this plant can be made for analysis in a clinical trial to evaluate its Trichomonocidal activity in vivo. studies are needed to achieve the desired results in the use of plants in trichomoniasis treatment.

Conflict of Interest: The authors assure that this review article content has no conflicts of interest.

Ethical Clearance: The review article was done without using human and animals.

Source of Funding: Taken from the Ministry of Higher Education and Scientific Research via University of Misan/Iraq.

References

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Effect of Mobility Training and Combination of Strength and Mobility Training on Selected Physiological Variables among School Cricket Players

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Abstract

The purpose of the study was to find out the effect of mobility training and combination of strength and mobility training on selected physiological variables namely explosive power in terms of vertical distance (vertical jump), explosive power in terms of horizontal distance (standing horizontal jump). To achieve this purpose of the study, forty-five school (boys) cricket players studying in the schools at Thiruvallur District were randomly selected as subjects. The age of the subjects were ranged between 15 to 17 years. The selected subjects were divided in to three equal groups of fifteen subjects each. Group I underwent mobility training, Group II underwent combination of strength and mobility training and Group III acted as control who did not undergo any special training programme. The obtained data from the experimental and control group initial and final readings underwent statistical analysis along with analysis of covariance (ANCOVA) with the application of Scheffe’s post hoc test to examine the groups’ difference and testing condition. The level of confidence had a fixation of 0.05 confidence level. The group that acted as the experimental group had improved significantly on the chosen variables in comparison with control group.

Keywords: Physiological variables, Explosive power, Vertical distance, Horizontal distance, Cricket players

Introduction

Training is a systematic process of repetitive progressive exercise of work involving learning and acclimatization. Training is the total addition of adaptations stimulation through regular exercise. Students on the exercises with reference to fitness state that it enables to tolerate more effectively, subsequently stresses of similar nature. The method of creating force on the sportsman and his capability to adapt to this stress is called sports training that leads to the enhancement of sports performance. Strength training refers to an interest in physical fitness or importance of strong weight of the body to develop specific areas of the body. Generally, it is used to develop muscular strength and power. It also develops muscular endurance elasticity and co-ordination. Strength training is the use of systematic exercises with weight and it is used merely as a mean to increase resistance of the muscle contraction. The main aim is not in learning to lift as much of possible weight but to enhance strength and power for the purpose of some other sports. Strength training refers to an interest in physical fitness or importance of strong that range of motion. There should be a period of time either before/after training or even on a separate day that is dedicated to improving mobility. Something as little as 5-10 minutes daily can be enough to see progress. One of the most common reasons you feel non athletic is because you aren’t able to get into the positions and postures that you want. It is easy to perform little mobility work as a routine for preserving it and have to perform to get it again 5 minutes a day takes a long way.

Strength training is use of resistance other than weight of the body to develop specific areas of the body. Generally, it is used to develop muscular strength and power. It also develops muscular endurance elasticity and co-ordination. Strength training is the use of systematic exercises with weight and it is used merely as a mean to increase resistance of the muscle contraction. The main aim is not in learning to lift as much of possible weight but to enhance strength and power for the purpose of some other sports. Strength training refers to an interest in physical fitness or importance of strong

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in a particular sport. It is not usually an end in itself but as a means to an end. The subject of Strength training is a controversial one. Many physical educationist believe it makes participants “muscle bound” but muscles in a permanent state of partial, limits reduces speed, causes the learning of sports skills. The necessity of strength training with regularity and the application of slow progress in training intensity with the rules of over loading maintained with proper nutrition and sufficient rest not similar to endurance training, weight training that does not require many calories. As it has a limited role in reducing the body weight, also the weight due resulting from muscle hypertrophy strength training will not result in the loss of flexibility or turn to be muscle bound. Studies on olympic athletes have shown only the gymnasts have better flexibility than the weight lifters. Strength training does not slow down muscular movement. It has also been established that increase in muscular speed (Explosive power) accompanies an increase in muscular strength.

Statement of the problem

The research aims to assess the the effect of mobility training and combination of strength and mobility training on selected physiological variables namely explosive power in terms of vertical distance, explosive power in terms of horizontal distance.

Methodology

During the training period, Group I and Group II underwent mobility training and combination of mobility training with strength training respectively for three days per week for twelve weeks of the training programme. In every day training session, the work out lasted approximately between 45 minutes and an hour, which included warming up and limbering down. Group III acted as control that did not participate in any special training programme or strenuous physical exercises apart from their regular activities as per the curriculum. The experimental groups underwent their respective training programmes under the supervision of the researcher. The subjects were carefully monitored and questioned about their health status throughout the training programme. None of the subjects have reported any injury. The obtained data from the experimental and control group initial and final readings underwent statistical analysis with ANCOVA and Scheffe’s post hoc test to examine the groups difference and testing condition. The confidence level is fixed at 0.05. The statistical analysis computed with IBM-SPSS – v21 software.

Results and Discussions

Explosive Power in terms of Vertical Distance

Table I: Analysis of covariance of the data on explosive power in terms of vertical distance of pre and post tests scores of mobility training, combination of strength and mobility training and control groups

<table>
<thead>
<tr>
<th>Test</th>
<th>Mobility Training Group</th>
<th>Combination of Strength and Group</th>
<th>Control Group</th>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>Obtained ‘F’ Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>38.20</td>
<td>37.07</td>
<td>36.73</td>
<td>Between</td>
<td>17.73</td>
<td>2</td>
<td>8.87</td>
<td>0.51</td>
</tr>
<tr>
<td>S.D.</td>
<td>4.82</td>
<td>3.80</td>
<td>3.28</td>
<td>Within</td>
<td>726.27</td>
<td>27</td>
<td>17.29</td>
<td></td>
</tr>
<tr>
<td>Post Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>45.00</td>
<td>40.27</td>
<td>37.00</td>
<td>Between</td>
<td>485.38</td>
<td>2</td>
<td>242.69</td>
<td>10.41*</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.57</td>
<td>5.03</td>
<td>2.99</td>
<td>Within</td>
<td>978.93</td>
<td>27</td>
<td>23.31</td>
<td></td>
</tr>
<tr>
<td>Adjusted Post Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>44.17</td>
<td>40.52</td>
<td>37.57</td>
<td>Between</td>
<td>320.68</td>
<td>2</td>
<td>160.34</td>
<td>20.66*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .05 level of confidence.
The table values required for significance at .05 level of confidence for 2 and 27 and 2 and 26 are 3.37 and 3.35 respectively.

The table I shows that the pre-test mean values on explosive power in terms of vertical distance of mobility training group, combination of strength and mobility training group and control group are 92.70, 92.50 and 92.60 respectively. The obtained “F” ratio of 0.04 for pre-test scores is less than the table value of 3.37 for df 2 and 27 required for significance at .05 level of confidence on explosive power in terms of vertical distance. The post-test mean values on explosive power in terms of vertical distance of mobility training group, combination of strength and mobility training group and control group are 92.70, 92.50 and 92.60 respectively. The obtained “F” ratio of 0.04 for post-test scores is less than the table value of 3.37 for df 2 and 27 required for significance at .05 level of confidence on explosive power in terms of vertical distance. The adjusted post-test mean values on explosive power in terms of vertical distance of mobility training group, combination of strength and mobility training group and control group are 92.70, 92.50 and 92.60 respectively. The obtained “F” ratio of 0.04 for adjusted post-test means is more than the table value of 3.35 for df 2 and 26 required for significance at .05 level of confidence on explosive power in terms of vertical distance. The results of the study indicated that there was a significant difference among the adjusted post-test means of mobility training group, combination of strength and mobility training group and control group on explosive power in terms of vertical distance.

Since, three groups were compared, whenever the obtained ‘F’ ratio for adjusted post test was found to be significant, the Scheffe’s test to find out the paired mean differences and it was presented in Table II.

Table II: The Scheffe’s test for the differences between paired means on explosive power in terms of vertical distance

<table>
<thead>
<tr>
<th>Mobility Training Group</th>
<th>Combination of Strength and Group</th>
<th>Control Group</th>
<th>Mean Differences</th>
<th>Confidence Interval Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>44.17</td>
<td>40.52</td>
<td></td>
<td>3.65</td>
<td>2.58</td>
</tr>
<tr>
<td>44.17</td>
<td></td>
<td>37.57</td>
<td>6.60</td>
<td>2.58</td>
</tr>
<tr>
<td></td>
<td>40.52</td>
<td>37.57</td>
<td>2.95</td>
<td>2.58</td>
</tr>
</tbody>
</table>

* Significant at .05 level of confidence.

The table II shows that the mean difference values between mobility training group and combination of strength and mobility training group, mobility training group and control group, combination of strength and mobility training group and control group on explosive power in terms of vertical distance 1.08, 1.01 and 2.09 which were greater than the confidence interval value 0.13 required for significance at .05 level of confidence.
Explosive Power in terms of Horizontal Distance

Table III: Analysis of covariance of the data on explosive power in terms of horizontal distance of pre and post tests scores of mobility training, combination of strength and mobility training and control groups

<table>
<thead>
<tr>
<th>Test</th>
<th>Mobility Training Group</th>
<th>Combination of Strength and Group</th>
<th>Control Group</th>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>Obtained ‘F’ Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.85</td>
<td>1.84</td>
<td>1.85</td>
<td>Between</td>
<td>0.0014</td>
<td>2</td>
<td>0.0007</td>
<td>0.60</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.03</td>
<td>0.04</td>
<td>0.02</td>
<td>Within</td>
<td>0.0501</td>
<td>27</td>
<td>0.0012</td>
<td></td>
</tr>
<tr>
<td>Post Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.95</td>
<td>2.10</td>
<td>1.81</td>
<td>Between</td>
<td>0.6724</td>
<td>2</td>
<td>0.3362</td>
<td>250.72*</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.03</td>
<td>0.04</td>
<td>0.03</td>
<td>Within</td>
<td>0.0563</td>
<td>27</td>
<td>0.0013</td>
<td></td>
</tr>
<tr>
<td>Adjusted Post Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.95</td>
<td>2.11</td>
<td>1.80</td>
<td>Between</td>
<td>0.6750</td>
<td>2</td>
<td>0.3375</td>
<td>264.92*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Within</td>
<td>0.0522</td>
<td>26</td>
<td>0.0013</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 27 and 2 and 26 are 3.37 and 3.35 respectively).

The table III shows that the pre-test mean values on explosive power in terms of horizontal distance of mobility training group, combination of strength and mobility training group and control group are 92.70, 92.50 and 92.60 respectively. The obtained “F” ratio of 0.04 for pre-test scores is less than the table value of 3.37 for df 2 and 27 required for significance at .05 level of confidence on explosive power in terms of horizontal distance. The post-test mean values on explosive power in terms of horizontal distance of mobility training group, combination of strength and mobility training group and control group are 92.70, 92.50 and 92.60 respectively. The obtained “F” ratio of 0.04 for post-test scores is less than the table value of 3.37 for df 2 and 27 required for significance at .05 level of confidence on explosive power in terms of horizontal distance. The adjusted post-test mean values on explosive power in terms of horizontal distance of mobility training group, combination of strength and mobility training group and control group are 92.70, 92.50 and 92.60 respectively. The obtained “F” ratio of 0.04 for for adjusted post-test means is more than the table value of 3.35 for df 2 and 26 required for significance at .05 level of confidence on explosive power in terms of horizontal distance.

The results of the study indicated that there was a significant difference among the adjusted post-test means of mobility training group, combination of strength and mobility training group and control group on explosive power in terms of horizontal distance.

Since, three groups were compared, whenever the obtained ‘F’ ratio for adjusted post test was found to be significant, the Scheffe’s test to find out the paired mean differences and it was presented in Table IV.
Table IV: The scheffe’s test for the differences between paired means on explosive power in terms of horizontal distance

<table>
<thead>
<tr>
<th>Mobility Training Group</th>
<th>Combination of Strength and Group</th>
<th>Control Group</th>
<th>Mean Differences</th>
<th>Confidence Interval Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.96</td>
<td>2.07</td>
<td>1.83</td>
<td>-0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>1.96</td>
<td></td>
<td>1.83</td>
<td>0.13</td>
<td>0.01</td>
</tr>
<tr>
<td>2.07</td>
<td></td>
<td>1.83</td>
<td>0.25</td>
<td>0.01</td>
</tr>
</tbody>
</table>

* Significant at .05 level of confidence.

The table IV shows that the mean difference values between mobility training group and combination of strength and mobility training group, mobility training group and control group, combination of strength and mobility training group and control group on explosive power in terms of horizontal distance 1.08, 1.01 and 2.09 which were greater than the confidence interval value 0.13 required for significance at .05 level of confidence. The results of this study showed that there was a significant difference exist between mobility training group and combination of strength and mobility training group, mobility training group and control group, combination of strength and mobility training group and control group on explosive power in terms of horizontal distance.

Conclusions

There was a significant difference among mobility training group, combination of strength and mobility training group and control group on selected physiological variables namely power in terms of vertical distance and explosive power in terms of horizontal distance.

Ethical Clearance- Nil

Source of Funding- Self

Conflict of Interest- Nil

References

Functional Factors on Compliance Drugs Consumption in Diabetes Mellitus Patients Related to Periodontal Health

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1Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga,
2Graduate Student of Dental Health Science, Faculty of Dental Medicine, Universitas Airlangga

Abstract

Background: Tambakrejo Health Center is one of the public health services in Surabaya that provides integrated dental and oral health services. As many as 69% of the community in health center working area were exposed to periodontal problems, and around 18% suffered from diabetes mellitus.

Objective: This study aimed to identify the factors that play a role in compliance with drug consumption in patients with diabetes mellitus associated with periodontal tissue in the working area of Tambakrejo health center in Surabaya.

Methods: This was an observational analytic study with cross sectional method. The study sample was 60 people with diabetes mellitus selected with a random sampling technique. Respondents filled out questionnaires to measure patients’ perceptions, knowledge, attitudes, and actions about drugs, diabetes mellitus, periodontal health, and the level of compliance with drug consumption. The sample oral hygiene status was determined using the Russell Index.

Results: The data obtained showed that as many as 67% of the samples had low level of compliance. Whereas, 20% of the sample had moderate level of compliance. Only 13% of the sample had high level of adherence.

Conclusion: There was a significant correlation between the level of compliance of patients taking antidiabetic drugs and the periodontal health.

Keywords: Diabetes mellitus, patient compliance, Patient medication knowledge, periodontitis

Introduction

The prevalence of diabetes globally affected around 9% of adults aged 18 years and over in 2014. The World Health Organization (WHO) projects that diabetes will be one of the main causes of death because the number has increased. Indonesia is the 4th largest country with a growth of 152% of diabetics or from 8,426,000 people in 2000 to 21,257,000 in 2030.1

According to Trekas (1984) in Tombokan et al (2005), the ability of DM patients to control their lives can affect the level of adherence. A person who is health-oriented tends to adopt all habits that can improve and restore his/her health. Non-compliance will be an obstacle to achieving treatment goals. This non-compliance can be overcome by providing counseling to people with Diabetes Mellitus and their families.2 According to Ajzen (2005), several factors that can influence medication compliance is the intention of the sufferer, which includes the attitude of the patient, support from the husband and the patient’s belief in treatment.3

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According to Herlena and Widiyaningsih (2013), an attitude will not necessarily be realized in the form of an action. The realization of a positive attitude requires supporting factors or a possible condition. If all positive behaviors have been implemented, DM patient can be included in the group of DM patients with high compliance. An impact of compliance, one of which, is control of diabetes. The attitude of respondents which is not good is indicated by the attitude of respondents who do not support the treatment of DM.

In the previous study on “Diabetes mellitus as a risk factor for periodontal problems in people aged >20 years in the working area of Tambakrejo Health Center in Surabaya 2017”, one of the highest risk factors was found. The relationship between the level of compliance with drug consumption in people with diabetes mellitus and health status periodontal showed the prevalence of patients who do not routinely consume drugs by 48%. The regularity of treatment can be supported by family support, education, patients’ knowledge about the disease and the medication they consume (Laoh et al., 2013).

Based on what has been described above, researchers are interested in conducting research to find out what factors influence compliance with drug consumption in patients with diabetes mellitus associated with periodontal tissue in the working area of Tambakrejo Health Center, Surabaya.

Subjects and Method

This was an observational analytic study with cross sectional method. This study was carried out in Tambakrejo Health Center working area, Surabaya. The population in this study were 60 people age 45-60 years old with diabetes mellitus who were in the Tambakrejo Health Center working area as samples obtained through random sampling techniques.

The independent variable in this study was compliance to drug consumption in people with diabetes mellitus. The dependent variable in this study was periodontal tissue. Data collected by questionnaire and intra oral examination for checking the periodontal health with Russell Index. Data were analyzed by Correlation Test and significance with 95% confidence intervals. To identify risk factors, Prevalence Ratio, Relative risk, a significance were calculated, and correlation with linear regression test was carried out so that the level of possible risk of each variable studied on the level of compliance taking medication could be estimated.

Findings:

Table 1. Analysis of periodontal health data with the Russell index

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinically normal</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Simple gingivitis</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Beginning destructive periodontal disease</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Established destructive periodontal disease</td>
<td>37</td>
<td>61.6</td>
</tr>
<tr>
<td>Terminal disease</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 1, the highest percentage is found in respondents who have the Russell index in the form of Established Destructive Periodontal Disease, which is 61.7%. Then, it was followed by Terminal Disease, which was equal to 35%. The third were Clinically normal and the Beginning Destructive Periodontal Disease, which were 1.7% respectively, and the last was Simple Gingivitis with a percentage of 0%.

Table 2. Correlation and significance of risk factor variables with the level of respondents’ compliance to antidiabetic treatment

<table>
<thead>
<tr>
<th></th>
<th>Compliance of patients in taking medication</th>
<th>Russell Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman’s rho</td>
<td>0.265</td>
<td>0.041</td>
</tr>
</tbody>
</table>

Based on Table 2, there is a correlation between the level of adherence of patients taking antidiabetic drugs and the periodontal health level as measured by the Russel Index with α of 0.041 <0.05 and the correlation index of 0.265.

The results of the study on patients’ knowledge of diabetes drugs were obtained with a low category of 30%, moderate of 46.7% and high of 28.3% of respondents. Drug knowledge of these patients was influenced by several factors, especially the level of education of patients, explanations and how the explanations received by patients and how the role of health care workers in explaining to these patients. This is in accordance with research by Dunning and Manias (2005) in patients.
with diabetes mellitus in Australia in which there is a close relationship between the level of education and “training” received by patients on how patients act in dealing with diabetes and the reasons patients sometimes only take medication if told to do so.⁶

Based on the results of the study with the risk factors for knowledge of patients with diabetes mellitus, the highest percentage was found in respondents who had high or good knowledge of diabetes mellitus by 55%, then 35% of respondents had moderate level of knowledge of diabetes mellitus, and 10% of respondents had low level of knowledge. This is not in accordance with studies that stated that patients with better knowledge of diabetes mellitus have a good level of compliance to taking drugs. This can happen because the level of adherence to taking antidiabetic drugs is not only influenced by knowledge about antidiabetic drugs, but also by other factors, such as communication with the family and health care workers.⁷

From the results of the research on the patients’ knowledge regarding the role of health services, the results showed that the knowledge of the general practitioners and their suggestion to refer to patients with diabetes mellitus to the dentist had an effect on the level of compliance to taking patient medication.⁸

Patient attitudes towards antidiabetic drugs found 85% of respondent’s were high or good attitudes towards anti-diabetic drugs, 15% of patients were on anti-diabetic drugs and no respondents had low or bad attitude towards anti-diabetic drugs. Most patients wanted to get well soon from their diabetes and thought that anti-diabetic drugs were important for consumption, but it was not comparable to the actions they took on antidiabetic drugs and diabetic control, which was consistent with research in the third world where most population have low knowledge but have high attitude to recover, but it is not supported by adequate facilities.⁹

From the results of the study, 93.3% of respondents had good attitude towards diabetes. No respondent had poor attitude in dealing with diabetes. This showed that even though the patients’ attitude was good towards diabetes mellitus, it did not affect the level of awareness of patients in taking anti-diabetic drugs. This is the same as expressed by the study that even patients have good attitude, if it is not supported by adequate knowledge, the output of the patients’ actions remains poor.⁹

From the results of this study, most respondents (80%) had moderate/normal attitude towards periodontal health. There is a difference between attitudes and knowledge of diabetes and periodontal disease. This is different from research in developed countries. The average patients have knowledge and good attitudes towards the health of the body, including the oral cavity and good correlation due to good health service factors, the government that cares about the community, and affordable and even free health services because they are covered by insurance.⁶

From the results of the research respondents’ perceptions of antidiabetic drugs, it was found high/good perception rate of patients on anti-diabetic drugs by 81.7%, and no patients had a low/poor perception of anti-diabetic drugs. This is because the price of diabetic medicine is relatively cheap and even free and can be obtained easily by patients both at the nearest pharmacy and at the health centre. Patients also feel that the consumption of drugs does not disturb their diet. The dosage is also sufficient for patients, it is not difficult for respondents to drink.⁶

From the results of research with risk factors for patient perceptions of health services, it was found that the highest percentage was in respondents with moderate perceptions of health services (51.7%), followed by high perceptions of health services (30%), and low perception of health services (18.3%). Good interpersonal relationships will make patients feel a good appreciation too, which ultimately makes them happy, even satisfied with the service received. The satisfaction that remains within them will shape the perception that health services have certain quality.¹⁰

From the results of the study of patient perceptions of the duration of therapy, data obtained showed that 53% of patients answered yes to the question “Tired of having taken too long medicine”, in which it was negative. Furthermore, 47% of patients answered no to the statement in which it was positive. This was due to many factors, such as the data distribution which was not good or because there were not many samples. Respondents tended to be bored because the use of drugs that lasted long and continuously. This research was in line with the research results.²

Data from the research on the patients’ actions on antidiabetic drugs found high or good level of patient...
action on antidiabetic drugs as much as 61.67%. Whereas, 28.3% of respondents had low or poor levels of action against antidiabetic drugs, and 10% of respondents had moderate level of action on antidiabetic drugs. This illustrates that the patients’ actions on antidiabetic drugs affected compliance to taking anti-diabetic drugs. The patients’ actions are included in understanding the doses, complications, and side effects of the drug. If the patients have good understanding and action, they will tend to be more responsible in the routine of taking medicine. 

Data from research on the actions of patients on diabetes mellitus showed the level of action of patients which was high or good for diabetes mellitus by 71.67%, the level of patient action was low for diabetes mellitus by 18.3%, and the level of action of patients which was moderate on diabetes mellitus by 10%. This illustrates the relationship between actions against diabetes mellitus with compliance to taking diabetes mellitus medication. With good actions from patients, such as routinely doing blood sugar checks and control in the doctor, patients will tend to be more obedient in taking antidiabetic drugs.

The results of the study also discussed the actions of patients on periodontal disease and found that respondents had moderate actions on periodontal health (71.7%), respondents had high actions on periodontal health (16.6%), and respondents had low actions on periodontal health (11.7%). Patients who had low knowledge and poor attitude towards their periodic health also had poor or inadequate actions to keep their periodic health, such as never visiting a dentist, not regularly toothbrushing, doing toothbrushing in wrong way, and never using dental floss.

The results of statistical tests showed high and significant correlation between the Russell index which describes the periodontal condition and the Patient Compliance Level for consumption of antidiabetic drugs. There was correlation between the level of compliance of patients taking antidiabetic drugs and the periodontal health measured by the Russell Index with α of 0.041<0.05 and correlation index of 0.265.

**Conclusion**

There was close relationship between the level of compliance of respondents to the treatment of diabetes with the level of periodontal health (Russell Index).

**Conflict of Interest:** Nil

**Source of Funding:** Self funding

**Ethical Clearance:** This research is a branch of the main research entitled: Overview of Denture Demand of Elderly in Nursing Home around Public Health Centre.

**Acknowledgement:** Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia.

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Design and Implementation of Maximum Airflow Meter

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Abstract

Many physiological changes occur during pregnancy, especially changes in pulmonary which occur in the fourth week of pregnancy due to an elevation of the diaphragm and thoracic wall. The aim of this study was: (1) developed and implementation of Maximum Airflow Meter for measuring the airflow parameter during expiration to detect various types of diseases and obstruction in the respiratory airway and (2) used of Statistical package for social sciences (SPSS) which is a statistical analysis software run t-test to make a comparison between the airflow parameter of pregnant and non-pregnant women. The research was carried out on twenty-three women who perform Maximum Airflow Meter to obtain their airflow parameter. The results showed the change in airflow between the pregnant and non-pregnant and the results of the SPSS displayed a significant difference ($P<0.004$) between these pregnant and non-pregnant women.

Keywords: airflow, p-value, Arduino, SPSS.

Introduction

The main function of the respiratory system is a gas exchange. Oxygen (which cells need to function) is transferred from the external environment into the bloodstream while carbon dioxide (Which is a waste product of cellular function) must rid of into the outside air. Many of tissue cells in the body located too far from the inhaled air where gas exchange takes place directly, and instead, blood carried the oxygen to the cells, this occurs during breathing where oxygen enters the mouth or nose during inhalation. After entering the nose, the air passes through the larynx and then to the trachea which in turn splits into two bronchi. Each one of the bronchi (bronchus) bifurcates into two smaller branches forming bronchial tubes. The bronchial tubes form a great number of pathways inside the lung and terminating at the end to small sacs called alveoli. The gas exchange takes place at the alveoli, where oxygen diffuses into the lung capillaries and exchange with carbon dioxide. After the gas exchange occurs, exhalation begins and the air containing CO$_2$ return through the bronchial pathways and expelled to the external environment through the mouth or nose $^{1,2,3,4}$.

Airflow resistance in the airways of the respiratory system is a concept that used to describes the resistance to air flow beginning from its breathing point to alveoli, which caused by forces of friction $^{5,6}$.

The airflow resistance has the unit (cm H$_2$O s/L), and it describes the relationship between the rate of airflow and the driving pressure: $^{6,7,8}$

The resistance is proportion inversely to the fourth power of the radius; therefore, airway resistance decreases as lung volume increases $^{5}$.

In turbulent flow, the resistance is comparatively large because of large driving pressure is necessary to yield the same airflow rate in contrast with a laminar flow. The high resistance which causes problems in the function of respiration may be an indication of obstructed pulmonary diseases as asthma $^{5,6}$.
\[ R = \frac{\Delta P}{\bar{V}} \]  

(1)

Where
\( \bar{V} \): the volume flow rate, ml/s,
\( \Delta P \): the pressure drop, cm H\(_2\)O, and
\( R \): is the resistance of airflow, cm H\(_2\)O s/L.

For a laminar flow, the flow rate can be calculated using Poiseuille’s law by: 5, 6, 7, 9

\[ \bar{V} = \frac{\Delta P \pi r^4}{8 \eta l} \]  

(2)

Where
\( \eta \): is the viscosity of the gas, poises,
\( l \): is the airway length, cm, and
\( r \): is the radius of the tube, cm.

**Cases Classification**

Twenty-three women were selected in this study, these women perform airflow test by using Maximum Airflow Meter and they are classified as follows:

**Maximum Airflow Meter:**

**Control group**, 15 cases of healthy normal non-pregnant women.

**Experimental group**, 8 Cases of healthy normal pregnant women. All cases of pregnant women in this group are in their third trimester.

The height of these women are range from 147 to 171 cm, their weight are range from 43 to 117 kg, and their age are range from 20 to 40 years, therefor this study is carried only for the women in these limitations.

**Developed of Maximum Airflow Meter**

The following components, as shown in Figure.1 were used to developed and implementation of Maximum Airflow Meter:

**Airflow Sensor**

The airflow sensor (airflow sensor, china) is high sensitive, low offset pressure, high resolution, and accurate airflow reading, as shown in Figure.2. It does not suffer from noise produced by long cables. This sensor has measurement range of up to 1000 L/m. It is used in a wide range of applications. In this research, the airflow sensor is used in respiratory system application to measure the flow of air coming from the lungs and mouth during expiration. The output of this sensor is number and has unit of (liter per minute) which is very important to detect and identify disease or any obstruction in the airways. It is not used only for measuring the airflow of pregnant and non-pregnant women as in this research but it also can be used to measure the airflow of patients and identify diseases such as asthma. The airflow sensor has two ports, the top port is “active” (measures the pressure of air from open at the front of pitot tube) and the bottom port is “static” (measures ambient air pressure).

![Figure 1: Components of Maximum Airflow Meter.](image1)

![Figure 2: Airflow sensor with pitot and rubber tubes.](image2)
B. Pitot tube

Pitot tube has two pipes, one angled pipe for static port and other straight pipe for active port of the sensor, as shown in Figure.2.

C. Rubber Tubes

Rubber tubes are used to connect the airflow tube to the airflow pin, as shown in Figure.2.

D. 4 pin cable

The 4 pin cable is used to connect the airflow sensor to the Arduino, as shown in Figure.2.

E. Arduino Uno and PC with IDE software

Arduino Uno (Arduino Uno, China) is an open-source physical board used for building a wide variety of electronics projects. It can control and interact with different types of sensors. The main advantages of this type of Arduino are:

- Simply use for many purposes
- Simply connect to the computer by USB cable
- 32 KB of flash memory for storing code
- Powered it with battery, and
- Inexpensive.

Arduino Uno consists of the microcontroller which is a physical programmable circuit board, as shown in Figure.1, and a part of the software, or IDE (Integrated Development Environment) that can be run on a computer to write and upload code to the physical board. The Arduino IDE uses an easy version of C++ to simplify learning to program. The voltage needed for most types of Arduino models is between 6 and 12 Volts. The Arduino has numerous pins (6 analog pins and 13 digital pins); each pin is labeled on the physical board and allow connect the external hardware to Arduino to use it for a specific function.

F. Standard A-B USB cable

USB cable (USB 2.0 A-Male to B-Male cable) is used to plugin Arduino board into computer, the USB connection has high speed to load code on the Arduino board, the USB cable is shown in Figure.1. It is multi-shielded cables to minimize interference.

G. Liquid Crystal Display (LCD)

LCD is a flat display (16 X 2 segments) essential to display the output data of the measurements to the users, as shown in Figure.1. It can control the display of data by the microcontroller by connected the LCD to specific pins in the Arduino.

H. Wires

Wires were used to make connection between LCD display and Arduino.

I. Breathing tube with a mouthpiece

The Breathing tube and mouthpiece contains the rubber tube and airflow sensor within the core of the tube and mouthpiece to prevent the influence and interference of external environments on the measurements of the sensor, as shown in Figure.4.

J. Batteries

Two batteries (3.7 V) were used to power up an Arduino which is long lived battery, as shown in Figure.1.

Implementation of Maximum Airflow Meter

1. The IDE software was installed in PC and open to prepare for programming.

2. The Arduino was connected to PC by USB cable and it was connected to batteries by wires, as shown in Figure.1 and Figure.3.

3. The LCD was connected to Arduino by wires, as shown in Figure.3.

4. The airflow sensor was connected by 4 pin cables to Arduino, as shown in Figure.3.

5. The pitot tube was connected to the airflow sensor by rubber tubes, the straight pipe connected to active port and the angled pipe connected to static port, as shown in Figure.2.

6. The specific codes used to power and programming Arduino, LCD, and airflow sensor were written in IDE software.

7. Battery was connected to Arduino and used to power up it instead of PC (after run and save program with codes in Arduino), as shown in Figure.3, this enable airflow measurement device to perform test and to display the reading without PC.
8. A switch was connected to battery and used to turn on and off the airflow measurement device.

9. The breathing tube and mouthpiece was enclosed the rubber tubes and air airflow tube, as shown in Figure.4.

10. A box was designed and manufactured to houses all components to protect them from damage and/or cutting in wires, as shown in Figure.4.

11. Finally, the pregnant and non-pregnant women were closed their nose by using nose clip and breathed out through the mouthpiece as forcibly as possible to obtain airflow parameter to make comparison between them.

In this study, an independent sample test is used to make a comparison between the expiration of non-pregnant and pregnant women in the third trimester depending on their airflow test. The one-way analysis of variance (ANOVA) is used to obtain whether there are any statistically significant differences between the averages (means) of two or more independent groups. In this research, it is used to obtain the means airflow parameter of pregnant and non-pregnant women and then draw the mean to facilitate the comparison between these groups.

**Results of Maximum Airflow Meter**

The result of Maximum Airflow Meter is the airflow parameter which is the amount of air that is flowing out of the lungs through the respiratory system during expiration.

In this research observed that there are differences between the values of airflow between the pregnant and non-pregnant women. Results showed that airflow for non-pregnant women are range from 305 to 585 (L/m) and airflow for pregnant women are range from 304 to 388 (L/m). The airflow parameter for non-pregnant women is shown in Table.1 and the airflow parameter for pregnant women is shown in Table.2.

**Table.1 Airflow of non-pregnant women**

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age</th>
<th>Weight</th>
<th>Height</th>
<th>Airflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
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<td>159</td>
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<td>24</td>
<td>64</td>
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<tr>
<td>15</td>
<td>33</td>
<td>79</td>
<td>161</td>
<td>336</td>
</tr>
</tbody>
</table>

**Statistical Analysis**

SPSS is a software program used for statistical analysis of the results obtained in the research; it is used to run the t-test and one-way ANOVA. The t-test is used to make a comparison between the means or an average of two different groups and explain if these differences are significant or occur by chance.
Table. 2 Airflow of pregnant women in the third trimester

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age</th>
<th>Weight</th>
<th>Height</th>
<th>Airflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26</td>
<td>81</td>
<td>168</td>
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<td>2</td>
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<tr>
<td>5</td>
<td>33</td>
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</tr>
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<td>164</td>
<td>304</td>
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<td>7</td>
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<tr>
<td>8</td>
<td>31</td>
<td>61</td>
<td>157</td>
<td>306</td>
</tr>
</tbody>
</table>

Conclusion

- This research confirmed that there was a significant difference in airflow parameter ($P<0.004$) between pregnant and non-pregnant women.

- In this research observed that there are decreases in the values of airflow parameter in the third trimester of pregnancy this decreases in airflow value is due to a reduction in the compliance of the lungs because of enlarges the chest wall circumference during pregnancy and causes limited expansion of the lungs.

Ethical Clearance: Taken from Al-Nahrain University, Baghdad- Iraq.

Source of Funding: Self-Funding.

Conflict of Interest: None.

References

Effect of An Educational Program about Polycystic Ovarian Syndrome on Knowledge of Adolescent Female Students

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Abstract

Background: Polycystic Ovarian Syndrome (PCOS) is a problematical disorder with various presentations. The disorder, however, can be treated carefully and efficiently to aid the female student patients to increase their fertility and lead healthy lives.

Objective: The objective of this article is to evaluate the impact of an educational program on the knowledge of adolescent female students about PCOS.

Methodology: A quasi-experimental design was conducted at the College of Nursing University of Mosul for the period 16th to (19th) February 2018 on sixty female students who were divided randomly into two groups (study=30 and control=30). Before implementation of the EP, both groups were exposed to pretest. Only the study group was enrolled in the EP. After one week both groups were exposed to the post-test.

Results: Before implementing the EP both groups show low levels of knowledge regarding POCS. After one week of the implementation of the teaching program the study group shows improvement in their knowledge scores about all knowledge categories related to POCS. Statistically significant difference was found between students’ age and family factor with their knowledge at pretest.

Conclusions: The EP had a positive impact on students’ knowledge concerning POCS. The study recommends that further education programs regarding POCS should be implemented in multi-setting on different target populations in order to generalize the outcomes.

Key Words: Adolescent Female, Educational program, polycystic ovarian syndrome POCS.

Introduction

Adolescence is one of the most dangerous stages in which a human passes through his various stages characterized by constant renewal and progress in the ascension towards human perfection. The vulnerability at this stage that moves women from childhood to adulthood is the changes in the various manifestations of growth (physical, physiological, mental, social, emotional, religious and moral), and the human being is subjected to multiple conflicts, both internal and external [1-4]. Polycystic ovarian syndrome (PCOS) is a very common endocrine disorder affecting about 5-10% of women of the real causes of the syndrome does not have childbearing age. Carefully identified, presentation symptoms vary greatly from case to case, making it challenging for doctors to diagnose them [5-8]. Primary signs and the syndrome of POCS are irregular or absent menstrual cycles, increased secretion of androgen, male hair growth, and abnormal morphine. It is challenging to diagnose PCOS because women do not always show all symptoms. It is associated with varying degrees of abdominal obesity, insulin resistance, and other risk factors for chronic diseases including dyslipidemia, hypertension, and increasing levels of pro-inflammatory signs [9-10]. The causes of PCOS are still unknown. However, it is concluded that PCOS is a large-scale
metabolic disorder that extends beyond patients to excess fertility and androgen [11-14]. Recently, it was observed that there is an increased prevalence rate of PCOS and it has short- and long-term effects on physical and mental health, as well as costs on the health-care system. However, these rapid changes are having a serious effect on women’s health, one may ask why there is a lack of awareness about the syndrome Polycystic Ovaries [15-21]. Education is one of the overall strategies to promote public health. It is therefore more important to establish an awareness program on adolescent polycystic ovary syndrome to identify early signs of PCOS. The researcher was motivated to conduct an educational program to increase the knowledge of adolescent girls about PCOS. The main goal of the current study was to determine the effect of an educational program upon the nursing student knowledge regarding PCOS.

Methodology

Research Design

A pretest post-test quasi-experimental design was carried out in the current study for the period of 16th to 20th of April, 2018.

Study Setting

The study was conducted in the College of Nursing/University of Mosul at Mosul City, Iraq.

Population and Sampling Strategy

The initial sample consisted of Sixty (60) students. All of the participants were aged between 18 and 19 at the beginning of the study. The students were divided into two equal groups (study group = 30 and control = 30 participants) using the simple random sampling technique.

Inclusion and Exclusion Criteria

Data Collection Procedures

The interview sheet was constructed by the researcher to gather information interrelated to the sample’s socio-demographic characteristics like age in years, level of parent’s education, menarche history, menstrual regularity family history, and source of information. Forty questions were adopted to examine students’ knowledge regarding PCOS and covered general concepts—etiology-risk factors, signs and symptoms, and types of disease. Participant responses to the knowledge questionnaire were scored and the correct responses were given (one) and wrong answers were given (zero). For each category of knowledge, a mean score was calculated. The structured educational program includes introduction of polycystic ovarian syndrome, causes and risk factors, diagnosis, and complication and management of polycystic ovarian syndrome. The study instruments and EP were tested for validity and reliability.

Data Analysis

Data were entered into a PC file; using Statistical Package for the Social Science (SPSS, version 22) in statistical analysis. Two approaches were applied, Descriptive Data Analysis, an approach that is employed through calculation of Frequency, Distribution, Percentage, Mean of Score and Standard Deviation and Inferential Data Analysis, calculation of the Independent Samples test (t).

Ethical Clearance: Prior to commencing the study, an ethical clearance was sought from the relevant authorities. The participants were informed of the importance and purpose of the study and their verbal and written consent were taken before conducting the data collection.

Results

The differences between pretest and post-test are highlighted in Table 1. Paired t-test was performed to assess the effectiveness of the EP on PCOS knowledge. For the study group the observed value (15.1) was higher than the tabulated value (df 29 = 1.8) at (p< 0.05). The mean post-test knowledge score was (52.1±3.1) significantly higher than the mean pretest knowledge score (17.2±2.7). For the control group the “t” observed value (1.2) was lower than tabulated value (df 29 = 1.8), which means that the EP was impactful in enhancing the knowledge of adolescent females regarding PCOS for the study group. Table 3 shows the differences between pretest and post-test knowledge scores of adolescent about Polycystic Ovarian syndrome. The “t” test was calculated to this purpose. Further statistical tests revealed that scores in post-test in all categories were significantly increased as compared to pretest knowledge scores.
Table 1: Impact of education Program regarding PCOS (n = 60).

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Test</th>
<th>Mean</th>
<th>SD</th>
<th>“t” value</th>
<th>DF</th>
<th>P value</th>
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<td>Pretest</td>
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<td>5.2</td>
<td>1.2</td>
<td>29</td>
<td>NS</td>
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<td></td>
<td>Posttest</td>
<td>16.7</td>
<td>3.6</td>
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</tbody>
</table>

“t” tabulated =1.8 at p value = 0.05

Table 2: Impact of education Program regarding PCOS (n = 60).

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Test</th>
<th>Mean</th>
<th>SD</th>
<th>“t” value</th>
<th>DF</th>
<th>P value</th>
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<td>3.2</td>
<td>6.2</td>
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<tr>
<td></td>
<td>Posttest</td>
<td>9</td>
<td>1.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

PCOS is a common condition affecting 20% of females of childbearing age. The percentage is increasing continuously and significantly, however, these rapid changes are having a serious effect on women’s health which requires finding solutions and efforts to this problem. The students’ knowledge on PCOS was estimated at pretest, the study showed that highest of the students had low level of knowledge and only 7.3% of students had respectable knowledge. This deficiency of knowledge concerning PCOS may be due to students not obtaining sufficient facts related to PCOS. The results presented in table demonstrated that the education program effectively upgraded and promoted the knowledge of teenage females concerning PCOS. These results also confirmed in the study conducted by Mohammed A which showed that the mean post-test scores after the educational program were significantly higher compared to mean scores in pretest. The findings of the current study are consistent with those of Tamilarashi B, Vathana V which indicates increase an in knowledge score after implementing a structured teaching program. These findings further support the article of Patel K who stated that strategic intervention sessions enhanced the knowledge of adolescent females. This also accords with an earlier observation, which revealed that post-test scores were higher than pretest scores. Therefore, it was verified that the structured teaching program did improve the knowledge of adolescent females. The findings observed in this study mirror those of the previous study that have examined the effect of educational intervention on female Sciences student knowledge about PCOS. The students (82.9%) who had the largest deficit in their knowledge about PCOS were enrolled in an educational program and after that all of them were knowledgeable about PCOS. Finally, the present findings seem to be consistent with other research which found highly statistically significant improvement in nurses’ knowledge immediately after program implementation, as significant differences were found between the mean pretest and post-test knowledge score.
Conclusions and Recommendations

The study concluded that the EP had a positive impact on students’ knowledge concerning POCS. Based on the findings of the current study, the researcher recommends the importance of adopting educational programs that help teenage females acquire adequate information about PCOS. The researcher also believes that the study should be reapplied to a variety of female groups of society to generalize the study outcome.

Acknowledgement: This research was partially supported by the College of Nursing. I thank my colleagues from the College of Nursing who provided insight and expertise that greatly assisted the research, although they may not agree with all of the interpretations/conclusions of this paper. Also, special thanks to students who participated in this study

Conflict of Interest Disclosure: I certify that there is no actual or potential conflict of interest in relation to this article.

Source of Funding- Self

References


[16] from department of physiology and polycystic


[22] a study on knowledge & awareness of polycystic ovarian syndrome among female non-medical Submitted To Tilka Fannana Submitted By Safa Jahangir ID : 2013-3-70-001 Department of Pharmacy East West University. 2013;


Improving Treatment Compliance with Hypertension Patients Involving Family Role

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Health Polytechnic Ministry of Health Manado, Indonesia

Abstract

The role of the family is very important in every aspect of the health of family members, in the process of monitoring, maintaining and preventing complications of hypertension. This study aims to determine the relationship of the role of the family with treatment compliance with hypertensive patients. The results showed that treatment compliance of hypertensive patients increased with increasing family role (p <0.05). It is expected that the health center can make a program to improve the role of the family in the treatment of hypertensive patients so that it can improve treatment compliance for hypertensive patients.

Keywords: family role, medication adherence, hypertension patients.

Introduction

According to the World Health Organization (WHO) Hypertension or high blood pressure is an increase in per system pressure in the arteries, where systolic blood pressure is above 140 mmHg and diastolic pressure above 90 mmHg. Hypertension contributes to almost 9.4 million deaths from cardiovascular disease every year ¹⁴. The national hypertension prevalence based on 2013 risk is equal to 25.8%, the highest in the Bangka Belitung Islands (30.9), while the lowest in Papua is (16.8). Based on these data, from 25.8% of people with hypertension only 1/3 were diagnosed, the remaining 2/3 were undiagnosed. Data shows only 0.7% of people diagnosed with high blood pressure do not take hypertension medication. This shows that most hypertensive sufferers are not aware of suffering from hypertension or getting treatment.

One indicator of the health status of a family in the implementation of the Healthy Indonesia program is that hypertension sufferers take medication regularly. The healthy Indonesia program through a family approach emphasizes the importance of the role of the family in health development. According to the data of the Ministry of Health (Kemenkes) of the Republic of Indonesia, there are 75% of families suffering from hypertension but not taking medication ²⁰.

Based on preliminary data obtained at Kawangkoan Health Center, North Kawangkoan Subdistrict, Minahasa Regency, from January to October 2017 there were 104 hypertensive patients, 64 of whom did not come to control and discontinued medication, but previously diagnosed, 40 other patients came obediently to the puskesmas. The survey results on November 8, 2017 during interviews with 10 hypertensive patients who came to the Kawangkoan Health Center from interviews with 3 patients delivered by their families and routinely treated the puskesmas once a week, 4 patients had a low level of adherence and rarely controlled treatment on the grounds that they stated not feeling any complaints back / feeling healthy, 3 other patients forgot to remember the time of treatment control because they were busy with their activities or work.

The role of the family is very important in every health aspect of his family members, in the process of monitoring, maintaining and preventing the occurrence of complications of hypertension. In addition, the role of the family is able to improve the compliance of hypertensive patients in undergoing treatment⁷.
The formulation of the problem in this study is whether the family plays a role in improving compliance with treatment for hypertensive patients at the Kawangkoan Public Health Center, North Kawangkoan District, Minahasa Regency?

Material and Method

This study aims to determine the role of families in improving adherence to treatment for hypertensive patients at the Kawangkoan Public Health Center.

The type of research used is analytical survey with method cross sectional. The study was conducted in September 2017 until July 2018 at Kawangkoan Health Center, North Kawangkoan Sub-District, Minahasa Regency.

The independent variable is the role of the family and the dependent variable is compliance with treatment for hypertensive patients. The family role is measured using a questionnaire consisting of 12 questions, with good role categories (≥ 80 - 100%) and poor roles (<79%). Medication compliance for hypertensive patients was measured using a questionnaire consisting of 22 questions, with obedient categories (≥ 75 - 100%) and non-compliance (<75%).

The population in this study are families that have family members who suffer from hypertension in January-October 2017, amounting to 104 patients. The sampling technique used was purposive sampling, ie samples taken intentionally or planned by researchers. Obtained a sample of 50 people.

Data collection was carried out after obtaining permission from the head of Kawangkoan Health Center. Researchers waited for hypertension patients to come to visit the health center, then the researcher explained the purpose of the study and gave informed consent. After obtaining approval from the respondent, blood pressure measurements were taken and questionnaires were distributed to respondents to be filled. Data obtained through the next questionnaire were obtained using univariate analysis and bivariate analysis. Statistical analysis using software namely SPSS for windows and using the chi-square statistical formula with a degree of significance (α) <0.05, and a significant level of > 95%.

Finding

Distribution of Hypertension Disease

Based on the frequency of hypertensive patients, it was found that from 52 samples of hypertension patients found the highest with 23 people (53.8%) at moderate hypertension, while the lowest with 10 people (21.2%) at the level of hypertension light.

The Role of the Family on Medication Compliance with Hypertensive Patients

Table 1. Cross Tabulation Between the Role of Families with Medication Compliance Patients with Hypertension

<table>
<thead>
<tr>
<th>Role of Family</th>
<th>Treatment Compliance Patients Hypertension</th>
<th>Total</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disobedient</td>
<td>Obedient</td>
<td>N</td>
</tr>
<tr>
<td>Poorly</td>
<td>14</td>
<td>70.0</td>
<td>6</td>
</tr>
<tr>
<td>Good</td>
<td>8</td>
<td>25.0</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>42.3</td>
<td>30</td>
</tr>
</tbody>
</table>

From the analysis of the relationship of the role of the family with medication treatment for hypertensive patients above it was found that some of the roles of the family were poor and categorized as noncompliant with 14 respondents (70.0%), for which the role of the family is poor and obedient in treatment there are 6 respondents.
(30.0%), while the role of the family is good and non-compliant, there are 8 respondents (25.0%) and the role of the family is good and obedient to treatment 24 (75.0)

**Conclusions and Recommendations**

Based on the results of the study showing that 52 families were found that some of the roles of the family were not good and categorized as non-compliant, there were 14 respondents (70.0%), whose family roles were not good and were there were 6 respondents (30.0%), while the family role was good and non-adherent, there were 8 respondents (25.0%) and the family’s role was good and obedient to treatment 24 (75.0%). From the results of statistical tests using the chi-square test, the p-value = 0.001 means that p-value <0.05, so Ho is rejected and Ha is accepted. This shows that there is a significant relationship between the role of the family and compliance with treatment for hypertensive patients at the Kawangkoan Health Center, Kawangkoan sub-district, north of Minahasa district. So it can be concluded that if the family role is good then compliance will be higher.

**Discussion**

This study is in line with previous research conducted by Agnes, et al. (2015). It was found that most of the family roles were poor and categorized as non-adherent treatment with 19 respondents (29.7%), whose family role was poor and obedient to treatment with 4 respondents (6.2%), while there are 6 respondents (9.4%) who have good and disobedient family care, and those who have a good family role and adhere to treatment there are 35 respondents (54.7%) from the results of statistical analysis using the test The chi-square value obtained \( p = 0.000 \), which means that the p value is smaller than \( \alpha \) (0.05). There is a relationship between the role of the family and adherence to treatment for hypertensive patients at the Kawangkoan Health Center, Kawangkoan sub-district, north of Minahasa district.

The results of this study are supported by the theory of Young and Busgeeth, (2010) illustrating that the role of families in providing care at home can reduce morbidity and mortality in patients. It was also explained that the role of the family is able to improve patient compliance. Family support can improve patient adherence to treatment 14.

According to researchers, families can be a determinant of the success or failure of treatment carried out by someone in undergoing a treatment because the family can be very influential in determining the beliefs and health values of individuals and can also determine about the health programs they can receive.

The results showed that family members who gave good support and showed caring attitudes to family members suffering from hypertension had an important role in adherence to treatment. According to researchers, the attention of family members ranging from delivering to health services, helping with medical treatment, reminding them to take medication, proved to be more obedient to undergoing treatment compared to hypertensive patients who received less attention from family members.

The results of this study are supported by previous research conducted by Triyani, et al. (2013) stating that there is a significant relationship between family support and adherence to treatment of hypertensive patients in Ngaliyan Semarang Public Health Center, compliance with treatment for hypertensive patients in Ngaliyan Semarang Public Health Center is 37 patients (52.9%).

The results of this study are also supported by the theory of Palmer & William, (2007) that treatment adherence to hypertensive patients is important because hypertension is an incurable disease but must be controlled or controlled so that complications do not result in death10.

**Conclusion**

The results of this study are expected to contribute positively to improving treatment compliance for hypertensive patients. It is expected that the health center can create a program that can increase the family’s understanding of the importance of support and what forms of support can be given to families to improve treatment compliance for hypertensive patients.

**Conflict-of-Interest Statement**

In this study between researchers and research, subjects have no conflict of interest, because they do not have personal relationships or informal relationships with researchers.

**Source of Funding:** The source of funds in this study is independent funding from the research team.
**Ethical Clearance:** Ethics of this research were obtained from the Ethics Polytechnic Commission of the Ministry of Health of Manado, Manado, Indonesia.

**References**


The Role of Inflammatory Markers in the Development of the Osteoporosis in Women after Menopausal

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Abstract

Background: Osteoporosis is a porous bone. It is common disease of bones, and causes insufficient bone formation or loss of bone mineral density(BMD), making the bones more susceptible to fractures. The aim of the current study is to determine the role of inflammatory makers in women with osteoporosis after menopausal ,this biomarkers include the ; Interleukin-1β(IL -1β)and Resistin.

Patient and Method: According to case-control study. This study was conducted at DEXA (dual-energy x-ray absorptiometry) Unit in Radiology Department in Al-Sader teaching hospital in AL-Najaf province / Iraq from to know the prevalence of osteoporosis in Iraqi menopausal women. A total number of the study include (88) women involved in this studyp. IL -1β , Resistin and estrogen were measurement by using a solid phase enzyme-linked immunosorbent assay (ELISA).

Result: In current study showed a significant decrease (p< 0.05) in level of serum estrogen, calcium and phosphorus in menopausal women with osteoporosis compared with healthy group. The biomarker show a significant increase (p< 0.05) in the concentration of IL-1β and Resistin in menopausal women with osteoporosis compared with healthy group.

Conclusion: In this study found the role of immunity after menopausal and relation to osteoporosis through measured the level of IL-1β and Rsisten which increase after menopausal and activation of the bone resorption.

Keyword: resistin, Menopausal, estrogen (E2) , IL-1β, BMD.

Introduction

Osteoporosis (OP) is a osteometabolic chronic, progressive disease characterized by a deterioration of bone microarchitecture and reduction in bone mineral density(BMD), which leading to mechanical fragility and ready to spontaneous and traumatic fractures¹. The causes of osteoporosis is increase breakdown of bone structure, decrease in bone formation, or an imbalance between the activity of bone cells responsible for bone remodeling, which excessive the number or activity of osteoclasts and reduction in number or activity of osteoblasts². Postmenopausal women considered most cases of osteoporosis due to estrogen deficiency. Fractures of osteoporosis occurs in spine and hip therefore considered high morbidity and mortality¹. Fractures in osteoporosis affect the muscle and the skeletal systems, cause loss of functional capacity, chronic pain, and compromise quality of life¹. Menopause is an irreversible and universal process, that result from loss of ovarian sensitivity to gonadotropin stimulation , this part of the overall aging process⁵.

The immune system has a strong association with bone metabolism⁶. For example, interleukin (IL)-6 promotes osteoclast differentiation and activation⁷. IL-1 is another potent stimulator of bone resorption⁸. The IL-1 family of ligands includes 11 members and among them IL-1β emerged as the primary therapeutic target for an expanding number of inflammatory conditions. The inactive IL-1β precursor is cleaved by caspase-1 via a protein complex called inflammasome into an active cytokine, IL-1β binds type I (IL-1RI) and type II (IL-1RII) specific receptors⁹. IL-1β is a strong stimulator of
in vitro and in vivo bone resorption. IL-1β upregulates the production of RANKL enhancing its activity and stimulating osteoclastogenesis. IL-1β also regulates the production of osteoprotegerin (OPG), a natural inhibitor of RANKL. OPG inhibits osteoclast differentiation by binding RANKL. IL-1β increases prostaglandin synthesis in bone.

Human resistin is a 12.5 kDa cysteine rich peptide with a mature sequence composed of 108 amino acid. The site of resistin gene found on chromosome 19, Human resistin plays important role in the regulatory of inflammatory response, during which macrophages, peripheral blood mononuclear cells (PBMC), and vascular cells are the primary targets of resistin. Resistin regulation of expression of pro-inflammatory cytokines such as TNF-α, IL-6, IL-12, and monocyte chemoattractant protein (MCP)-1 in PBMCs, macrophages, and hepatic stellate cells via the nuclear factor-κB (NF-κB) pathway. Resistin expression has also been identified in the non-adipocyte fibrotic livers and atherosclerotic lesions. Moreover, circulating resistin concentration are associated with inflammatory and fibrinolytic markers such as C-reactive protein (CRP).

Material and Method

This study was conducted in the research from Al-Sader teaching hospital in AL-Najaf province from DEXA unit in the Radiology Department, Fractures and Joints Department and in laboratories of Biology Department/ Faculty of Sciences/ University of Kufa, during the period from. The samples tested were 88 samples which divided to control group were 20 samples, 68 samples from menopausal women patients.

Biochemical Parameters

Specific kit for measuring human Calcium and phosphate concentrations in serum by spectrophotometer was supplied by Biolabo SA, France. Another specific kits were using to measuring Interleukin-1β level and Resistin level by ELISA technic supplied by Elabscience Biotechnology, while serum estradiol level supplied by CALBIOTECH, China.

Statistical Analysis:

The well-known statistical system (Graph Pad prism ver. 5) was adopted, and the analysis of variance table one – way anova (by Tukey’s multiple comparisons test) was used for the comparison among subdivided groups in the measured parameters. The results were expressed as (Mean ± Stander Error). The comparison between subgroups was analysed by t-test.

Results

The results in figure 1 and 2 reveal statistically significant differences of menopausal women with osteoporosis compared with Healthy group, there was significant decreased (p<0.05) in BMD and t-scores in (MO) compared with Healthy group in menopausal women.

![Figure 1: BMD and T-scores in spin between menopausal women with osteoporosis group and healthy group.](image)

![Figure 2: BMD and T-scores in right femur between menopausal women with osteoporosis group and healthy group.](image)

Table 1 revealed significant differences in minerals and hormonal between MO and healthy groups, that show significant decrease in the E2, Ca and Pi. The significant was found (the mean values ± the standard errors) in the serum. The results in figures 3 and 4 exhibit significant increase (p<0.05) in serum levels of RETN and IL-1β in POM group compared with in HT group.
Table (1): Comparisons of hormonal evidence between osteoporosis and healthy

<table>
<thead>
<tr>
<th>Groups</th>
<th>Aspect</th>
<th>Mean ±S.E.</th>
<th>Healthy group n=20</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMO n=68</td>
<td>E2 (pg/ml)</td>
<td>15.46 ± 1.747*</td>
<td>22.70 ± 2.687</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Healthy group n=20</td>
<td>Ca mg/dl</td>
<td>8.19 ± 0.076*</td>
<td>9.15 ± 0.124</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Pi mg/dl</td>
<td>2.059 ± 0.04423*</td>
<td>2.985 ± 0.1203</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

Discussion

The results of the study revealed that the bone density data from a DEXA scan are reported as decrease in BMD and T-scores in menopausal women with osteoporosis when compared to healthy women. In this study shown an age-dependent decrease in BMD was seen in women in age groups and most in postmenopausal age were found to have low BMD of osteoporotic range; This result is similar to20,21. The study of 22 showed the major determinant of bone strength was bone mass and, after reaching peak values in the third decade of life, bone mass and density begins to decline until age 60-6522.

The age 56–60 and 46–50 years which notice in women a quick reduced in BMD, with a maximum bone reduction occurring at 51–55 years, and a decelerated reduced in BMD after 56–60 years23. This study noticed that the DEXA, which gives criteria for the diagnosis of osteoporosis and the related with risks fractures24. In this study show the DXAE most common test to diagnosis of the osteoporosis but not show the reason of the osteoporosis, therefore; suggest using the biochemical test. The results of this study have revealed a significant decrease (P<0.05) in serum estrogen in menopausal women with osteoporosis more than healthy women. This result agree with 25, 26,27.
In the menopause, estrogen concentration rapidly decreases, therefore women have a hypo-estrogenic state\textsuperscript{28} consequently, the exposure to estrogen during these key periods may dramatically affect a woman’s bone health\textsuperscript{29}. The estrogens are able to block bone resorption through two mechanisms: both by direct interaction with osteocytes and osteoclast and by regulation of T-cell and osteoblast formation and activity\textsuperscript{30,31}. The common effects of estrogen deprivation lead to an obvious induced of bone resorption and a period of quick bone loss that is major for the beginning of osteoporosis in postmenopausal\textsuperscript{32}. Combined effects of estrogen deprivation cause a marked stimulation\textsuperscript{33}. The results of this study have revealed a significant increase (P<0.05) in serum IL-1β. Pro-inflammatory cytokines (IL-1β and IL-6) were significantly elevated in patients than controls, consistent with other studies that induct the association between osteoporosis and inflammation\textsuperscript{34}. Inflammatory cytokines produce from the Innate and adaptive immunity cells which not only perpetuate inflammation but also may activate bone degradation and inhibit bone formation and causes diseases in women before menopause\textsuperscript{41}, the degree of the inflammation correlates with the extent of local and systemic bone loss\textsuperscript{35}. Pro-inflammatory cytokines may participate to bone loss by osteoclasts which activated by receptor activator of nuclear factor κB ligand (RANKL) leading to osteoporosis\textsuperscript{36}. Target cell for IL 1β is the osteoclast that provides an important stimulus the formation and activity of osteoclasts, resulting to elevated bone resorption, found of osteoblast and stromal cells was critical in the formation of osteoclasts by IL-1β\textsuperscript{37}. IL-1β may also act in the formation of osteoclasts by nuclear factor kappa-light-chain-enhancer of activated B cells and prevents its apoptosis\textsuperscript{38}. Resistin play a role in bone remodeling\textsuperscript{39}. The study have observed moderate correlations between resistin and a marker of increased osteoclast activity\textsuperscript{40}. Resistin have important role in bone metabolism by stimulating osteoblast and osteoclast differentiation, possibly through the nuclear factor kappa B (NF-kB) pathway\textsuperscript{41}.

The loss of ovarian function lead to deficiency estrogen in postmenopausal women which promote signaling and gene expression cascade of major pro-inflammatory cytokines that directly induce early osteoclast precursor formation\textsuperscript{42}.

Significance Statements

In this study found the role of immunity after menopausal and relation to osteoporosis through measured the level of IL-1β and Rsisten which increase after menopausal and activation of the bone resorption. This study is the first clinical study in Iraq.

Conflict of Interest: There was no any conflict of interest in this study.

Funding: There was no fund in this study.

Ethical: There was no conflict of interest in this study.

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39. Forsblad d’Elia H, Pullerits R, Carlsten H and Bokarewa M. Resistin in serum is associated with higher levels of IL-1Ra in post-menopausal women with rheumatoid arthritis. Rheumatology. 2008; 47(7), 1082-1087.


The Relation Between Serum Concentration of High Mobility Group Box-1 Protein with Some Criteria in Metabolic Syndrome Patients

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²Biology Department, Collage of Science, University of Kufa, Iraq

Abstract

Metabolic syndrome (MetS) is a worldwide distributed public health problem and its incident in increase. (MetS) is characterized by clustering of several metabolic abnormalities, including central (intra-abdominal) obesity, dyslipidemia, hyperglycemia, and hypertension. The ultimate importance of this cluster is to identify individuals at high risk of both type 2 diabetes and cardiovascular disease. High-mobility group box-1 protein (HMGB1) plays an important role in alarming of inflammation and immunity response processes. The aim of the current study is to evaluate the serum level of high mobility group box-1 protein (HMGB1) biomarker levels in MetS patients regarding to MetS risk factors, age, gender and BMI.

Method: This study was conducted at Diabetes and Endocrinology Unit in Al-Sader Teaching Hospital in AL-Najaf province /Iraq from January2018 to July 2018 to know the prevalence of metabolic syndrome patients who attended the hospital for monthly checkup. A total of the (130) participant involved in this study, blood samples had been taken from the (90) metabolic syndrome patients (50 female and 40 male), and from (40) individual who were apparently healthy as a control group. The age, gender, WC and BMI of patients and control is taken during physical exam lipid profile and blood glucose also estimated for all groups. HMGB-1 protein biomarker in serum was measured by using a solid phase enzyme-linked immunosorbent assay (ELISA).

Result: The result of the current study have revealed a significant increase in concentration of serum HMGB-1 in MetS compared to healthy group. There was significant increase in the serum concentration of The HMGB-1 in Mets female group compared to in Mets male group. In regard to BMI, the results indicated a significant difference (p>0.05) in serum HMGB-1 concentration at different BMI (over and obese weight) between female and male Mets patients respectively in same the BMI. Regarding waist circumference, significant increase has been found in serum level of HMGB-1 in Mets patients.

Keyword: Metabolic syndrome (MetS), high mobility group box-1 protein (HMGB1), age , gender , BMI, waist circumference and lipid profile

Introduction

The metabolic syndrome (MetS) is a collection of several metabolic abnormalities, including central obesity, dyslipidemia and hypertension. The individuals with three of these abnormalities are at high risk of both type 2 diabetes and cardiovascular disease (CVD) (¹). MetS is also a state of chronic low-grade inflammation as a consequence of complex interplay between genetic and environmental factors (²). Since obesity is associated with a chronic low-grade inflammation and inflammatory pathways could be critical in the mechanisms underlying obesity-related metabolic diseases (³). In addition to adipocytes, other cells located in adipose tissue such as endothelial cells, fibroblasts, and immune cells may

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secrete inflammatory peptides and chemokines. In particular, high-mobility group box-1 protein (HMGB1), a 30 kDa nuclear and cytosolic ubiquitous protein, is actively secreted by innate immune cells and it has been shown to stimulate necrosis-induced inflammation (4). The proinflammatory cytokines promote inflammation and insulin resistance acting in autocrine, paracrine, and endocrine manners in adipose and other target tissues (5).

Previously, it has been shown that HMGB1 interacts with toll-like receptor 2 (TLR2), TLR4, and the receptor for advanced glycation end products, (RAGE) inducing immunostimulatory and chemotactic responses and triggering receptor expressed on myeloid cells (TREM)-1 (a cell surface receptor) is recognized as a potent amplifier of acute and chronic inflammation plays an important role in the pathogenesis of chronic inflammation (6). It has been recently proposed that HMGB1 may represent a diagnostic marker for obesity-related complications in children. Moreover, obesity is associated with an increased expression of HMGB1 in subcutaneous adipose tissue (4). Elevated HMGB-1 levels in serum have been found in acute inflammatory conditions. HMGB1 is found to be released from cell to act as a damage associated molecular pattern (DAMP) (7).

Since TLRs and RAGE belong to a family of pattern recognition receptors (PRRs) which recognize (DAMPs), that is strongly involved in insulin resistance and (T2DM) (8). Chronic inflammation in obesity may lead to insulin resistance and TREM-1 may play a potential role in inducing obesity IR (9). MetS also resulting from chronic exposure to elevated levels of free fatty acids and lipopolysaccharides which stimulates TREM1-induced activation of TLRs receptor cascade in lipid rafts lead to more HMGB1 associated with TREM-1, TLRs and RAGE (10). Hyperlipidemia and dyslipidemia may involved directly in the inflammation process and mediator in atherosclerotic coronary artery diseases (11). In the current study we aimed to do further investigation about the relation between high level of HMGB-1 protein and MetS risk factor hyperlipidemia, dyslipidemia, obesity and hyperglycemia in regarding to age and gender of Iraqi metabolic syndrome patients.

Material and Method

Patient and control groups

A total of 130 participants were enrolled in this study. In particular, 90 patients subjects 50 women divided according to age to (13 mean age 40-49 year), (25 mean age 50-59 years) and (12 mean age 60-69 year) and 40 men who also divided according to age to (10 mean age 49-59), (20 mean age 50-59 year) and (10 mean age 60-69 year) who had been previously diagnosed with metabolic syndrome by physicians at the Endocrinology and Diabetes Unit at Al-Sader Teaching Hospital in AL-Najaf province / Iraq and they were attended the center regularly for monthly check up, during the period from January 2018 to July 2018. According to BMI patients subject divided to over, morbid and obese and according to W.C subject divided to three group; (100-119 cm), (120-139 cm) and (140-160 cm). Exclusion criteria included: endocrine diseases (other than diabetes or impaired glucose tolerance (IGT)); syndromic obesity; hepatic, infectious; craniopharyngioma. Anti-inflammation drug consuming patient. Forty healthy (20 male and 20 female) were enrolled as controls (control group). Subjects had to be normal weight. Apart from obesity, inclusion/exclusion criteria were identical to those used for the obese group. The study protocol was approved by the Hospital’s Ethics Committee. Written informed consent was obtained from the patients and control.

Blood samples collection

Five ml of venous blood was acquired by antecubital venipuncture utilizing needle drained from Mets and control subjects between 8:30-10 AM following 12 hours fasting. The blood was permitted to clot in plain test tube at room temperature. The serum was suctioned after centrifugation at 3000rpm for 10 min, divided into aliquots in epindroff tubes and stored at -20°C for measurements of levels of glucose, lipid profile and HMGB-1 protein.

Biochemical analyses

Total cholesterol measured use (Biolabo SA, France), (HDL) (Biolabo SA, France), TG concentrations (Biolabo SA, France). Calculation of (LDL) was calculated by this formula: LDL(mg/ml)=TC(mg/dl) − HDL(mg/dl). Calculation of blood glucose by (Biolabo SA, France). Determination of serum High mobility group protein B1 level. Specifickit for measuring human HMGB1 concentrations in serum was supplied by (Biomatik, Ontario, Canada. Catalogue No: EKF57253)
Results

Characteristics of the population

The results in table (1) revealed significant differences in lipid profile between Mets group and healthy group, significantly increased (p<0.05) in serum cholesterol, TG-C and LDL-C compared with healthy group, while a significant decrease (P<0.05) in serum HDL-C concentration of Mets compared with HG. The results of same table revealed significant differences in lipid profile between Mets female group and Mets male group, significantly increased (p<0.05) in serum TGand LDL-C in female Mets group compared with male Mets group, while a significant decrease (P<0.05) in serum HDL-C concentration of female compared with male Mets group.

Statistical analyses

Statistical analysis was performed with IBM SPSS version 23 software by use of the t test. and ANOVA ,P<0.05 was regarded as indicative of statistical significance.

Table (1): Comparison of lipid profile between females and males Mets patients and HT group

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean ±S.E.</th>
<th>Female</th>
<th>Control</th>
<th>Male</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
<td>Control</td>
<td>Patient</td>
<td>Control</td>
</tr>
<tr>
<td>Cholesterol mg/dl</td>
<td>267.18±1.33 *</td>
<td>155.65±1.41</td>
<td>263.47±1.42*</td>
<td>161.70±1.63</td>
<td></td>
</tr>
<tr>
<td>TG mg/dl</td>
<td>185.24±0.36* a</td>
<td>123.85±0.73</td>
<td>184.82±0.34*a</td>
<td>131.80±1.20</td>
<td></td>
</tr>
<tr>
<td>HDL-C mg/dl</td>
<td>41.18±0.36*b</td>
<td>64.80±0.83</td>
<td>42.92±0.46*b</td>
<td>64.80±0.96</td>
<td></td>
</tr>
<tr>
<td>LDL-C mg/dl</td>
<td>192.28±0.60* c</td>
<td>123.75±0.61</td>
<td>189.65±0.63*c</td>
<td>121.40±0.60</td>
<td></td>
</tr>
</tbody>
</table>

Comparison of HMGB1 level between patients and control

HMGB1 levels were statistically higher in Mets patients than in the control group. The result in figures (1) exhibit significant increase (p<0.05) in serum levels of Hmgb1 in Mets patients groups in compared with in control groups (healthy persons) respectively.

HMGB-1 levels in MetS female patients and MetS male patients groups

The result in figures (2) revealed a significant increase (p<0.05) in serum HMGB-1, concentration in Mets female group and in compared with in Mets male group respectively.

Comparison of HMGB1 among different age groups of Mets patients.

The results of figure (3) reveal there is significant increase in serum Hmgb1 level in Mets female patients when compared with Mets male group at same age group.
in (40-49y) and (60-69y), and there is no significant difference (p<0.05) in serum Hmgb1 in Mets female patients when compared with Mets male group at same age group in (50.59y). Also, the same figure showed there is no significant difference in serum Hmgb1 level Mets when compare among different ages (40-49y) (50-59y) (60-69y) in female group and male group.

Comparison of HMGB-1 among different body mass index (BMI) groups of Mets patients.

The results of figure (4) indicate there is a significant difference (p>0.05) in serum HMGB-1 concentration at different BMI (over and obese weight) as compared between female and male Mets patients in same BMI while there is no significant difference between the female and male patient groups in morbid weight of BMI. The same figure showed there is a significant difference (p>0.05) in serum HMGB1 concentration as compared between different BMI (over and obese weight) of female patients groups.

Comparison of HMGB-1 level among different waist circumference groups of Mets patients.

The results of figure (5) reveal there is significant increase in serum, Hmgb1 level in Mets female patients with WC between (140-160 cm) as compared with the male patient in the same WC. The same figure also showed significant deference in Hmgb1 level Mets male with WC between (100-119 cm) as compared with Mets male group with WC between (120-139 cm).

Discussion

The present study indicates an elevation of HMGB1 serum level of Mets patients in comparison with healthy group. According to study by Jilal et al (13); HMGB1 significantly increased in MetS patients in compared with control which secreting from adipose tissue for Mets patients and these engage to the TRLs found in these tissues and other tissue that contributing to the pro-inflammatory state and insulin resistant state. Another previous study has been shown that adipocytes of obese individual undergo regular necrosis upon stressful damage, leading to releasing of cellular contents like HMGB-1 more HMGB1, leading to recruitment of additional immune cells, and induces adipocyte death. HMGB-1 play important role in the maintenance of long-term inflammatory state in adipose tissue (14). The present study revealed a significant increase in serum HMGB1 among female MetS patients in comparison with Mets male patients with in the same age group in (40-49y) and (60-69y), A cording to study by Vitseva et al; (15) demonstrate that TLRs are inducible in adipose tissue of obese women with high BMI and associated central obesity with high waist circumference in age group (40-50y) and that why HMGB1 level is higher in women at this age groups.

The results of this study also indicate there is a significant difference (p>0.05) in serum HMGB1 level at different BMI (over and obese weight) as compared between female and male Mets patients in same BMI. And between female patient groups there’s a significant
different also indicate. HMGB-1 was found to be dependently correlated with BMI which in turn correlated with age and gender\(^{(4)}\). This study showed there is an elevation in serum, HMGB1 level in Mets female patients with WC between (100-119cm) and (120-139 cm) as compared with the male patient in the same WC while a significant deference in HMGB1 level of Mets male with WC between (100-119cm) as compared with Mets male group with WC between (120-139 cm). According to Wang et al Plasma HMGB1 levels were higher in obese subjects than those subjects with normal weight and were positively correlated with waist hip ratio(WHR) and waist circumcises\(^{(16,17,18)}\).

**Conclusion**

The present study provides that HMGB1 biomarker is strongly correlated with some of MetS risk factors like; (BMI, WC, Lipid profile, Glucose level) in regarding to age and gender and also demonstrated that women population is more effected with MetS risk factors than men population in our community. HMGB1 may be considered as good biomarker for diagnosis and detect early symptom of metabolic syndrome and also can-do further research for consider HMGB1 as pharmaticular target for limitation of MetS risk factors threatening on public health.

**Conflict of Interest:** There was no any conflict of interest in this study

**Funding:** There was no fund in this study

Ethical was According to the Declaration of Helsinki issued by the World Medical Association, formulated in experimental protocols and independent (ethics committees approval university of kufa /college of Medicine

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The Polluted Dug Water from Batik Industry as Determinants of Higher Content of Lead (Pb) in Blood

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²Faculty of Medicine, Universitas Diponegoro, Semarang - Indonesia,
³Faculty of Social and Political Sciences, Universitas Diponegoro, Semarang - Indonesia,
⁴Ministry of Health Polytechnic Semarang, Indonesia

Abstract

Background: This study aims to analyze the impact of pollution of batik wastewater on dug well water in the center of the batik industry in Pekalongan City. The significant result of the coloring process with synthetic/chemical dyes containing heavy metals. One of the dominant heavy metals in batik waste is lead (Pb). Puddles of waste on residential settlements have the potential to pollute the environment in the event of infiltration and enter into community wells.

Methodology: This research is descriptive analytic with quantitative methods with cross-sectional approach. This study explored the source of Pb heavy metals from the start of waste, wastewater, well water. The waste samples were taken from the beginning of the batik industry site along with the pool of waste around 67 waste samples.

Results: The level of pollution of batik wastewater to the dug well water was quite high, as much as 60.5% of dug well water contained Pb exceeding the maximum permissible limit. It is recommended to prioritize the handling and management of batik industry waste starting from the source of batik producers.

Conclusion: There is a total of 29.9% of the pool of wastewater in open channels of residential settlements has a Pb content exceeding the specified wastewater quality standard.

Keywords: lead waste, batik, well water, heavy metal

Introduction

One type of industry that has the potential to pollute the environment is the batik industry. The batik process in the batik industry includes the stages of painting, night closure, coloring, breakdown, washing, and drying using raw materials of gray cloth, synthetic dyes, wax/night, energy and water. Each household batik industry on an average per year uses 10,950 kg of batik wax, gray cloth 182,880 meters, H₂O₂ 1600 Liter, boarding 2000 Kg, Teepol 200 Kg. The batik production process for household scale requires an average of 15,000 liters of water, 10 liters of kerosene. Whereas for a year the wax is wasted 12.5%, the product fails 9,144 meters, H₂O₂ is scattered 200 Liters, Kostik is scattered 24 Kg, wastewater 80% of the water used, Teepol is scattered 10 Kg, coloring agent 50, 4 Kg. Still, very little industry batik which uses natural dyes that do not pollute the environment.

According to data from the Jenggot Village, there were 905 households (82.95%) out of 1,091 homes that used dig well as a source of clean water. The researcher has carried out preliminary research by taking 15 water samples from dug wells located in residential locations that are located near five inundation points of wastewater in the sewers in the settlement. From several parameters that are directly related to health, namely Cd, Total Cr, and Pb, only Lead content (Pb) exceeds the quality standard for both wastewater and clean water. The Pb level in the wastewater in the ditch inundation

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reaches > 0.7 mg / L and the Pb level in the well water reaches 0.04 mg / L from the standard quality set at 0.01 mg / L. This shows the real existence of environmental pollution in the area of Jenggot Village, mainly related to heavy metal Lead (Pb). Whereas as a source of drinking water, the quality of groundwater in these shallow wells must meet drinking water quality standards based on Regulation of the Minister of Health No. 492 of 2010.

Based on the results of the preliminary study, it is necessary to study the effect of batik wastewater that is directly discharged to the environment on decreasing groundwater quality due to Pb heavy metals in dug wells located in the center of Jenggot Village batik industry, Pekalongan Selatan District.

**Method**

The study was carried out at the Jenggot Batik Industrial Center in Pekalongan City, Central Java Province. The study was conducted in 7 (seven) months from October 2017 to April 2018.

This research is a type of descriptive research analytic with a quantitative approach. The quantitative approach is carried out by using the Cross-Sectional survey method in the form of research in the field to obtain the value of several variables in the form of facts from existing symptoms and to find factual information in the Batik Jenggot Industrial Center. Sampling is done using the Purposive sampling method. The sampling technique chosen in this study based on consideration consists of types of industries. For all types of batik industry to be represented, a sample of 67 batik industries were selected as research samples.

**Results**

Out of the 67 batik industries that have the most are Printing batik industry of 20 sectors (29.9%) in addition to printing and screen printing with the same amount of 12 (17.9%) respectively. The variety of types of products from the existing batik industry also results in differences in the use of production materials, especially the coloring materials used. Most of them used synthetic or chemical dyes. Besides, some use a trademark, and some use more than two types of brands. Based on preliminary table research, it shows that almost the entire batik industry in Jenggot (95.53%) of producers dispose of their waste directly into residential settlements without being processed first.

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 0.03 mg / L</td>
<td>17</td>
<td>25.4</td>
</tr>
<tr>
<td>&lt;= 0.03 mg / L</td>
<td>50</td>
<td>74.6</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 1. Wastewater category based on Pb content

Table 2 above shows that as many as 25.4% of wastewater is discharged directly into settlement channels by the batik industry exceeding the specified wastewater quality standards. Based on the table according to the Decree of the Minister of Environment Number 115 of 2003, it shows that the wastewater falls into the category of heavily polluted because of the number > 10. This result shows that the wastewater does not meet as a water source for the category I to IV water classes.

The existence of puddles of batik wastewater on residential settlement channels indicates contamination in water sources, especially dug well water which is around the pool of wastewater. This is due to the process of infiltration of contaminants into the soil. For this reason, a sample of dug well water is taken around the pool of waste from the closest distance to the furthest. Each inundation point is taken at least three samples.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 5 meters</td>
<td>18</td>
<td>8.6</td>
</tr>
<tr>
<td>&gt; 5 - 10 meters</td>
<td>62</td>
<td>29.5</td>
</tr>
<tr>
<td>&gt; 10 meters</td>
<td>130</td>
<td>61.9</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2. Distribution of Wells based on Distance with Inundation

Table 2 above shows that as many as 38.1% of wells are at a less safe distance to the source of pollution and 61.9% at a safe distance of > 10 meters to pollutant sources.

The quality of the dug well water in the center of the Jenggot batik industry seen from the Pb content is illustrated in the following table:
Table 3. Distribution of dug well water based on Pb

<table>
<thead>
<tr>
<th>Pb Content</th>
<th>Amount</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 0.01 mg / L</td>
<td>83</td>
<td>39.5</td>
</tr>
<tr>
<td>&gt; 0.01 mg / L</td>
<td>127</td>
<td>60.5</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>100.0</td>
</tr>
</tbody>
</table>

From table 3 shows that as much as 60.5% of dug well water has Pb exceeding the maximum permissible limit. The average Pb level in well water of 0.0316 mg / L indicates that the content exceeds 300% of the permissible level.

The measurement results of the Pollution Index on the content of the digging well water Pb get the number 7.47, indicating that the pool of wastewater falls into the medium polluted category because the number is in the range of 5-10.

Discussion

The batik industry is a very potential industry to produce waste dangerous with heavy metal content which is quite high and causes pollution of the water environment (1). The batik industry wastewater in the Batik Jenggot Industrial Center can be categorized into three, namely stamp batik, writing, and printing or screen printing. The resulting batik waste is known to be very dangerous and contains heavy metals because it uses chemical dyes. The chemical coloring agent is synthetic and will produce liquid waste containing oil and inorganic dyes that are very difficult to decompose (2).

Dyes synthetic material that is commonly used in the batik industry in Jenggot village contains several heavy metals so that wastewater, water puddles on the surface and groundwater polluted by heavy metals, among others: Lead (Pb), cadmium (Cd) and Chromium (Cr). As a result, batik industrial wastewater becomes rich in heavy metal content. Direct disposal of huge waste without treatment in the area around the batik industry location results in soil and groundwater around waste disposal contaminated by heavy metals such as Pb, Cd, and Cr (3).

Lead Content (Pb) in Wastewater Outlet

The results of the analysis of 67 samples of wastewater discharged at outlets in the Jenggot batik industry center showed the results of 25.4% of samples containing lead (Pb) of more than 0.03 mg / L with a pollution index of 13.93. Lead (Pb) is a chemical element that is inorganic in the form of inorganic salts that are insoluble in water, and are toxic (4). Pb ranks first in grouping compounds with significant and toxic effects on human health by the US Agency for Toxic Substances and Disease Registry.

The presence of Pb in a liquid waste can be a severe problem of the human body because Pb is also a systemic poison. Pb poisoning will cause symptoms of metallic taste in the mouth, black lines on the gums, anorexia, vomiting, clicks, encephalitis, wrist drop, irritability, personality changes, paralysis, blindness, and in acute poisoning, will occur meningitis cerebral, followed by stupor, coma, and death. Some previous studies stated that Pb is a type of high priority pollutant found in batik industrial waste (5).

Lead Content (Pb) in Channel Inundation Open.

Based on the results of observations on open channels in residential areas, liquid waste disposed of by the batik industry does not flow well during the dry season resulting in a pool of liquid waste. During the rainy season, the inundation conditions do not cause many problems because wastewater also decomposes in the flow of rainwater. The results of the water quality test in the inundation in the residential settlement channel showed an average Pb content of 0.04 or twice the average Pb content in the outlet, with 29.9% of the waterlogged sample exceeding the specified water quality standard criteria and including in the category of moderate contamination with contamination rates of 7.55. The Pb content in stagnant wastewater in residential channels is higher than that of outlets suspected to be due to continuous accumulation of liquid waste.

The types of industries whose wastes most often pollute groundwater with heavy metals include the metal industry, textile, leather tanning, paint and coloring materials, and the electricity industry. The accumulation of heavy metals in the soil will change the physical and chemical characteristics of the land. One of the heavy metals used as the primary study object in this study was lead (Pb) (6).
The content of Lead (Pb) in Well Water.

Residents around the center of the Jenggot batik industry are known to use dug well water as a source of clean water supply for their daily lives. Therefore the dug wells should meet physical specifications following government standards so that the quality of groundwater in dug wells is not polluted and safe for consumption. Based on observations on 210 samples of drilled wells in residential areas around the Jenggot batik industry center, the location of 61.9% of dug wells was more than 10 m from pollutant sources. Digging wells could be said to be safe from pollution if they were more than 10 m away from pollutant sources.

In addition to the superiority of its physicochemical properties, Pb utilization continues, plus its properties which cannot be decomposed biologically cause its content in the environment to accumulate with increasing danger potential (7). Groundwater can also be contaminated by heavy metals because of the effects of continuous leaching. Contamination of groundwater by heavy metals is a serious threat to human health and the environment (8),(9),(10).

The results of the analysis of Pb content in groundwater in 210 dug wells belonging to residents around the center of the Jenggot batik industry indicate that, as many as 127 (60.5%) dug wells on average contain Pb as much as 0.316 mg / L with a pollution index of Pb content of 7.47. Based on these results, 60.5% of dug wells cannot be used in daily life because the Pb content exceeds 300%. The maximum limit of Pb levels allowed according to the Regulation of the Minister of Health of the Republic of Indonesia groundwater in 60.5% of the dug wells was included in the medium polluted category because the numbers were in the range of 5 - 10.

In comparison, the well water was dug in the Soko Duwet village area which was not an industrial center of batik and had no soil porosity different from the center of the Jenggot batik industry, after being analyzed the average contains Pb of 0.005 with a pollution index of Pb content of 0.87. Based on these results, 60.5% of dug wells cannot be used in daily life because the Pb content exceeds 300%. The maximum limit of Pb levels allowed according to the Regulation of the Minister of Health of the Republic of Indonesia groundwater in 60.5% of the dug wells was included in the medium polluted category because the numbers were in the range of 5 - 10.

The observation results showed that there were differences in Pb levels in well water dug in the rainy and dry seasons. In the rainy season, the Pb level in the dug well groundwater is 0.01 mg / L which means lower than in the dry season of 0.04 mg / L. This is following the previous research that, concluded the water quality of wells dug differently in the rainy and dry seasons. During the rainy season, there is an increase in the volume of permeate groundwater which has reduced the concentration of existing pollutants, whereas in the dry season the amount of wastewater will be more dominant compared to rainwater, causing water quality to be weak and an increase in heavy metal content in water.

Conclusion

The average Pb content in batik wastewater taken from batik industry outlets is 0.0216 mg / L, and 25.4% of wastewater from outlets that are disposed of directly to settlements by the batik industry exceeds the specified wastewater quality standard. There is a total of 29.9% of the pool of wastewater in open channels of living arrangements has a Pb content exceeding the defined wastewater quality standard. The average Pb level in dug well water is 0.0316 mg / L. The lowest Pb level is 0.0023 mg / L and the highest is 0.1461 mg / L. As much as 60.5% of the dug well water contains Pb exceeding the maximum permissible limit of 0.01 mg / L.

Ethical Clearance: Ethical clearance was obtained from the University of Diponegoro Semarang. We also wish to thank all the participants who contributed to this study.

Conflict of Interest: Nil.

Source of Funding: Nil.

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The Relation between Serum Concentration of Paraoxonase-1 Enzyme with Some Criteria in Metabolic Syndrome Patients

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²Biology department, College of science, University of Kufa, Iraq.

Abstract

Metabolic syndrome (MetS) is a worldwide distributed public health problem and its incidence in increase. (MetS) is characterized by clustering of several metabolic abnormalities, including central (intra-abdominal) obesity, dyslipidemia, hyperglycemia, and hypertension. The ultimate importance of this cluster is to identify individuals at high risk of both type 2 diabetes and cardiovascular disease (CVD). PON1 an antioxidant enzyme carried by HDL, it can hydrolyze lipid peroxide in lipoproteins as a result of its lipolactonase activity thereby decreasing oxidative stress in serum lipoproteins, macrophages, and atherosclerotic lesions. The aim of the current study is to evaluate the serum level of paraoxonase -1 biomarker levels in MetS patients regarding to MetS risk factors, age and gender.

Method: This study was conducted at Diabetes and Endocrinology Unit in Al-Sader Teaching Hospital in AL-Najaf province /Iraq from January2018 to July 2018 to know the prevalence of metabolic syndrome patients who attended the hospital for monthly checkup. A total of the (130) participant involved in this study, blood samples had been taken from the (90) metabolic syndrome patients (50 female and 40 male), and from (40) individual who were apparently healthy as a control group. The age, gender, WC and BMI of patients and control is taken during physical exam lipid profile and blood glucose also estimated for all groups. PON-1 enzyme biomarker in serum was measured by using a solid phase enzyme-linked immunosorbent assay (ELISA).

Result: The result of the current study showed a significant decrease in concentration of serum PON-1 in metabolic syndrome patients in compared with healthy group. The PON-1 biomarker revealed a significant increase in the serum concentration in Mets female group in compared with in Mets male group respectively on the other hand the study show there is a significant difference in serum PON-1 level in Mets females patients when compared with Mets male group at same age group in (40-49y). Significantly increase in PON1 of Mets female patients with WC group in (140-160cm) as compared with the male patient in the same WC while, no significant increase in serum PON-1 level among other study groups.

Keyword: Metabolic syndrome (MetS), Paraoxonase-1, age, gender, BMI, waist circumference and lipid profile

Introduction

The metabolic syndrome (MetS) is a collection of several metabolic abnormalities, including central obesity, dyslipidemia, hyperglycemia, and hypertension¹. The individuals with three of these abnormalities are at high risk of both type 2 diabetes and cardiovascular disease (CVD). Reactive oxygen species (ROS) are oxygen-containing molecules that produced during normal metabolism (free radical). When the production of damaging (ROS) exceeds the capacity of the body’s antioxidant defenses to detoxify them, a condition known as oxidative stress occurs which can cause tissue damage, particularly in the endothelial tissue². Lipids are a major target of free radical attack, which induces lipid peroxidation. Free radical induced
peroxidation of cellular membrane damage. Because it leads to alterations in the biophysical properties of the membrane. Therefore, measurement of products of lipid peroxidation has been commonly used to assess oxidative stress (3). Blood high-density lipoprotein (HDL) levels are inversely correlated with oxidative stress with this beneficial effect of HDL being partly attributed to its antioxidant properties mediated by paraoxonase -1 (PON1) (4). PON1 an antioxidant enzyme carried by HDL it can hydrolyze lipid peroxide in lipoproteins as a result of its lipo lactonase activity thereby decreasing oxidative stress in serum lipoproteins, macrophages, and atherosclerotic lesions. The early atherosclerotic lesion is characterized by macrophage foam cells, filled with cholesterol, oxysterols and oxidized lipids (6). Therefore, PON-1 protects lipoproteins and arterial cells against oxidation, probably by hydrolyzing lipid peroxides and preventing the formation of foam cells accumulation (7). PON1 was found to use efficiently not only lipoprotein-associated peroxides (including cholesteryl linoleate hydroperoxides), but also hydrogen peroxide (H2O2). PON1 inhibits the accumulation of peroxynitrite-generated oxidized phospholipids by its ability to hydrolyze phosphatidylcholine (PC) core aldehydes and PC isoprostanes to yield lysophosphatidylcholine (8). Because of reducing hydroxide and cholesteryl linoleate hydperoxide in LDL, it is considered that PON1 has an activity like peroxidase. Thus HDL-PON may play an important role in the prevention of atherosclerosis (9). In the current study we aimed to do further investigation about the relation between low level of paraoxonase-1 enzyme and MetS risk factors hyperlipidemia, dyslipidemia, obesity and hyperglycemia in regarding to age and gender of Iraqi metabolic syndrome patients

Material and Method

Patient and control groups

A total of 130 participant were enrolled in the study. In particular, 90 patients subjects 50 women divided according to age to (13 mean age 40-49year),(25 mean age 50-59 years) and (12 mean age 60-69 year) and 40 men who also divided according to age to (10 mean age 49-59), (20 mean age 50-59year) and (10 mean age 60-69year) who had been previously diagnosed with metabolic syndrome by physicians at the Endocrinology and Diabetes Unit at Al-Sader Teaching Hospital in AL-Najaf province / Iraq and they were attended the center regularly for monthly check up , during the period from January 2018 to July 2018. According to BMI patients subject divided to over, morbid and obese and according to waist circumference subject divided to three group; (100-119cm), (120-139cm) and (140-160). Exclusion criteria included: endocrine diseases (other than diabetes or impaired glucose tolerance (IGT)); syndromic obesity; hepatic, infectious; craniopharyngioma. Anti-inflammation drug consuming patient. Forty healthy (20 male and 20 female) were enrolled as controls (control group). Subjects had to be normal weight. Apart from obesity, inclusion/exclusion criteria were identical to those used for the obese group. The study protocol was approved by the Hospital’s Ethics Committee. Written informed consent was obtained from the patients and control.

Blood samples collection

Five ml of venous blood was acquired by antecubital venipuncture utilizing needle drained from Mets and control subjects between 8:30-10 AM following 12 hours fasting. The blood was permitted to clot in plain test tube at room temperature. The serum was suctioned after centrifugation at 3000 rpm for 10 min, divided into aliquots in epindroff tubes and stored at-20°c. for measurements of levels of glucose, lipid profile and PON-enzyme.

Biochemical analyses

Total cholesterol (TC) measured use (Biolabo SA, France), high density lipoprotein (HDL) (Biolabo SA, France), TG concentrations (Biolabo SA, France). Calculation of low density lipoprotein (LDL). Low density lipoprotein was calculated by this formula: LDL (mg/ml)=TC(mg/dl) ─ HDL(mg/dl). Calculation of blood glucose by (Biolabo SA, France). Determination of serum High mobility group protein B1 level. specific kit for measuring human PON-1 concentrations in serum was supplied by (Biomatik, Ontario, Canada. Catalogue No: EKE61260

Statistical analyses

Statistical analysis was performed with IBM SPSS version 23 software by use of the t test and ANOVA P <0.05 was regarded as indicative of statistical significance

Results

Characteristics of the population The main Clinical characteristic of Mets patient according to gender group
are summarized in Table 1. The results showed a significant (P<0.05) increase in BMI between male Mets patients (36.51±5.7) kg/m² when compared with female Mets patient group (31±5) kg/m², both groups are subdivided according BMI into overweight, obese weight and morbid weight. Also, the results reveal statistically significant differences of female compared with male, there was a significant increased (p<0.05) in W.C of female compared with male patient with metabolic syndrome and there is a significant increase (p<0.05) in fasting blood glucose level of Mets females as compared with Mets males group at same age group.

The results in Table 2 revealed significant differences in lipid profile between Mets group and healthy group, significantly increased (p<0.05) in serum cholesterol, triglycerides, TG-C and LDL-C compared with healthy group, while a significant decrease (P<0.05) in serum HDL-C concentration of Mets compared with healthy group. The results of same table revealed significant differences in lipid profile between Mets female group and Mets male group, significantly increased (p<0.05) in serum triglycerides and LDL-C female Mets group compared with male Mets group, while a significant decrease (P<0.05) in serum HDL-C.

**Table (1): Clinical characteristic of Met patients according to gender groups**

<table>
<thead>
<tr>
<th>Clinical characteristic</th>
<th>Groups</th>
<th>Mean ± S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females N=50 (55.55%)</td>
<td>Males N=40 (44.44%)</td>
</tr>
<tr>
<td>Age (year) (Mean ± SE)</td>
<td>53.67 ±1.04</td>
<td>56.34±1.83</td>
</tr>
<tr>
<td>(40-49y) NO. (%)</td>
<td>13(14.44%)</td>
<td>12(13.33%)</td>
</tr>
<tr>
<td>(50-59y) NO. (%)</td>
<td>25(24.44%)</td>
<td>18(20%)</td>
</tr>
<tr>
<td>(60-69y) NO. (%)</td>
<td>12(16.66%)</td>
<td>10(11.11%)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>36 ±5.7</td>
<td>31 ±5*</td>
</tr>
<tr>
<td>Over weight NO. (%)</td>
<td>10(11.11%)</td>
<td>10(11.11%)</td>
</tr>
<tr>
<td>Obese weight NO. (%)</td>
<td>30(30%)</td>
<td>20(22.22%)</td>
</tr>
<tr>
<td>Morbid weight NO. (%)</td>
<td>10(14.44%)</td>
<td>10(11.11%)</td>
</tr>
<tr>
<td>WC (Mean ± SE) (100_119)</td>
<td>122.01±2.58*</td>
<td>110.07±3.46</td>
</tr>
<tr>
<td>(120-139)</td>
<td>20(22.22%)</td>
<td>15(16.66%)</td>
</tr>
<tr>
<td>(140-160)</td>
<td>10(11.11%)</td>
<td>10(11.11%)</td>
</tr>
<tr>
<td>Fasting blood glucose</td>
<td>360.26±66.40 *</td>
<td>312.70± 8.94</td>
</tr>
</tbody>
</table>

**Figure (1): Comparison of PON1 level between Mets patients and control group**
### Table 2: Comparison of serum level lipid profile between females and males Mets patients and HT group

<table>
<thead>
<tr>
<th>Lipid profile</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient</td>
<td>Control</td>
</tr>
<tr>
<td>Cholesterol mg/dl</td>
<td>267.18±1.33 *</td>
<td>155.65±1.41</td>
</tr>
<tr>
<td>TG mg/dl</td>
<td>185.24±0.36* a</td>
<td>123.85±0.73</td>
</tr>
<tr>
<td>HDL-C mg/dl</td>
<td>41.18±0.36*b</td>
<td>64.80±0.83</td>
</tr>
<tr>
<td>LDL-C mg/dl</td>
<td>192.28±0.60* c</td>
<td>123.75±0.61</td>
</tr>
</tbody>
</table>

Figure (2): Comparison of serum PON1 level between males and females of Mets patients

**Comparison of PON1 between Mets patient and control in both male and female.**

The result in figure (1) exhibit significant decrees (p<0.05) in serum levels of PON1 group compared with control groups.

Comparison of PON-1 between Mets males and females patients figure (2) revealed a significant increase (p<0.05) in serum PON1 concentration in Mets female group and in compared with in Mets male group respectively.

Comparison of biomarkers among different age groups of Mets patients

Figure (3) show a significantly increase (p<0.05) in serum concentrations of PON1 of Mets females patients when compared with Mets males group at the same age group in (40-49y), while there are no significant differences in serum concentrations of PON1 between females and males groups in the same age (50-59 y) and (60-69 y). The same figure indicated there is no significant differences in serum concentrations of PON1 when compared among different ages (40-49y) (50-59 y) (60-69 y) in females group and male group.

**Comparison of PON1 among different waist circumference groups of Mets patients.**

Figure (4) show a significantly increase (p<0.05) in serum concentrations of PON1 of Mets females patients with WC group in (140-160cm) as compared with the males patients in the same WC while, no significant increase in serum PON1level among other study group.
Discussion

The results of this study exhibit a significant decrease (p<0.05) in serum levels of paraoxonase-1 (PON1) in MetS patients group compared with control groups. PON1 is a HDL-associated, pleiotropic enzyme and may play a role in several different pathways: from the protection against oxidative damage and lipid peroxidation to the contribution to innate immunity processes and from the detoxification of reactive molecules (10). More specifically, PON1 is capable of protecting lipoproteins from lipid peroxidation by degrading specific oxidized cholesteryl esters and phospholipids, and antioxidant properties of HDL have been attributed, at least partially, to PON1 (11). The decrease level of PON1 may play important role in metabolic peroxidation of LDL-C several studies have been found several mechanism to discussed the decreased in PON-1 level connected with increased LDL-C lead to inactivation of Pon-1 level by interaction with free sulfhydryl group and oxidized LDL also a high level of (CD/LD) lipid peroxidation were increased with decrease Pon-1 (12,13). Several studies has been suggested that imbalance between oxidant and anti-oxidant was impaired as a severity of metabolic syndrome so the increase oxidation stress and low antioxidant were detected in patient with metabolic syndrome (14). A recent study has been investigated the hydrolytic activity of PON-1 towards lactones (cycle esters) is considered an active also cytokines and oxidized phospholipid reduced both PON-1 expression and activity (15). Martinelli et al.,(2011) observed a progressive decrease of paraoxonase activity by increasing the number of MS disturbances . Concomitantly, a progressive increase of lipid peroxides concentration was observed, and a greater degree of severity of MetS is associated with an increased oxidative stress which inactivates PON1 function (16).

The current study also revealed a significant increase (p<0.05) in serum P1 concentration in Mets female group in compared with Mets male group respectively. Males have been more likely to have atherosclerosis and decrease in the PON1 activity than females (16). Also, the results of this study indicate that the PON1 concentration in serum independent on age of male and female in all study groups. The result of current study indicate no significant difference in serum level PON1 at different BMI (over, obese, morbid weight) groups of Mets patients while show a significantly increase (p<0.05) in serum concentrations of PON1of Mets female patients with WC (140-160cm) as compared with the male patient in the same WC while, no significant increase in serum PON1 level among other study groups. (17,18)

Conclusion

The present study provides that paraoxonase-1 enzyme is correlated with some of MetS risk factors like; (WC, Lipid profile) in regarding to age and gender and also demonstrated that women population is more effected with MetS risk factors than men population in our community. PON-1 may be considered as good biomarker for diagnosis and detect early symptoms of metabolic syndrome and also can-do further research for consider PON1as pharmaticular target for limitation of MetS risk factors threatening on public health. The study protocol was approved by the Hospital’s Ethics Committee. Written informed consent was obtained from the patients and control.

Conflict of Interest: There was no any conflict of interest in this study

Funding: There was no fund in this study

Ethical was According to the Declaration of Helsinki issued by the World Medical Association, formulated in experimental protocols and independent (ethics committees approval university of kufa /college of Medicine

References


Prevalence and Correlates between Game Addiction and Stress of Adolescents in Chiang Mai, Thailand

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1Department of Occupational Therapy, Faculty of Associated Medical Sciences, Chiang Mai University, Chiang Mai, Thailand, 2Faculty of Education, Chiang Mai University, Chiang Mai, Thailand

Abstract

Objective: This research had the objectives of studying the prevalence and relationship between game playing behavior and stress of lower secondary school students using the sample group of 242 students of the lower secondary school students of the Chiang Mai University Demonstration School.

Method: The research tools consisted of a questionnaire for demographic characteristics, Game Addiction Screening Test (GAST) for children and adolescents, the Suanprung Stress Test as well as statistical analysis involving frequency, percentile, standard deviation, and the Pearson’s Product Moment Correlation Coefficient.

Results: The results showed correlation coefficient as follows: (1) Preoccupation with the game and stress had no relationship. (2) Loss of control in game playing and stress had very little relationship, whereas the correlation coefficient was 0.15 and statistical significance was 0.05 (3) Function impairment and stress also had little relationship whereas the correlation coefficient was 0.221 and the statistical significance was 0.01 and (4) Game playing behavior and stress had very little relationship as well whereas the correlation coefficient was 0.159 and the statistical significance was 0.05.

Keywords: Game Addiction, Game Playing Behavior, Stress, Adolescents, Thailand

Introduction

Nowadays, technology has inevitably played a great role in our lives whether in our daily life, work or even in entertainment. Game addiction (GA) has become a serious mental health condition in many countries 1-3. We are able to make good use of it. But at the same time, it has also created some negative impacts on the users that like online game 4-9. One of them is game addiction when man is unable to control himself and this affects people’s relationships and life conduct. It is a legitimate leisure activity worldwide 10. Game playing is evidently very popular and interesting as it is a dream world with beautiful desirable imagination. High technology has been employed to create all sorts of games, to create virtual reality. This results in children being addicted to games more and more. Some of them might want to escape from the world of reality due to family problems, stress, friends making them want to exclude themselves from society and it can affect their responsibility as well 11. Some had problems with concentration on their study, skipping school to play games, alienating themselves from society or such inappropriate behavior as telling lies, stealing and violence. However, some studies showed some advantages to game playing such as reduction stress and loneliness, providing fun and keeping people from drugs or sex obsession so they could spend their time righteously 12.

From the statistics on Thai teenagers becoming addicted to online games 7. Some children (10-15% of the students in Thailand) were so addicted to it that they...
could not stop playing it. A survey remarkably showed that Thai children played online games via mobile phones and the Internet as long as 3.1 hours a day, number one in Asia. They spent over 60.7 minutes per day playing games. It was also found that 54% of them had mental health problems, stress and degraded learning, 27.2% engaged in gambling, 19% were in debt and unable to quit, 14% had family problems, 9% suffered social and family relationship problems and 4%-5% committed suicide due to game playing during their teens, the stage between childhood and adulthood in particular which is a transition period from being children to adults, a very sensitive period for all kinds of problems to easily emerge when all kinds of development changes occur very quickly. A more recent study also revealed some impacts of social online sites on a person’s identity development as reflected in some game playing. As such, this researcher became interested in studying the relationship between game playing behavior and stress of the lower secondary school students of Chiang Mai University Demonstration School with the expectation of obtaining the results that would provide guidance to promote and prevent game playing and stress including appropriate spending of time on game playing as well as building suitable readiness for their development and their age.

Materials and Method

Study Design: A cross sectional study design was used.

Population and Sample: Sample 242 high school students from 626 population of Chiang Mai University Demonstration School in Chiang Mai, Thailand based on the table by Krejcie RV, & Morgan, D.W.

Instruments

Game Addiction Screening Test: GAST: developed by Ratchanakarin Institute of Child and Adolescent Mental Health and the Child and Adolescent Psychiatry Department, Faculty of Medicine Siriraj Hospital.

Suanprung Stress Test-20, SPST–20: developed by Suanprung Hospital, Department of Mental Health.

Analysis Methods: Descriptive statistics and inferential statistical analysis involved Pearson’s Product Moment Correlation Coefficient.

Ethical Clearance: The research ethics committee of the Faculty of Associated Medical Sciences of Chiang Mai University for project number AMSEC-60EX-070.

Findings

Table 1: Game playing behavior of sample (n=242)

<table>
<thead>
<tr>
<th>Game playing behavior</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin of game playing</td>
<td></td>
</tr>
<tr>
<td>Introduced by friends</td>
<td>152 (62.8)</td>
</tr>
<tr>
<td>Introduced by relatives</td>
<td>56 (23.1)</td>
</tr>
<tr>
<td>Imitating others</td>
<td>53 (21.9)</td>
</tr>
<tr>
<td>Self-initiated</td>
<td>166 (68.6)</td>
</tr>
<tr>
<td>Other</td>
<td>19 (7.9)</td>
</tr>
<tr>
<td>Type of game</td>
<td></td>
</tr>
<tr>
<td>Action/fighting game</td>
<td>159 (65.7)</td>
</tr>
<tr>
<td>Strategy game</td>
<td>141 (58.3)</td>
</tr>
<tr>
<td>Adventure game</td>
<td>116 (47.9)</td>
</tr>
<tr>
<td>Sports game</td>
<td>62 (25.6)</td>
</tr>
<tr>
<td>Simulation game</td>
<td>135 (55.8)</td>
</tr>
<tr>
<td>Other</td>
<td>43 (17.8)</td>
</tr>
<tr>
<td>Tools for game access</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>145 (59.9)</td>
</tr>
<tr>
<td>Smart phone</td>
<td>224 (92.6)</td>
</tr>
<tr>
<td>Tablet</td>
<td>72 (29.8)</td>
</tr>
<tr>
<td>Portable game machine</td>
<td>22 (9.1)</td>
</tr>
<tr>
<td>Video game/Play station</td>
<td>28 (11.6)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (4.1)</td>
</tr>
</tbody>
</table>
Cont... Table 1: Game playing behavior of sample (n=242)

<table>
<thead>
<tr>
<th>Place for playing games</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>228 (94.2)</td>
</tr>
<tr>
<td>Dormitory</td>
<td>23 (9.5)</td>
</tr>
<tr>
<td>Game shop</td>
<td>20 (8.3)</td>
</tr>
<tr>
<td>School</td>
<td>185 (76.4)</td>
</tr>
<tr>
<td>Other</td>
<td>14 (5.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of game playing per week</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>15 (6.2)</td>
</tr>
<tr>
<td>1-2 days a week</td>
<td>48 (19.8)</td>
</tr>
<tr>
<td>3-4 days a week</td>
<td>40 (16.5)</td>
</tr>
<tr>
<td>5-6 days a week</td>
<td>32 (13.2)</td>
</tr>
<tr>
<td>Every day</td>
<td>107 (44.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of game play on each day</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday-Friday</td>
<td></td>
</tr>
<tr>
<td>Less than one hour</td>
<td>90 (37.2)</td>
</tr>
<tr>
<td>1-2 hours each time</td>
<td>92 (38)</td>
</tr>
<tr>
<td>3-4 hours each time</td>
<td>36 (14.9)</td>
</tr>
<tr>
<td>5-6 hours each time</td>
<td>6 (2.5)</td>
</tr>
<tr>
<td>7 hours each time</td>
<td>4 (1.7)</td>
</tr>
<tr>
<td>No answer</td>
<td>14 (5.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of game play on each day</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday - Sunday</td>
<td></td>
</tr>
<tr>
<td>Less than one hour</td>
<td>47 (19.4)</td>
</tr>
<tr>
<td>1-2 hours each time</td>
<td>78 (32.2)</td>
</tr>
<tr>
<td>3-4 hours each time</td>
<td>64 (26.4)</td>
</tr>
<tr>
<td>5-6 hours each time</td>
<td>19 (7.9)</td>
</tr>
<tr>
<td>7 hours each time</td>
<td>20 (8.3)</td>
</tr>
<tr>
<td>No answer</td>
<td>14 (5.8)</td>
</tr>
</tbody>
</table>

Game Playing Behavior

Table 2: Levels of game addiction (n=242)

<table>
<thead>
<tr>
<th>Playing behavior of sample group</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>193 (79.8)</td>
</tr>
<tr>
<td>Obsessive</td>
<td>35 (14.4)</td>
</tr>
<tr>
<td>Likely addicted</td>
<td>14 (5.8)</td>
</tr>
</tbody>
</table>

Table 3: Levels of game addiction classified by sex (n=242)

<table>
<thead>
<tr>
<th>Playing behavior</th>
<th>Levels of game addiction</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Obsessive</td>
</tr>
<tr>
<td></td>
<td>Number (Percent)</td>
<td>Number (Percent)</td>
</tr>
<tr>
<td>Total</td>
<td>193 (79.8)</td>
<td>35 (14.4)</td>
</tr>
<tr>
<td>Male</td>
<td>66 (81.5)</td>
<td>12 (14.8)</td>
</tr>
<tr>
<td>Female</td>
<td>127 (78.9)</td>
<td>23 (14.3)</td>
</tr>
</tbody>
</table>

\[\text{Total} = 13.78, \text{S.D.} = 7.72\]

\[\text{Male} = 16.53, \text{S.D.} = 8.19\]

\[\text{Female} = 11.03, \text{S.D.} = 7.24\]
Stress

**Table 4: Stress level of sample group (n=242)**

<table>
<thead>
<tr>
<th>Stress level of sample group ((= 53.55, \text{S.D.} = 14.39))</th>
<th>Number (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little stress</td>
<td>3 (1.2)</td>
</tr>
<tr>
<td>Moderate stress</td>
<td>49 (20.2)</td>
</tr>
<tr>
<td>High stress</td>
<td>119 (49.2)</td>
</tr>
<tr>
<td>Severe stress</td>
<td>71 (29.3)</td>
</tr>
</tbody>
</table>

Correlation

**Table 5: Correlation between Game Playing Behavior (n=242)**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Preoccupation with the game</th>
<th>Loss of control</th>
<th>Function impairment</th>
<th>Total score of game addiction</th>
<th>Total score of stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoccupation with the game</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of control</td>
<td>.607**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function impairment</td>
<td>.519**</td>
<td>.567**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total score of game addiction</td>
<td>.885**</td>
<td>.857**</td>
<td>.774**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total score of stress</td>
<td>.071</td>
<td>.151*</td>
<td>.221**</td>
<td>.159*</td>
<td>1</td>
</tr>
</tbody>
</table>

* p<0.05, ** p<0.01

**Discussion and Conclusion**

Game playing behavior show data. (see Table 1-3) The game playing behavior can be categorized into 3 levels of game addiction. It was found that 5.8% were in likely addicted, 14.4% in obsession and 79.8% in normal, \(= 13.78, \text{S.D.} = 7.72\). Stress level found that 29.3% were in severe stress, 49.2% high stress, 20.2% moderate stress and 1.2% little stress, \(= 53.55, \text{S.D.} = 14.39\). (see Table 4)

The relationship between game playing behavior and stress was at a very low level of positivity with the correlation coefficient as follows: (3.1) Preoccupation with the game and stress had no relationship, (3.2) Loss of control in game playing and stress had very little relationship, whereas the correlation coefficient was 0.15 and statistical significance was 0.05 (3.3) Function impairment and stress also had little relationship whereas the correlation coefficient was 0.221 and the statistical significance was 0.01 and (3.4) Game playing behavior and stress had very little relationship as well whereas the correlation coefficient was 0.159 and the statistical significance was 0.05 (see Table 5) and discussed as follows:

1) The game playing behavior of the sample group could be said to be at an addiction level, 14 students or 5.8%. However, the tests showed that most of the sample group had a grade range at a normal level. Since they stayed with their parents, it was likely that they were monitored in terms of controlling the time for game playing. Most of the students played games every day but for only 1-2 hours each time. They also could spend time on other social online activities such as Facebook besides playing games.\[1-3, 13, 19-22\].
2) The study showed no relationship between preoccupation with game playing and stress. It was likely that game playing could affect the study and responsibility such as low grade, lack of concentration on the work and relationship with family members in particular, which could result in depression, anxiety and stress. However, the students seemed to spend some time in social activities online instead.

3) The study also found that the loss of control in game playing and stress had very little positive relationship, meaning that if the control on game playing was higher, the level of stress would also increase and vice versa, which means they wouldn’t be able to control themselves to play within the allotted time only or continue playing for seven hours or more. This would cause more impacts and finally result in stress. This went along with Kimberly Young’s saying that technology was both beneficial and also created negative impacts and that game players could be preoccupied with game playing and neglect their responsibilities, causing a low grade, inability to concentrate on their work, as well as lacking relationship with others, especially family members, which could cause depression, anxiety and stress.

4) Function impairment and stress were found to be of a little positive relationship and this could be affected by loss of control on game playing as well, which corresponds to Mun-Oun who said that game playing could make a child separate himself from society and affect his responsibility also. For example, it could make him neglect his study, skip class to play games, stay away from others or have other unsuitable behavior like telling lies, or stealing or worse. This corresponds to Pornnopadol C. et al. explaining that game playing affected students’ responsibilities in paying attention to their study and homework, causing them to sneak out from school or home to play games, a drop in grades, caring less for socialization and family activities, which could bring about several negative impacts and stress. There are support by Apisitwasana, N., et al. who report the program based on self-regulation and school and family participation is effective for preventing gaming addiction in students in Bangkok, Thailand.

5) As for the relationship between game playing behavior and stress among the students in the lower secondary school, it was found that the behavior had very little positive relationship with stress whereas the correlation coefficient was 0.15 and the statistical significance was 0.05. This means that the game playing behavior had a certain level of relationship with stress which could be due to several factors in terms of the students themselves, then family, friends that caused them to stay away from socialization, and then to the game playing for relaxation and better feelings as pointed out by Kannika N. et al. who said that stress was a major factor that led young people to become addicted to online games, and found that children with high stress tended to become addicted to games more, which agreed with them the causes for game playing among the youth were for relaxation and socialization. The activity programs should be developed to enhance the immunity to prevent students from becoming addicted to games by focusing on making students to be aware of the situation and to be able to manage the stress appropriately and efficiently in terms of time management from game playing and leisure activities, life skills enhancement for youth for concrete prevention and solutions.

**Data Availability:** The data used to support the findings of this study are available from the corresponding author upon request.

**Conflicts of Interest:** The authors declare that there is no conflict of interests regarding the publication of this paper.

**Acknowledgment:** The researchers would like to thank Associate Professor Chanwit Pornnopadol, M.D., for permission to use the Game Addiction Screening Test: GAST in this research.

**Source of Funding:** The authors received no financial support for the research, authorship and publication of this article.

**References**

The Effect of Mixture of Citrus Dates Juice Extract (*Phoenix dactylifera* L) on Blood Profile Changes for Post-Partum Mother

Sri Rahayu¹, Sri Wahyuni¹, Ngadiyono¹

¹The Ministry of Health Polytechnic Semarang, Indonesia

**Abstract**

**Background:** Iron is essential for maintaining the health of the body and the system for producing red blood cells. Alternative iron fulfillment for postpartum mothers is to consume vegetables or herbs that contain high iron in the food menu. This study was to determine the effect of citrus-dates juice extract (*Phoenix dactylifera* L) on changes in the blood profile of postpartum mothers.

**Method:** This study used randomized Control Group Design With pretest and post-test. The population of all postpartum mothers in the Semarang City Regional Health Center numbered 17 treatment groups and 17 control groups, taken by random cluster sampling. The independent t-test was applied to analyze the data.

**Results:** The characteristics of the respondents of the two groups were mostly reproductive, parity was almost the same between primipara and multipara. The nutritional status had a body mass index in normal conditions, and the diet was mostly good. Descriptive analysis of respondents’ blood profiles before treatment was an average hemoglobin level of 10.8 mg/dl, hematocrit value of 31.9%, mean erythrocytes of 3.70 million / mm³, platelets 227 cells / mm³. Bivariate analysis showed that there were differences in hemoglobin, hematocrit levels erythrocyte, platelets in the group given citrus date juice compared to the control group.

**Conclusion:** Citrus-dates juice extract is better in stabilizing and improving hemoglobin, hematocrit, erythrocytes, and platelets, so the need for socialization at that citrus-dates juice extract for postpartum mothers as an alternative to raise the profile of the blood.

**Keywords:** Citrus date juice, blood profile, postpartum mother, iron

**Introduction**

High morbidity and mortality in postpartum mothers are mostly caused by postpartum hemorrhage (¹). The postpartum mother needs substances needed by the body for metabolic purposes. Nutritional requirements for the post-partum is increased by 25%, which is useful for the recovery process after childbirth and to produce enough milk to nourish the baby (²).

Giving iron tablets to postpartum mothers is recommended for up to 40 days after delivery, but not all mothers consumed iron tablets given (³). This period is quite essential for health workers always monitor postpartum mothers because the implementation of a less than optimal can cause mothers to experience various problems which can even lead to complications during the post-partum, such as puerperal sepsis. Different types of foods that contain iron are critical to be consumed regularly. Iron acts as activity body that is very important, especially for maintaining the health of the body and the system of red blood cell production.

One alternative in fulfilling iron requirements in postpartum mothers is to consume vegetables or herbs that contain high iron in the food menu. Previous research reported that administration of date fruit extract amount 60-120 mg adjusted to bodyweight could increase iron levels in normal mice (⁴). Besides, other studies stated that ethanol extract from dates could increase platelet counts.
in mice. Preclinical studies have shown that dates have free radicals, antioxidants, antimutagenic, antimicrobial, anti-inflammatory, gastroprotective, hepatoprotective, nephroprotective, anticancer, and immune stimulatory activities (5).

To increase absorption of iron in the body requires an acidic atmosphere and the presence of reducing agents. For example, vitamin C contains amino acids that are useful for binding iron in the body so that iron absorption is more effective (6). To speed up the metabolic process in the absorption of iron in dates can be helped by using natural vitamin C, one of which is the content of sweet citrus fruit (Citrus Aurantium). The purpose of this study was to determine the effect of giving a combination of dates citrus juice (Phoenix dactylifera L.) to postpartum mothers to changes in hemoglobin, hematocrit, erythrocyte, and platelet levels.

Method

This type of research was experimental with a randomized control group design with pretest and posttest. The population of all postpartum mothers in the Semarang City Regional Health Center numbered 17 treatment groups and 17 control groups, taken by random cluster sampling. Data was collected by providing postpartum mothers 250 mg of dates extract and sweet citrus juice (Citrus Aurantium) 100 ml of which had been made concentrated on the first day until day 14. On the first and 14th day, an assessment of the maternal blood profile will be carried out, while the control group will be given iron tablets according to the standard. Data were analyzed by the Independent t-test, while the confounding variables were analyzed with MANCOVA.

Results

Characteristics of Respondents

Table 1. Characteristics of Respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Control</th>
<th>P *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dates Juice + Citrus (%)</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Median (min-max)</td>
<td>Median (min-max)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>29 (20-36)</td>
<td>26 (21-350)</td>
<td></td>
</tr>
<tr>
<td>Parity 1</td>
<td>9 (52.9%)</td>
<td>8 (47.1%)</td>
<td>0.542</td>
</tr>
<tr>
<td>2</td>
<td>7 (41.2%)</td>
<td>6 (35.3%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1 (5.9%)</td>
<td>3 (17.6%)</td>
<td></td>
</tr>
<tr>
<td>Education Secondary High School</td>
<td>2 (11.8%)</td>
<td>5 (29.4%)</td>
<td>0.20</td>
</tr>
<tr>
<td>Diet Good</td>
<td>10 (58.8%)</td>
<td>9 (52.9%)</td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>7 (41.2%)</td>
<td>3 (17.6%)</td>
<td></td>
</tr>
<tr>
<td>Nutritional status</td>
<td>23 (20-27)</td>
<td>22.3 (20-25)</td>
<td>0.095</td>
</tr>
<tr>
<td>p: Homogeneity test</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The respondents in the study are given the juice of the citrus dates of the two groups in reproductive age, most parity gave birth to second children. Further, education was mostly secondary or high school education with the average nutritional status was BMI 23, and dietary patterns were 58.8% in the category of good.
Analysis of Descriptive

Table 2. Blood Profile of Postpartum Mother

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Controls (Mean ± SD)</th>
<th>p</th>
</tr>
</thead>
</table>
|                   | Dates + Citrus  
|                   | (Mean ± SD)         |         |      |
| Hemoglobin        | 10.8 ± 1.36         | 11.4 ± 1.56          | 0.770|
| Hematocrit        | 31.1 ± 4.34         | 34 ± 5.17            | 0.969|
| Erythrocytes      | 3.7 ± 0.41          | 3.8 ± 0.65           | 0.095|
| Platelets         | 227 ± 58.3          | 246 ± 69             | 0.134|

p: homogeneity test

Descriptive analysis of respondents’ blood profiles before treatment on average hemoglobin was 10.8 mg/dl, for the hematocrit value in treatment was 31.1% and the control group was 34. The number of erythrocytes in the treatment group averaged 3.70 million / mm$^3$ and the platelet level averaged 227 cells / mm$^3$. The homogeneity test results show all variables with

p value > 0.05 so that both groups have the same characteristics.

Bivariate Analysis

Table 3: Differences in blood profile levels in both groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>p∞</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date Juice+ Citrus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin (mg / dl)</td>
<td>Before</td>
<td>10.8 ± 1.36</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>12 ± 1.005</td>
</tr>
<tr>
<td></td>
<td>∆</td>
<td>1.2 ± 1.005</td>
</tr>
<tr>
<td>Hematocrit (%)</td>
<td>Before</td>
<td>31.9 ± 4.34</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>35.4 ± 2.29</td>
</tr>
<tr>
<td></td>
<td>∆</td>
<td>3.5 ± 2.29</td>
</tr>
<tr>
<td>Erythrocytes (million / mm$^3$)</td>
<td>Before</td>
<td>3.70 ± 0.408</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>4.23 ± 0.458</td>
</tr>
<tr>
<td></td>
<td>∆</td>
<td>0.53 ± 0.458</td>
</tr>
<tr>
<td>Platelets (cell / mm$^3$)</td>
<td>Before</td>
<td>227 ± 58.3</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>246 ± 69</td>
</tr>
<tr>
<td></td>
<td>∆</td>
<td>19 ± 19</td>
</tr>
</tbody>
</table>

*= independent t-test and Mann Whitney
Table 3. shows there are differences in the value of hemoglobin, hematocrit, erythrocytes, and platelets between groups given juice of citrus dates with the control group, which p-value <0.05. This means that the postpartum given the juice of dates + citrus will contribute effectively to increase the value of hemoglobin, hematocrit, erythrocytes, and platelets.

**Discussion**

Hemoglobin is a protein in erythrocytes that functions as a carrier of oxygen from the lungs throughout the body. Hemoglobin also transports carbon dioxide back to the lungs to be removed from the body. Hemoglobin as a red pigmented protein contained in red blood cells functions to carry oxygen from the lungs to be carried throughout the body (7). Dates contain various nutrients that are important and beneficial for health. From previous studies mentioned dates contain high carbohydrates (total sugar, 44/88%), fat (0.2 / 0.5%), 15 salts and minerals, protein (2.3 / 5.6%), vitamins and high percentage of dietary fiber (6.4 / 11.5%) (8). Postpartum mothers need twice as much nutrition as preparation for breastfeeding and the recovery process in the puerperium (9). Previous research also stated that consuming dates Halawi versus Medjool for 100 grams/day for four weeks did not increase fasting and triacylglycerol serum glucose levels and even significantly lower serum triacylglycerol levels, so consuming dates has beneficial effects and is considered an anti-atherogenic nutrient (10).

Post-partum mother given juice of citrus dates has a hemoglobin level better than the control group because the dates contain flavonoids, vitamin and dietary fiber 6.4-11.5% (10). Flavonoids are one component that helps in the formation of hemoglobin which affects the absorption and release of iron from transferrin into body tissues. The role of flavonoids in the process of dates can inhibit the enzymatic activity of hyaluronidase in the process of decomposing hyaluronic acid, which is the primary ingredient of the bone marrow. The previous study showed that there was an influence on changes in hemoglobin levels in the 16-18 age group year who received dates (11). Some previous research also states there is an effect of giving palm juice to hemoglobin in second-trimester pregnant women (12).

In this study also obtained a better hematocrit value in the group given citrus juice extract. Decreased volume and increase in blood cells in pregnancy are associated with an increase in hematocrit and hemoglobin on day 3-7 postpartum and will be standard in 4-5 weeks postpartum.

On the first day post-partum, the levels of fibrinogen and plasma will decrease slightly, but the blood thickens with an increase in viscosity which increases blood clotting factors. Leukocytosis increased where the number of white blood cells can reach 15000 mL during labor will remain high in the first few days of postpartum. The amount of hemoglobin, hematocrit, and erythrocytes will vary significantly at the beginning of the postpartum period as a result of blood volume, placental volume and varying levels of blood volume. All these levels will be influenced by the nutritional status and hydration of the woman (13).

The value of erythrocytes in this study also showed a significant difference in postpartum mothers given citrus date juice. Red blood cells (erythrosine) are round sprawl, both surfaces are concave (biconcave), and non-nucleated, in women about 4 million / mm3. Red blood cells contain hemoglobin (red dye in the blood) which functions to bind O2, including iron (Fe), maintaining the immune system. Following previous research that giving date fruit extract can improve the system immune modulatory namely increasing the number of IFN-γ cells, CD49b, and IL-12 (14).

Mothers given citrus date juice have better platelet levels than the group control. Freezing blood cells (platelets) in the form of freezing blood platelets are not fixed. Its function for blood clotting, in the amount of about 200,000-400,000 / mm3, is made in the bone marrow (15). If a person is injured, the pieces of blood flow with the wound blood, when touching the surface of the wound it will break, and thrombokinase is formed, with the help of calcium ions it will convert prothrombin (in blood plasma) to thrombin. The formed thrombin will convert fibrinogen to fibrin (fine threads) which will close the wound so that the bleeding stops (16). In postpartum women who are given juice of citrus dates will be a faster recovery process of the puerperium because citrus dates juice can increase blood platelet levels (17). In another study, Ajwa date palm fruit extract contained active antioxidants such as polyphenols, flavonoids, and flavones with positive effects on protecting various tissues and warding off free radicals with antioxidants (18). To improve the recovery process of postpartum maternal tissue, substances that can help improve maternal health.
status are needed so that dates can be one of the best alternatives for postpartum mothers.

Date palm fruit combined with baby java citrus contributes well in stabilizing the blood profile of postpartum mothers, especially hemoglobin, hematocrit, erythrocytes, and platelets, because of the components of flavonoids in dates. All types of flavonoids are metabolized in the same way, which is transformed into aglycone compounds and hydrolysis processes, which occur in the stomach and most importantly occur in the proximal colon by regular flora-flora activity and produce beta-glucosidase (19). To sum up, this method can become an alternative instead of massaging which is commonly applied among Indonesian women (20), (21).

**Conclusion**

The characteristics of the two study groups were mostly reproductive age, and their education was secondary, parity mostly gave birth to the second, while nutritional status had a healthy BMI and adequate diet. There are differences in hemoglobin, hematocrit, erythrocyte, and platelet levels in postpartum mothers given citrus date juice with a control group. Citrus date juice contributes better in stabilizing and increasing levels of hemoglobin, hematocrit, erythrocyte and thrombocyte in postpartum mothers so that there is a need for socialization to postpartum mothers, about the utilization of citrus date juice as an alternative to increasing maternal blood profile besides midwives as one of the health workers can provide information to the public.

**Ethical Clearance:** Ethical clearance was obtained from The Ministry of Health Polytechnic Semarang, Indonesia. We also wish to thank all the participants who contributed to this study.

**Conflict of Interest:** Nil.

**Source of funding:** Nil.

**References**


Effect of Blood Iron Level on Prevalence of Recurrent Aphthous Stomatitis (RAS) in Traffic Police Officers

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Abstract

Introduction: Iron is one of human micronutrients which is the most abundant micro mineral in the body. Iron deficiency can affect the human immune system because this mineral is essential for cell differentiation and growth. In addition, white blood cells that function to destroy bacteria becomes unable to work effectively and will result in changes in oral microorganisms which can increase intensity of oral mucosa inflammation including recurrent aphthous stomatitis (RAS). This study aimed to determine the association between blood iron levels and recurrent aphthous stomatitis in traffic police officers at Surabaya Police Department.

Materials and Method: This research was an analytical observational with cross sectional approach. The respondents of this research were 98 traffic police officers at Surabaya Police Department, they were selected by simple random sampling method by fulfilling several criteria. Researchers then performed intra oral examination and anamnesis to know the history of ulceration in the mouth of the respondents.

Results: Respondents who had abnormal iron levels experienced RAS more than respondents with normal iron levels. The correlation test between iron blood level of and RAS with chi-square test resulted in P-value of 0.034. Because the p-value (0.034) is less than significance level (0.05), the null hypothesis is rejected. Thus, this means that there is a relationship between blood iron levels and RAS.

Conclusion: There is relationship between blood iron levels and Recurrent aphthous stomatitis in traffic police officers at Surabaya Police Department.

Keywords: Stomatitis Aphthous, Fe blood level, police, lead poisoning

Introduction

Iron is one of the essential human micronutrients which is the most abundant micro mineral in the body. It is essential for survival. The ability to obtain, store and use iron is a universal requirement for all organisms¹.

Iron is absorbed through the duodenal mucosa. Iron levels in the body are affected by iron absorption rate. Factors affecting iron absorption rate are, amount and form of iron, ascorbic acid, phytic acid, tannin, gastric pH level, iron requirement level and intrinsic factors such as body iron requirement level². In addition, Pb or lead in high amount and frequency can also affect the iron absorption process. Lead is a direct competitor of iron on the bonding site at the duodenal receptors. Therefore, people who experience lead poisoning will be accompanied by iron deficiency. Consistent with this, iron deficiency can exacerbate lead poisoning in the body³.

Chronic or continuous iron absorption disorder will lead to a state of iron deficiency in the body⁴. Iron
deficiency can affect the immune system of the individual because iron is essential for cell differentiation and growth. In addition, in the state of iron deficiency, white blood cells that function to destroy bacteria becomes unable to work effectively. Reduced bactericidal substances produced by the body result in changes in oral microorganisms. This change causes increasing intensity of oral mucosa inflammation including recurrent aphthous stomatitis (RAS).

Traffic police officers are the implementing element of traffic regulation. Traffic is a major factor supporting productivity in modern society to improve the quality of life of the community. In order to support these tasks, nutritional adequacy is needed to achieve excellent health. The oral cavity with a variety of normal flora inside is very sensitive to changes in the immune response. Oral infections can serve as a marker for subclinical malnutrition. Based on the above background, this study aimed to determine the association between blood iron levels and recurrent aphthous stomatitis (RAS) in traffic police officers at Surabaya Police Department.

**Subjects and Method**

This research was an analytical observational with cross sectional approach. The respondents of this research were 98 traffic police officers at Surabaya Police Department, they were selected by simple random sampling method by fulfilling criteria of physical and mental health, not taking drugs, willing to do blood examination to obtain blood levels of iron and willing to be interviewed about meal and Recurrent Aphthous Stomatitis frequency. Participants first filled the informed concern then proceeded to the blood sampling. Blood sample was obtained as much as 3 ml in the cubital vein using EDTA as anticoagulant. Then it was inserted into the tube and stored in cold storage with temperature maintained about 4°C. The levels of iron and pb in blood were measured using atomic absorption spectrophotometer (SSA) method with μ/l unit. Respondents were asked about the frequency of consumption of iron, vitamin C sources consumption, tannin sources consumption, and general data through interviews using questionnaire. Researchers then performed intra oral examination and anamnesis to know the history of ulceration in the mouth of the respondents.

**Findings**

This research was conducted on traffic police officers at Surabaya Police Department with 98 respondents. The average age of respondents was 37.3 years with an average working life of 15.5 years. RAS-affected respondents accounted for 14.28% of total respondents with average blood Fe and blood Pb 938.61 μ / l and 146.71 respectively. Characteristics of respondents are described in table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Mean</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>82</td>
<td>-</td>
<td>83,67</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td>-</td>
<td>16,32</td>
</tr>
<tr>
<td>Age (25-64 y.o)</td>
<td>-</td>
<td>37,3</td>
<td></td>
</tr>
<tr>
<td>Job Position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Officer</td>
<td>49</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Administrative officer</td>
<td>49</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Work Period (year)</td>
<td>15,5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>14</td>
<td>14,28</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>84</td>
<td>85,71</td>
<td></td>
</tr>
<tr>
<td>Fe Whole Blood (μ/l)</td>
<td>938,61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pb Whole Blood (μ/l)</td>
<td>146,71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cross tabulation between Fe blood levels is divided into abnormal and normal categories with RAS in respondent is categorized as positive and negative described intable 2. The results of cross-tabulation were found that from 16 people who had abnormal iron levels, 31.3% experienced RAS and from 82 people who had normal iron levels, only 11.0% was affected by RAS. Respondents who had abnormal iron levels experienced more RAS than respondents with normal iron levels. The correlation test between blood iron level and RAS with chi-square test resulted in P-value of 0.034. Because the p-value (0.034) is less than significance level (0.05), the null hypothesis is rejected. Thus, this means that there is a relationship between iron blood levels and RAS.
Table 2. Cross tabulation between Fe and Recurrent Aphthous Stomatitis (RAS)

<table>
<thead>
<tr>
<th>Fe Blood Levels</th>
<th>RAS</th>
<th>-</th>
<th>%</th>
<th>+</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal</td>
<td>11</td>
<td>68.8</td>
<td>5</td>
<td>31.3</td>
<td>16</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>73</td>
<td>89</td>
<td>9</td>
<td>11</td>
<td>82</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The correlation test was conducted on the type of food that can affect blood iron levels. Cross tabulation between Fe blood level which is divided into abnormal and normal categories and RAS which is categorized as positive and negative. They are differentiated based on frequent or rare consumption of foods containing iron, Vitamin C and Tannin as described in Table 3.

Table 3. Cross-tabulation between Fe in blood and RAS based on the variable of food consumption that affects blood iron level

<table>
<thead>
<tr>
<th>Food variable</th>
<th>Frequency</th>
<th>Fe blood level</th>
<th>RAS</th>
<th>-</th>
<th>%</th>
<th>+</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>Rare</td>
<td>Abnormal</td>
<td>10</td>
<td>19.6</td>
<td>3</td>
<td>5.88</td>
<td>13</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>33</td>
<td>64.7</td>
<td>5</td>
<td>9.8</td>
<td>38</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent</td>
<td>Abnormal</td>
<td>1</td>
<td>2.12</td>
<td>2</td>
<td>4.25</td>
<td>3</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>40</td>
<td>85.1</td>
<td>4</td>
<td>8.51</td>
<td>44</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Rare</td>
<td>Abnormal</td>
<td>6</td>
<td>10.34</td>
<td>1</td>
<td>1.72</td>
<td>7</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>44</td>
<td>75.86</td>
<td>7</td>
<td>12.06</td>
<td>51</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent</td>
<td>Abnormal</td>
<td>5</td>
<td>12.5</td>
<td>4</td>
<td>10</td>
<td>9</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>29</td>
<td>72.5</td>
<td>2</td>
<td>5</td>
<td>31</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tannin</td>
<td>Rare</td>
<td>Abnormal</td>
<td>4</td>
<td>10.26</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>29</td>
<td>74.36</td>
<td>6</td>
<td>15.38</td>
<td>35</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent</td>
<td>Abnormal</td>
<td>7</td>
<td>11.11</td>
<td>5</td>
<td>7.94</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>44</td>
<td>69.84</td>
<td>7</td>
<td>11.11</td>
<td>51</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the correlation test between the blood iron level and RAS in respondents who rarely consume Fe, chi-square test showed value of 0.396, while the relationship between blood levels of iron and RAS in respondents who often consume Fe have chi-square test value of 0.004. Because the p-value is (0.004) less than (0.05), the null hypothesis is rejected which means that there is a correlation between blood iron levels and RAS in respondents who frequently consume Fe.

In the correlation test between iron blood levels and RAS in respondents who frequently consume Vitamin C, chi-square test showed value of 0.005. Because the p-value is (0.005) < (0.05), then the null hypothesis is rejected which means that there is a correlation between blood iron levels and RAS in respondents who frequently consume Vitamin C.

In the correlation test between iron blood levels and RAS in respondents who frequently consume tannin chisquare showed test value of 0.027. Because the p-value of (0.027) < (0.05), the null hypothesis is rejected which means that there is a correlation between blood iron levels and RAS in respondents who frequently consume tannin. Risk estimation test showed value of 1.09 which means that frequent tannin-consuming traffic police officers are 1.09 times more susceptible to the incidence of RAS than those who rarely consume.
The correlation test was tested on lead in the blood and the factors of lead entry in the blood that could affect blood iron levels as described in table 4.

Table 4. Cross-tabulation between Fe in blood and RAS based on the variables of lead blood levels and the factors of lead entry in the blood.

<table>
<thead>
<tr>
<th>Pb variable</th>
<th>Fe blood level</th>
<th>RAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb Blood Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>Abnormal</td>
<td>2</td>
</tr>
<tr>
<td>Normal</td>
<td>Normal</td>
<td>31</td>
</tr>
<tr>
<td>Abnormal</td>
<td>Abnormal</td>
<td>9</td>
</tr>
<tr>
<td>Abnormal</td>
<td>Normal</td>
<td>42</td>
</tr>
<tr>
<td>Working Period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short</td>
<td>Abnormal</td>
<td>4</td>
</tr>
<tr>
<td>Short</td>
<td>Normal</td>
<td>38</td>
</tr>
<tr>
<td>Long</td>
<td>Abnormal</td>
<td>7</td>
</tr>
<tr>
<td>Long</td>
<td>Normal</td>
<td>35</td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Officers</td>
<td>Abnormal</td>
<td>7</td>
</tr>
<tr>
<td>Field Officers</td>
<td>Normal</td>
<td>44</td>
</tr>
<tr>
<td>Administrative</td>
<td>Abnormal</td>
<td>4</td>
</tr>
<tr>
<td>Administrative</td>
<td>Normal</td>
<td>34</td>
</tr>
</tbody>
</table>

Form the table, we can see that respondents who had normal iron levels and did not experience RAS were more likely occurred in normal blood Pb. In the correlation test between the correlation between blood iron levels and RAS on the respondents who had abnormal blood levels of Pb, chi-square test showed value of 0.07. Because the p-value of (0.07) ≥ (0.05), then the null hypothesis is accepted which means that there is no correlation between iron blood levels and RAS in the respondents who are abnormal blood Pb.

The result of cross tabulation between blood glucose level and RAS based on work period, respondents who had normal iron levels and did not experience RAS were more likely occurred in long working period. In the correlation test between blood iron levels and RAS on short or new working period, chi-square test value is 0.060. Because the p-value is (0.060) ≥ (0.05), the null hypothesis is accepted which means that there is no correlation between blood iron levels and RAS in the respondents whose working period is short.

The result of cross tabulation between blood levels of iron with RAS differentiated by type of position in traffic police officers found that respondents who had abnormal levels of iron and experienced RAS more likely occurred in field officers. In correlation test between blood iron levels and RAS on field officers, chi-square test showed
value of 0.000. The null hypothesis is rejected, and there is a correlation between blood iron levels and RAS in respondents whose position as field officers.

Traffic police officers assumed to have iron deficiency due to high lead exposure turned out to only 16.3% of respondents who have blood levels below normal blood levels. In fact, they are officers with lead blood value above the normal value of 58.2%. This is due to the fact that iron deficiency in the body is a terminal symptom caused by various factors such as blood loss, increased need for iron such as during growth and pregnancy condition, low iron intake from foods, iron absorption disorders and iron metabolic disorders.

In this study, respondents who had abnormal levels of iron and experienced RAS more likely in rare iron intake. This is in accordance with the literature where the main cause of iron deficiency in the blood is due to a lack of iron intake and low absorption\(^9\). The absorption of iron in the blood is influenced by other factors such as tannin and vitamin c intake. In this study the frequency of consumption of vitamin C and tannins was studied and used as a moderate variable equivalent to blood lead levels as a factor affecting iron absorption.

Respondents who had abnormal levels of iron and experienced RAS more likely occurred in respondents who often consumed Vitamin C. This is not in accordance with the literature stating that vitamin C intake from food will provide an acidic atmosphere to facilitate the reduction of ferric iron into ferro to make it easier to be absorbed in small intestine. Iron absorption in the form of nonheme increases fourfold with vitamin C presence\(^9\). In addition to helping in the iron absorption, vitamin C also plays a role in maintaining endurance if consumed adequately. This is caused by the function of vitamin C involves various aspects of metabolism such as electron transport. Administration of vitamin C meant for supportive care through tissue regeneration, thereby shorten healing time.

Another factor that affects iron absorption is tannin consumption. Tannin has polyphenolic compounds such as tannins in the tea and coffee. Tea can reduce absorption by up to 80% as a result of the formation of iron-tannate complex. Coffee also contains polyphenols but, in less amount, compared to tea\(^11\). In this study, iron inhibition due to high tannin consumption will lead to a decrease in the body’s immune system to infections that cause an increase in RAS incidence by 1.09 times higher than low tannin consumption cases.

Respondents who had normal iron levels and did not experience RAS were more likely to occur in respondents with normal Pb blood level. This is in accordance with the literature which mentioned that iron deficiency and lead poisoning should be interconnected and will occur together\(^12\). Exposure to lead can interfere with erythropoiesis which will ultimately interfere with iron absorption. Almost 50% of erythropoiesis activity is inhibited at Pb blood levels of 15 μg / dl\(^13\). In normal Pb blood level, there is no decrease in immunity that can increase the incidence of RAS. Pb blood level that affect Fe blood levels can be affected by the working period and job position of respondents. Based on the results of this study, it is found that the working period does not affect the emergence of RAS, while the position affects the occurrence of RAS. This is not in accordance with previous experiments in which both work and occupation could affect blood levels of iron. The longer the work period and duration will affect the level of lead in the blood. This is in accordance with previous research which states that long working periods will lead to longer lead exposure, therefore increasing lead levels in the blood\(^13,14,15\). Differences with previous experiments may be caused by that members of administrative officers who have long working period but possibly have lower lead exposure.s

**Conclusion**

From this study, we can conclude that there is a significant relationship between blood iron levels and Recurrent aphthous stomatitis in traffic police officers at Surabaya Police Department.

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Molecular Impact on High Motility Group Box-1 (HMGB-1) in Pamps and Damp

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Abstract

High Motility Group Box 1 (HMGB1) is a protein that is expressed constitutively in almost all types of cells. In response to microbial infections, HMGB1 is secreted from immune cells activated to regulate inflammation. Here we review the different mechanisms by which several herbal components inhibit the action or secretion of HMGB1 such as by modulating inflammatory activation, autophagic degradation, or endocytic uptake.

High Motility Group Box 1 (HMGB1) was initially identified as a DN-binding protein binding to proteins that participate in DNA replication, repair and regulation of transcription of gene expression. Although the role of HMGB1 is not well understood, recent studies characterize the emergence of extracellular HMGB1 roles as prototypical danger signals that regulate inflammatory and repair responses. In conditions of sterile infection, injury and inflammation, HMGB1 can occur passively released from damaged or active cells secreted from the immune-activated cell. Inflammasome, a caspase-1-activating large protein complex, has recently been shown to play an important role in mediating extracellular release of HMGB1 from activated and infected immune cells. High Motility Group Box 1 (HMGB1, also known as amphoterin) has been identified initially as a non histone DNA binding factor revealed by almost all eukaryotic cell nucleations.

Keyword: HMGB1, DNA, Gene, inflammation

Introduction

HMGB1 (High Motility Group Box 1), evolutionarily using a 30 kDa DNA binding protein, is then expressed in almost all cell types. Sequence (NLS), HMGB1 is transported into the nucleus by a nuclear import complex, which then retains it in the preformed protein ¹.². The HHG box allows HMGB1 to bind to chromosomal DNA and fulfill nuclear functions in stabilizing nucleosome structures and regulating gene expression. Test local HMGB expression ¹ makes animals susceptible to infection. Strengthens the role of beneficial intracellular HMGB1 in immunity to infection and injury ³. In response to infections and injuries, however, HMGB1 is secreted from immune cells that are activated or released passively from injured cells ³,⁴

Result and Discussion

Settings of HMGB1 secretion

In response to microbial products (for example,
ds-RNA, CpG-DNA, and endotoxin), macrophages / monocytes are secreted HMGB1 into the extracellular environment in a delayed manner. Because it does not have a leader peptide sequence, HMGB1 cannot be actively secreted through the classic endoplasmic reticulum - the Golgiocytocytic pathway.

Nucleus-to-cytoplasmic transcription is governed by post-rational modification (e.g., acetylation or phosphorylation) of NLS, which causes absorption from HMGB1 into cytoplasmic vesicles. The result of a protein complex, called “inflammasome”, is responsible for splitting procaspase-1 to produce caspase-1, which triggers activation inflammation and pyroptosis. Reduces inflammatory activation, pyroptosis, and HMGB1 secretion.

Structurally, HMGB1 is a 30 kDa protein consisting of two homologous DNA binding motives (called Boxes ‘A’ and ‘B’) followed by a negatively charged tail of acid at the carboxyl end. The importance of HMGB1 in regulating nuclear processes is emphasized by the phenotype of HMGB1-deficient mice, which die shortly after birth due to severe energy deficits and hypoglycemia, possibly due to impaired glucocorticoid signaling. HMGB1 induces recruitment of cell inflammation, contributing to dendritic cell maturation and for the proliferation of activated T cells.

Inflammasomes activate signaling pathways that contribute to immune responses and host defense mechanisms when they (directly or indirectly) sense the presence of certain pathogenic microbes and DAMPs in the cytosol host or in intracellular compartments. Interestingly, NLRP3 inflammasome activation has recently been shown to be important not only for the secretion of IL-1β, but also for the release of HMGB1 from LPS-primed macrophages treated with ATP or exposed to nigericin. Caspase-1 itself requires activation by large protein complexes called ‘inflammasomes’ which are assembled in NOD-like receptors (NLR) and HIN-200 protein scaffolds. NLR contains centrally located NACHT domains.

Similarly, extracellular release of HMGB1 from macrophages infected with S. typhimurium relies on activation of caspase-1 by NLRC4 inflammasome. Unlike IL-1β and IL-18, HMGB1 does not undergo caspase-1-mediated processing. HMGB1 release takes place continuously in macrophages which are less known caspase-1-substrate (IL-1β, IL-18 and caspase-7) show that caspase-1 can induce noncanonical HMGB1 and other secretions of proteins through proteolytic activation of unknown secretion devices.
HMGB1 mediated immune response

DAMPs such as HMGB1 in shedded microbes, secretory lysosomes or exosomes. In addition to mediating the non-conventional pro-inflammatory secretion of cytokines, HMGB1 has been identified as a critical hazard signal that contributes to necrotic-related inflammation.

This is illustrated by necrotic observations that cell debris from HMGB1-deficient cells significantly decreases in inducing pro-inflammatory cytokines. HMGB1 and S100 proteins. In conclusion, inflammasomes may release HMGB1 circulating through unconventional protein secretion, or as a consequence of cell lysis during pyroptosis. Depending on the pathological context, the secretion of proteins can be frankly the inflammatory masmas-mediated subtleties release signals of danger and inflammation of cytokines.

The mechanism of HMGB1 to TLR2 and TLR4 in inflammation, Autophagy and modification of DNA

HMGB1-induced immune receptor activation may involve assembling immunostimulatory complexes with endogenous or microbial co-factors. Besides RAGE, HMGB1 is recommended to induce secretion of pro-inflammatory cytokines and chemokines by inducing NF-kB signaling downstream of toll-like receptors (TLR) 2 and TLR4 activation.

Thus, extracellular HMGB1 can bind microbial components or endogenous substances released from injured tissue to induce or increase the production of inflammatory mediators during infection and in response to (sterile) trauma. An interesting question he has is how HMGB1 moves from the nucleus to reaching the extracellular environment considering that it has no classical secretion signal.

Such a signal peptide is usually needed to transport secretory proteins through the lumen of the endoplasmic reticulum (ER) to the extracellular space in the Golgi secretory vesicles. HMGB1 has been shown to be released from active LPS monocytes and cell line macrophages are consistent with its role as prototypical alarmin. Other proteins think to undergo unconventional.

5. Extracellular HMGB1 as a DAMP Molecule

After release, extracellular HMGB1 functions as a DAMP to signal, record, and activate immune cells. For example, HMGB1 binds to various PAMPs (eg, CpG DNA or LPS), thus facilitating their recognition by each receptor, and consequently increases the
inflammatory response induced by PAMPs. HMGB1 interacts with the family of cell surface receptors and binds to proteins including RAGE, TLR4, TLR9, differentiation groups 24 (CD24) / Siglec-10, Mac-1, thrombomodulin, and single transmembrane protein domains (eg, syndromes). HMGB1 contains three cysteine residues in a very sustainable position: 23, 45 and 106. Recently a consensus conference proposed an isoform nomenclature, called “HMGB1”.

HMGB1 is secreted through pyroptosis also hyperacetylated on the NLS Site. This is consistent with the understanding that HMGB1 treated with inflammation Discharge is a very regulated process. Furthermore, various types of inflammasome activation induce different HMGB1 post-translational modifications. For example, NLRP3 inflammatory stimuli, such as ATP, monosodium uric acid, and adjuvant aluminum, induce HMGB1 “disulfide” secretion; whereas activation of NLRC4 inflammasome produces very reduced HMGB1 secretion.

One possible explanation is activation of inflammation of NLRP3, but not NLRC4 inflammasome, associated with the production of mitochondrial ROS, which promotes HMGB1 oxidation and formation of C23-C45 disulfide bonds. HMGB1 redox status allow for appropriate immune response to different pathogens. HMGB1 release, which facilitates leukocyte recruitment to eliminate invading bacteria contributing to sequential leukocyte recruitment, activation, and ultimately inflammation.

**Conclusion**

High Motility Group Box 1 (HMGB1) is a protein that is expressed constitutively in almost all types of cells. In response to microbial infections, HMGB1 is secreted from immune cells activated to regulate inflammation. DAMPs such as HMGB1 in shedded microbes, secretory lysosomes or exosomes. In addition to mediating the non-conventional pro-inflammatory secretions of cytokines, DAMPs and growth factors, inflammatory activation in immune cell activation triggers the induction of a special caspase-1-mediated cell death program called pyroptosis. After being fully oxidized, HMGB1 has no chemokine or cytokine activity.

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Analysis of the Implementation of School Partnership Programs as Evaluation to Improve Education Quality

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Abstract

This study was prepared to evaluate and analyze the results of the implementation of the 2013 curriculum (K13). The aim is to provide evaluations to existing schools to make improvements in the form of solutions that can improve the ability of schools to manage. In addition, in this study, it is also expected to provide encouragement to teachers in providing optimal teaching. So that later on education that applies the 2013 curriculum can develop. This study uses a qualitative approach to evaluation research methods, applying a mixed-model model, namely Kirkpatrick and Countenance Stake. The main instruments of this study are the researchers themselves and supporting instruments in the form of interview guides, questionnaires, observation guidelines and document analysis guidelines. In general, the principal’s partnership program has a real impact on the quality development in the impact schools in the form of improving the quality of education through the exchange of knowledge and experience between partner school principals.

Keywords: Curriculum, School Principal, Evaluation.

Introduction

Leadership in all organizations including schools as a formal institution has a strategic position. In education, the principal has the authority to make plans and programs that are relevant to the school’s development needs. The success of the school is very dependent on the ability or creativity of the principal in identifying challenges and problems faced by the school and then formulating the right solution by optimizing the resources available in the education unit he leads.¹

Evaluation was a process of activities aimed at making decisions, in contrast to evaluative research designed to answer questions, test and prove hypotheses. However, both have many similarities. Among them are both of them can study the same focus or problem; use design with the same methods and techniques of measurement or data collection; can use samples with the same location or scope; using the same data analysis techniques and interpretation of results.²

Sukmadinata further explained that evaluation has two main activities, namely: (1) measurement or data collection, and (2) comparing the results of measurement and data collection with the standard used. Similarly, Dun, as quoted by Hadi and Mutrofin² says that the term evaluation has a related meaning and each refers to the application of several scale values to the results of policies and programs.

On Job Learning (OJL) is an activity to identify and analyze the implementation of the plan to improve the leadership quality of the principal. Through the mentoring mechanism, the Facilitator and Principal Partner will conduct assistance in the impacted schools that implement it for several days to collaborate as well as assist and assist the affected school principals in implementing the change agenda that has been formulated in the On the Job Learning plan. In general, the substance of the principal’s partnership program is

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curriculum management.3

**Literature Review**

**School Principal’s Partnership**

The partnership program that began in 2015 was carried out through the mechanism of exchanging partner principals with the impacted school principals and was named the Principal Leadership Comparative Study Program. The activity was attended by 1500 school principals, namely 750 school principals in affected schools and 750 school principals in partner/affecting schools. In 2016, the continuation of the program will be carried out in the form of mentoring by the Facilitator and the Principal Partner of the School Principal. The 2016 program will generally continue planning changes that have been designed at 2015 In-Service Learning-1 and On the Job Learning Workshop while identifying and analyzing the implementation of plans to improve the leadership quality of principals after the In-Service Learning-1 Workshop. Through the mentoring mechanism, the Facilitator and Principal Partner will conduct assistance in the impacted schools that implement it for several days to collaborate as well as assist and assist the affected school principals in implementing the change agenda that has been formulated in the On the Job Learning plan.4

The principal goal of the principal’s partnership is not only in the aspect of academic substance but also targeting the contextual things such as the spirit to change, the mindset of change and the spirit of togetherness that is expected to be permanently built between the partner principal and the affected headmaster. In general, the substance of the principal’s partnership program includes curriculum management, supervision of learning and strengthening the school ecosystem. Management of curriculum and supervision is basically inherent in the principal task of a school principal.5

Management of the school ecosystem includes the internal and external environment of the school or as part of the school system itself. Internally, environmental management, both physical and non-physical, is a necessity for schools, especially for school principals, in optimizing the educational outcomes targeted by schools. In addition, in the external environment of the school, the involvement of stakeholders, in this case, the community at large should be a serious concern from the principal.6,7

The impact generated by the intimate relationship between the school and the community through the effectiveness of the principal’s leadership appearance, are: (1) increasing active participation of the community in educational activities; (2) improve communication between the school and the community; (3) schools can improve school education programs whose results are really needed by the community (link and match); and (4) the possibility of increased support from the community in the form of: funding, information and political support.4

**Method**

This study used a qualitative approach with evaluation research methods that implemented a mixed-model model namely Kirkpatrick and Countenance Stake. This research was carried out in the Directorate of Education Personnel Development by selecting 100 principals as the main respondents. In addition, researchers also collected data on in-depth interviews with 20 teachers, 10 supervisors and 2 managers of the principal’s partnership program. The research process is generally described as follows:

Pre-study carried out from January-March 2016. This study is intended as an initial process to understand the problems of implementing the partnership program that began in 2015. The study was also intended to get a picture of the potential changes in the principal’s post-I leadership stage 2015.

Follow-up research conducted from July to August 2016. This continued research is at the core of implementing partnership program evaluation research. This process is a further and in-depth search of the object of research accompanied by the collection and analysis of all data related to each component of the program in accordance with the procedures, methods, and techniques that have been planned.

The main instrument of this research is the researchers themselves. However, for more effective data retrieval processes related to the focus of research, this study uses supporting instruments in the form of interview guidelines, questionnaires, observation guidelines and document analysis guidelines. For this purpose, an instrument grid and theoretical validation are arranged. Data analysis was performed using the Miles and Huberman Model, namely a qualitative analysis model through three activities or processes, namely: data
reduction, data display, and verification.

**Result**

The following are the results of research conducted on 100 principals as the main respondents. In addition, the researchers also collected data on in-depth interviews with 20 teachers, 10 supervisors and 2 managers of the principal’s partnership program as follows.

**Teacher’s Perception**

Teacher’s perception of the implementation of the 2013 curriculum since the 2 (two) years partnership program was carried out seen from 5 (five) aspects, namely: 1) Teacher’s confidence in implementing K13, 2) Enthusiasm or response of students with K13-based learning, 3) Teacher readiness to implement K13, 4) Supporting Facilities for K13-based learning, and 5) School environment support.

**School Principal’s Perception**

The impact of school principals’ perceptions is related to the implementation of K13 in their schools after 2 (two) years of partnership between principals seen from 1) teacher enthusiasm, 2) teacher readiness, 3) teacher’s efforts to continue learning, 4) school committee support.

The principal’s perception of the implementation of K13, in particular, the criteria related to teachers is quite positive even the achievement index is quite high at 0.91 and 0.95 respectively. This means that principals are quite optimistic about the application of K13, especially related to teacher factors. Even though the principal considered that the teacher did not yet have adequate readiness to implement K13 but at the same time the principal considered positively that the teacher showed enthusiasm and effort and continued to learn to implement K13 better.

In general, principals find it difficult to facilitate the implementation of the 2013 curriculum due to free school policies from local governments that do not allow schools to charge fees from the parents/community. While for the ideal, support for facilities, tools, and certain materials/media is needed for the implementation of the 2013 curriculum.

**RPP Development**

In the aspect of RPP development, it can be seen that the criteria are met and those that are not met are 3 criteria. This means that in descriptive only half of the criteria are met so that the achievement of this aspect as a whole is still far from the standard. In addition to the descriptive analysis shown in the figure above, the results of the document analysis found several problems related to the development of the RPP outlined below.

There are still indicators and learning objectives that are not right. Indicator formulation in both KI and KD is too broad and not adjusted to the subject matter. There is a formula for learning objectives that are not right, because what is described is only the process and there is no description of the results to be achieved. Learning resources seem to be written formally in the lesson plan: in general, the RPP made by the teacher includes several learning resources, but in fact only one source is available, the book. There were several RPPs that write learning resources from the internet and print media but the sources are not clearly written. The formulation of learning experiences has not yet described the real “scientific” process: most of the RPPs made by the teacher have not yet described the essence of developing creativity through the scientific approach. Some of these RPPs do not show specific learning experiences

**Study Plan Document**

Some components of teacher RPP meet the criteria and the picture above shows that there are 3 criteria that are fulfilled, namely: clearly loading the media and learning resources used, as well as the description of the material in accordance with the formulation of learning competencies to be achieved. Problems encountered through document review are the inconsistencies between written in RPP documents and supporting physical evidence, for example about learning resources that are listed as not in accordance with reality.

**Rating**

Assessment aspects are the weakest part of implementing K13 in impact schools. Although there are 2 criteria that meet the standard but the other 4 criteria are quite low. Even the teacher’s ability to make assessment rubrics related to indicators of student learning outcomes shows very low achievements. In addition, the results of the document analysis show that almost all teachers do not have a question bank. There is a collection of questions taken from various sources and not yet analyzed.
There still needs to be sufficient reinforcement for teachers’ understanding of the assessment of learning processes and outcomes. In general, teachers do not have a good understanding of the concept of authentic assessment, especially non-test assessment, and attitude assessment. The assessment instruments used by the teacher including the assessment rubric and scoring are generally less “applicable” or difficult to apply in classical judgments. There needs to be a choice of instruments that are easier to use especially in assessing aspects of attitudes and skills (not always relying on complicated rubrics).

The learning plan is not equipped with concise material. Almost all RPPs include portfolio assessments even though the results of interviews and document validation, in general, have not yet developed a portfolio and teacher assessment as a whole yet have a full and correct understanding of portfolio assessment.

Apperception of Learning

The teacher’s performance in initiating the learning process or what we know by the term apperception is generally illustrated in the following graph. The teaching and learning process including the apperception section should not be a problem for the teacher because generally, the respondents who were subject to PBM evaluation were those who already had a service period of more than 5 years. In addition, these teachers have also received support from partner school principals during in the job learning assistance.

From the results of interviews with teachers, it turns out they face difficulties when they have to put in contextual examples or elaborate examples in apperception activities and relate them consistently with the basic competencies being taught. In addition, there are still teachers who consider apperception activities not too important and they focus more on the material to be taught. Even though apperception activities are not only about how to link the past material with the material that is sedan will be taught but also how to build a classroom atmosphere. The classroom atmosphere here is related to students’ learning readiness, how to build their learning motivation, how to get their attention. Apperception can even determine the next learning process. When the teacher succeeds in challenging students’ interests and learning motivation by presenting an interesting learning context, the opportunity to manage classes and learning effectively is more open. The following table describes the conditions of the teaching and learning process in the apperception section. Apperception has not been well developed. Apperception has not been used as an entrance to develop a pleasant classroom atmosphere and learning atmosphere and inspire/motivate students to learn. Some teachers seem to be in a hurry to directly enter the learning material so that some important parts in the apperception are abandoned. Some teachers managed to display interesting shows on the apperception section but did not elaborate coherently to enter into core activities (not sequential / interrupted by core activities). The use of ICT in apperception is still very lacking (how to use the advantages of ICT with visual and sound effects that can arouse student learning interest.

Core Activities

Teacher’s ability to carry out a learning process with a scientific approach has not shown the optimal achievement. Some learning criteria have reached the standard but with relatively good results. But more than half of the criteria that have achieved are low and do not reach the standard. The following table describes the general problems faced by teachers in using the scientific approach.

Group discussions have not been well developed. Group assignments have not been formulated and activity scenarios are made so it is not clear how the process and what will be produced by the group, what will be assessed both in groups and individuals. In general, groups are not provided with clear instructions (teachers should be able to prepare instructions, scenarios, and assessments through impressions / ICT). Groups should be facilitated with shows (available on a lot of internet / Youtube). This means that teachers have not been optimal in utilizing ICT in the learning process (only limited to PPT). Teachers still need to encourage students and them to be proactive in discussing and convincing them not to fear to be wrong, most importantly how they are trained to express ideas and be critical in seeing problems. Scientific nuances are not yet strong. Some learning activities have begun to show a scientific approach but the rather weak parts are the “questioning” and “reasoning” processes that are most often missed by the teacher’s emphasis. The inquiry process tends to be weak because the teacher sometimes rushes to conclude on his own so students
lose the moment to find and conclude the results of their observations and analysis. The limitations of teacher understanding regarding learning methods and models have an impact on learning processes and outcomes that are not optimal. Teachers tend to be very attached to examples of methods and models of learning obtained in training. The interview method, for example, is very suitable for certain KDs and subjects, but the teacher does not have the understanding and experience in developing the method.

**Conclusion**

In addition to relating to learning, especially the implementation of K13, which has been detailed in detail above, the context of curricular management has also shown quite good progress. Of the 10 impacted schools that were the target of deepening partnership data in the context of the program evaluation, it was found that all of the schools in question had already formed a Curriculum Development Team which previously (before the partnership program) did not yet exist. Likewise, it relates to the curriculum itself, where all impacted schools that are participants in the partnership generally still use KTSP (Curriculum 2006) before participating in the partnership, but since 2016 gradually the schools have started to implement the 2013 curriculum.

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Factors Associated with Behavior Usage of Respiratory Protective Equipment among Sugarcane Factory Workers in Northeast of Thailand

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Abstract

Several sugar industries in Thailand are highly effected to environmental health, including a safety at work, mainly the areas surrounded of bagasse.

This research aimed to study on factors associated with behavior usage of Respiratory Protective Equipment (RPE) among sugarcane factory workers. A cross-sectional study was conducted among 588 workers at 4 sugarcane factories in Northeast of Thailand, between December 2017 to April 2018. Workers were selected by multi-stage random sampling to completed structure questionnaires. The multivariable analysis was used by multiple logistic regressions.

The majority were males (71.94%). Their mean age was 38.28 (±10.56) years old. Financial status was poor (65.65%). Department were juice extraction machine (67.52%). The majority types of RPE usage were cotton masks (94.56%) and their behaviors usage of RPE had good level (64.80%, 95%CI: 60.92-68.67). Additionally, factors associated with good behavior usage of RPE were included age (AOR= 1.65, 95%CI: 1.14 to 2.38; p=0.007), financial status (AOR= 1.57, 95%CI: 1.07 to 2.29; p=0.021) and department of work (AOR= 0.66, 95%CI: 0.31 to 1.40; p=0.017).

Almost two-third of sugarcane factory workers had good behavior usage of RPE. Work safety awareness is important to prevent and promote among sugarcane factory workers to the adaptation their working environment.

Keywords: Behavior, Bagasse, Respiratory Protective Equipment (RPE), Work-Safety.

Introduction

In Thailand, 16.8% workers are involved in manufacturing industry, normally the labor in the system preferred to work in factory and machinery operators (12). It’s impact has increased due to lack of public awareness, and exposure of workers to inferior air quality at the workplace leads to ill health(7). Personal Protective Equipment (PPE) is worn by workers(15). Nevertheless, Respiratory Protective Equipment (RPE) is not always used, even in situations with high exposure risk(13).

Therefore, The occupational health problems in the sugarcane industry had existed in more than 40 countries in the world(9). In 2016 Sugarcane on average accounts for about 80% of global sugarcane production. Production has become increasingly concentrated. The trend of top ten countries of sugarcane producing in 1980 accounted for 56%, whereas in 2016 accounted for 76% respectively. More interestingly, Thailand was third ranked after Brazil and India among top ten of sugarcane producing in the world(6). Harvesting occurs in dry season between mid-December and the end of April(8). Sugarcane industry constitutes one of the big industries,
there are 55 plants in Thailand and 20 plants in Northeast of Thailand\(^{(2)}\).

The working conditions of the sugarcane industry workers are extremely poor. The occupational health and safety issues in the workplace are significant due to the diversity of occupational safety factors. That the workers are exposed to high concentration of excessive heat, high intensity noise, high intensity of dust in cane yard section, bagasse dust in mill and bagasse baling section are the main causes of respiratory problems among these workers\(^{(10)}\). We found out that the workers at sugarcane factory have faced with health and sanitation problems because there are variety issues which do harm to their health, especially the concentration of bagasse. Inhalation of bagasse dust causes a respiratory disease called Bagassosis\(^{(11)}\).

If the workers who work in the environment which are insufficient oxygen or dusty area, the RPE is necessary indeed. It is also reducing any loss and risk to the workers because it is harmful to their health and might cause of lung cancer and respiratory deceases\(^{(4)}\). Wearing RPE could prevent respiratory deceases which be able to reduce the bagasse dust. It is an important preventive measure to their career. Anyway, it is totally safe their health if they do wear them correctly and the equipment have been in good maintenance constantly. However, the strictly usage of the RPE by workers or company or workers themselves are still the main majority issue\(^{(4)}\).

Therefore, this study aimed to investigate the factors which relate to behaviors of usage the RPE of workers in sugarcane factory. A sample group was collected from workers within Northeast of Thailand.

**Material and Method**

**Study Design and Sampling**

A cross-sectional study was conducted in 4 factories in Northeast of Thailand. Data was collected from December 2017 to April 2018. The sample size was calculated following formula\(^{(5)}\)

\[
np = \frac{n_i}{1 - \rho^{2,1,2,3,\ldots,r}}
\]

The approximate sample size was 327 which were further adjusted to control the over-fitting using the rho (\(\rho\)) of 0.50 and variance inflation factor (VIF) equal to 2.00. Therefore, the total number of the sample was 588. Data sampling processes: Firstly 4 factories in Northeast of Thailand were randomly selected. Then 3 departments facing with dusts at the working area were drawn. There were 7,965 sugarcane factory workers registered at the department of industrial work. Finally, all participants who met the inclusion criteria were randomly selected proportionally to size of the samples added to the total of 588 samples. (Figure 1).

![Figure 1. Flowchart of study design and sampling of sugar factory workers](image)

Proportionally to size of the samples added to the total of 588 samples. (Figure 1)
Questionnaires

The questionnaire was modified from reviewed literatures based on research questions. The questionnaire contained 3 parts which were: 1) Demographic Characteristics, 2) Attitude to the usage of the RPE, and 3) The behaviors of usage the RPE. The questionnaire was validated by 3 experts and tested for reliability.

Data Analysis

Descriptive and analytical statistical data were analyzed with STATA® (version.13; college Station, TX, USA: Stata Corp) was used to analyze the data. Demographic characteristics of the participants were described as frequency and percentage for categorical data; mean and standard deviation for continuous data. Inferential statistics, a simple logistic regression, was used for bivariate analysis to identify individual factors associated with good behaviors for usage of RPE. The factors that had $p$-value $<0.25$ were processed into the multivariable analysis using multiple logistic regression and reported the adjusted odds ratio (AOR) and their 95% confidence interval (95% CI) and $p$-value$<0.05$ was considered as statistically significant.

Result

Demographic Characteristics

The total 588 sugarcane factory workers in Northeast of Thailand, the majority were males in 71.94% and average age was 38.28 years with a range of 19-69, level of education was primary school, and marital status was marriage, average income each month 10,146 THB. Financial statuses were poor 65.65%. Majority it’s in juice extraction department is 67.52%, worked less than 5 years were 42.69%. Most of them get the information how to use the RPE from safety officer were 77.89%. Principally they wear cotton masks while working at factory is 94.56% (Table 1)

<table>
<thead>
<tr>
<th>Table 1: Number and percentage in personal of the workers (n=588)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
</tr>
<tr>
<td>1. Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>2. Age(years)</td>
</tr>
<tr>
<td>Mean (±SD)</td>
</tr>
<tr>
<td>Median (min : max)</td>
</tr>
<tr>
<td>3. Monthly Average income(Baht)</td>
</tr>
<tr>
<td>Mean (±SD)</td>
</tr>
<tr>
<td>Median (min : max)</td>
</tr>
<tr>
<td>4. Financial status</td>
</tr>
<tr>
<td>Poor</td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>5. Marital status</td>
</tr>
<tr>
<td>Unmarried</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>6. Education</td>
</tr>
<tr>
<td>Primary school</td>
</tr>
<tr>
<td>High school</td>
</tr>
<tr>
<td>High vocational Certificate/Diploma</td>
</tr>
<tr>
<td>7. Department</td>
</tr>
<tr>
<td>Juice extraction machine</td>
</tr>
</tbody>
</table>
### Table 1: Number and percentage in personal of the workers (n=588)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam-boilers</td>
<td>158</td>
<td>26.87</td>
</tr>
<tr>
<td>Bagasse yard</td>
<td>33</td>
<td>5.61</td>
</tr>
</tbody>
</table>

8. Working period (years)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 5</td>
<td>359</td>
<td>61.06</td>
</tr>
<tr>
<td>6-10</td>
<td>128</td>
<td>21.77</td>
</tr>
<tr>
<td>≥10</td>
<td>101</td>
<td>17.18</td>
</tr>
</tbody>
</table>

9. Source of information

<table>
<thead>
<tr>
<th>Information source</th>
<th>Number</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety officer</td>
<td>458</td>
<td>77.89</td>
</tr>
<tr>
<td>Supervisor</td>
<td>414</td>
<td>70.41</td>
</tr>
<tr>
<td>Brochure/booklet</td>
<td>87</td>
<td>14.80</td>
</tr>
<tr>
<td>Internet</td>
<td>57</td>
<td>9.69</td>
</tr>
<tr>
<td>Information board at the factory</td>
<td>219</td>
<td>37.24</td>
</tr>
</tbody>
</table>

10. Types of RPE

<table>
<thead>
<tr>
<th>Type of RPE</th>
<th>Number</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton masks</td>
<td>556</td>
<td>94.56</td>
</tr>
<tr>
<td>N95 Masks</td>
<td>137</td>
<td>23.30</td>
</tr>
<tr>
<td>Shirts</td>
<td>132</td>
<td>22.45</td>
</tr>
<tr>
<td>Loincloth</td>
<td>15</td>
<td>2.55</td>
</tr>
</tbody>
</table>

The total 588 sugarcane factory workers, majority were attitude of usage of RPE are in good level be 79.42% (95%CI: 76.14-82.70) then, medium level is 20.41% (95%CI: 17.14-23.68) and the attitude with poor level be 0.17% (95%CI: 0.002-0.005) (Table 2)

#### Table 2: Prevalence of attitude-levels of using the RPE

<table>
<thead>
<tr>
<th>Level of attitude</th>
<th>Number</th>
<th>Percent (%)</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>467</td>
<td>79.42</td>
<td>76.14-82.70</td>
</tr>
<tr>
<td>Medium</td>
<td>120</td>
<td>20.41</td>
<td>17.14-23.68</td>
</tr>
<tr>
<td>Poor</td>
<td>1</td>
<td>0.17</td>
<td>0.002-0.005</td>
</tr>
</tbody>
</table>

Mean (SD) = 48.75(05.76); Median (Min: Max) = 48(14:60)

The total 588 sugarcane factory workers, majority were behavior of usage of RPE are in good level 64.80% (95%CI: 60.92-68.67) then in medium level is 33.16% (95%CI: 29.35-36.98) and poor level is 2.04% (95%CI: 0.89-3.19) (Table 3)

#### Table 3: Prevalence of behavior-levels of using the RPE

<table>
<thead>
<tr>
<th>Level of behavior</th>
<th>Number</th>
<th>Percent (%)</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>381</td>
<td>64.80</td>
<td>60.92-68.67</td>
</tr>
<tr>
<td>Medium</td>
<td>195</td>
<td>33.16</td>
<td>29.35-36.98</td>
</tr>
<tr>
<td>Poor</td>
<td>12</td>
<td>2.04</td>
<td>0.89-3.19</td>
</tr>
</tbody>
</table>

Mean (SD) = 40.71(4.84); Median (Min: Max) = 41(20:48)
Factors associated with behavior of usage the RPE: Bivariate analysis.

Bivariate analysis on the association between each independent variable and good behavior usage RPE among sugarcane factory was performed presenting the crude odds ratio (OR) with 95% CI, and p-value. All factors that had p-value <0.25 were proceeded to multivariable analysis by using multiple logistic regression. (Table 4)

Table 4: Factors associated with behavior of usage the RPE: Bivariate analysis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Event</th>
<th>% of Event</th>
<th>Odds ratio</th>
<th>95%CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Good behaviors</td>
<td>381</td>
<td>64.8</td>
<td>N/A</td>
<td>60.92-68.67</td>
<td>N/A</td>
</tr>
<tr>
<td>1. Level of attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>121</td>
<td>57.02</td>
<td>1</td>
<td></td>
<td>0.047</td>
</tr>
<tr>
<td>Good</td>
<td>467</td>
<td>66.81</td>
<td>1.52</td>
<td>1.01 to 2.28</td>
<td></td>
</tr>
<tr>
<td>2. Age(years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;= 39</td>
<td>335</td>
<td>60.00</td>
<td>1</td>
<td></td>
<td>0.005</td>
</tr>
<tr>
<td>&gt;=40</td>
<td>253</td>
<td>71.15</td>
<td>1.64</td>
<td>1.16 to 2.33</td>
<td></td>
</tr>
<tr>
<td>3. Financial status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>386</td>
<td>62.44</td>
<td>1</td>
<td></td>
<td>0.096</td>
</tr>
<tr>
<td>Good</td>
<td>202</td>
<td>69.31</td>
<td>1.36</td>
<td>0.94 to 1.95</td>
<td></td>
</tr>
<tr>
<td>4. Department</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juice extraction machine</td>
<td>397</td>
<td>68.77</td>
<td>1</td>
<td></td>
<td>0.015</td>
</tr>
<tr>
<td>Steam-boilers</td>
<td>158</td>
<td>56.33</td>
<td>0.58</td>
<td>0.40 to 0.86</td>
<td></td>
</tr>
<tr>
<td>Bagasse yard</td>
<td>33</td>
<td>57.58</td>
<td>0.62</td>
<td>0.29 to 1.27</td>
<td></td>
</tr>
<tr>
<td>5. Getting information from safety officer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.020</td>
</tr>
<tr>
<td>No</td>
<td>130</td>
<td>56.15</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>458</td>
<td>67.25</td>
<td>1.60</td>
<td>1.08 to 2.39</td>
<td></td>
</tr>
<tr>
<td>6. Information board in the factories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.103</td>
</tr>
<tr>
<td>No</td>
<td>369</td>
<td>62.33</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>219</td>
<td>68.95</td>
<td>1.34</td>
<td>0.94 to 1.91</td>
<td></td>
</tr>
<tr>
<td>7. Use shirts to prevent dust once on working</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.009</td>
</tr>
<tr>
<td>No</td>
<td>456</td>
<td>62.06</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>132</td>
<td>74.24</td>
<td>1.76</td>
<td>1.14 to 2.72</td>
<td></td>
</tr>
<tr>
<td>8. Use loincloths to prevent dust once on working</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.008</td>
</tr>
<tr>
<td>No</td>
<td>573</td>
<td>64.05</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15</td>
<td>93.33</td>
<td>7.86</td>
<td>1.02 to 60.19</td>
<td></td>
</tr>
</tbody>
</table>
Factors associated with behaviors of usage RPE: Multiple logistic regression analysis

Multiple logistic regression analysis by Backward elimination indicated that sugarcane factory workers who have group of age over or equal 40 years old was 1.65 times of having good behavior using RPE when compared with those who aged less than 40 years old (AOR= 1.65, 95%CI: 1.14 to 2.38)

Those who have good financial status were much better 1.57 times of good behavior using RPE when compared with those having poor financial status (AOR= 1.57, 95%CI: 1.07 to 2.29)

Those who worked in the departments of steam-boilers and bagasse yard were 0.59 times and 0.66 times of having good behavior using RPE when compared with those who worked in department of juice extraction (AOR= 0.59, 95%CI: 0.40 to 0.83) and (AOR= 0.66, 95%CI: 0.31 to 1.40) respectively. (Table 5)

Table 5: Factors associated with behaviors of usage RPE: Multivariate analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Event</th>
<th>% of Event</th>
<th>Crude odds ratio</th>
<th>Adjusted odds ratio</th>
<th>95%CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.007</td>
</tr>
<tr>
<td>≤ 39</td>
<td>335</td>
<td>60.00</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥40</td>
<td>253</td>
<td>71.15</td>
<td>1.64</td>
<td>1.65</td>
<td>1.14 to 2.38</td>
<td></td>
</tr>
<tr>
<td>2. Financial status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.021</td>
</tr>
<tr>
<td>Poor</td>
<td>386</td>
<td>62.44</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>202</td>
<td>69.31</td>
<td>1.36</td>
<td>1.57</td>
<td>1.07 to 2.29</td>
<td></td>
</tr>
<tr>
<td>3. Department</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.017</td>
</tr>
<tr>
<td>Juice extraction machine</td>
<td>397</td>
<td>68.77</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam-boilers</td>
<td>158</td>
<td>56.33</td>
<td>0.58</td>
<td>0.59</td>
<td>0.40 to 0.83</td>
<td></td>
</tr>
<tr>
<td>Bagasse yard</td>
<td>33</td>
<td>57.58</td>
<td>0.62</td>
<td>0.66</td>
<td>0.31 to 1.40</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

This study revealed that the good behaviors usage of RPE among sugarcane factory workers were 64.8%. And the associated factors with good behavior of usage RPE among sugarcane factory workers were found 3 factors including: age, financial status and department of work.

The association between age and good behaviors usage of the RPE was consistent with study in Nepalese industrial workers which revealed that increasing of age of workers had associated with good behaviors usage of the RPE(1).

Financial status had associated with PPE(1) where the RPE was one of subset PPE. To the current study, monthly income of workers were about 10,146THB equal to US dollar about (320$), had received the information how to use the RPE from safety officer were 77.89% that encouraged them using cotton masks of 94.56%.

The department of working, we found that group of worker in steam-boilers department is more likely better behavior usage of RPE than department of Juice extraction 0.59 times. However, sampling group in bagasse yard, they wear the RPE much better than the steam-boilers department at 0.66 times. The reason of did not use RPE maybe from difficulty in breathing, pain in the ear, small size of the face(3).

Conclusion

Behavior usage of RPE can improve occupational health and safety at workplace among factory workers. Besides, it emphasizes them to practice appropriate behavior of health preventive in workplace. This research has been collected the data from only three departments; juice extraction machine, steam-boilers and bagasse
yard. Therefore, we suggest next research should collect the data to cover all work-functions in the factory because they also are risky to inhale the dust while working. The current study of cross-sectional design was first a snap of associated factors with outcome being evident. Then the next study will be conducted on evidence-based recommendations promoting to change behavior in the actual workplace situation.

Research Ethics approval for this study was obtained from the Khon Kaen University Ethics Committee for human Research (HE602331).

Conflict of Interest Statement: The authors declare that no conflict of interest.

Source of Funding: The Research and Training Center for Enhancing Quality of Life for Working Age People, Khon Kaen University Thailand.(Contract No.60/029)

References


The Impact of an Educational Curriculum Using Technical Learning and Ginseng Accompanied in Development of Response Speed and Learning the Front and Back Dropped for Badminton Players

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1University of Kerbala /The College of Physical Education and Sports Sciences/ Iraq

Abstract

The researchers noted through his presence in the field of badminton, that most players with ages of (13-15) years suffer from weakness in the response and reaction, and this affects the impact on the basic strikes of the badminton plane, because the process of identifying stimuli and awareness helps to create dynamic programs in the brain, making the response quick. This is where the research problem is concentrated. The aim of the research is to develop an educational curriculum using technical learning and ginseng in the development of response speed and learning the projected front and rear projection of the players of the plane. And to identify the impact of the educational method using technical learning and ginseng in the development of response speed and learn the strike of front and back dropped for badminton players.

The researchers used the experimental approach with the design of the two sets of pre-and post-test tests to suit the nature of the problem and achieve the research objectives. The study sample represented the entire research community and they are the players of the training center in the district of Mahaweel - Babil province for the season 2019 and the number of (6) players and ages (13-15) years and this means the researcher used the method of comprehensive inventory of all members of the community.

The most important conclusion is that the curriculum using technical learning and ginseng has a significant role in the development of response speed and the projected impact of the front and rear of the players of the badminton. The experimental group is superior to the post tests, which means that the educational curriculum using the technical learning and ginseng was active and effective.

Keywords: educational curriculum, technical learning, front and back dropped.

Introduction

Many of the educational methods used in learning mathematical skill varied proportions used with success in the skill and cognitive performance and emotional so experts and researchers sought to find methods of serving sporting events and skills all in line with the learner, the style technical is one of these modern methods in the learning process, which means the arrival of the learner to the point of workmanship and installation mechanism in the development of learning outcomes (skill, cognitive, emotional) and access to their degree and then move perfection to learn another skill.

The speed of the motor response is one of the motor abilities that have an important role in the technical performance of offensive and defensive skills and together with other factors is an important basis in resolving the situation, as the striker in the badminton must be characterized by shortened the time of his motor response to reach the badminton. And through the readings of researchers in many references and scientific research to improve or increase the capabilities of the athlete and the positive performance of referees and
players observed the use of medicinal plants in the field of sports and widely, for many reasons, including the absence of chemicals that may harm health, as well as non-food. As well as to avoid side effects caused by the use of chemical drugs.²

The majority of players aged (13) to (15) years suffer from weak response and reaction, which affects the basic plane crash, because the process of identifying stimuli and recognizing them Helps to create dynamic programs in the brain, making the response quick. Hence, the problem of research was determined. Therefore, the researchers decided to prepare a learning curriculum using technical learning, which aims at mastering the skill, controlling its kinetic pathway and using food supplement in developing the response speed and learning the projected front and rear projection of the players with the badminton.³

The variety of badminton tournaments (singles, doubles and mixed doubles) for men and women has made most countries adopt the principle of specialization in the game, because badminton skills are characterized by a high degree of accuracy and difficulty because of the high speed of the badminton and the multiple paths of movement at one point, which requires the player to recognize on all stimuli and kinetic variables in order to be able to respond in the least possible time, and hence the importance of research in the preparation of an educational curriculum using technical learning and the use of food supplement Ginseng in the development of response speed and learning the projected blow front and back of badminton players.

Research aims:

Preparation of a curriculum using technical learning and Ginseng in the development of response speed and learn the strick of front and back dropped for players of the badminton.

Research Methodology and Field Procedures:

Research Methodology:

The researchers used the experimental approach to design a single group with pre and post testing, in order to suit the nature of the problem and achieve the research objectives.

Search community and sample:

The study sample represented the entire research community and they are the players of the training center in the district of Mahaweel - Babil province for the season 2019 and the number of (6) players and ages (13-15) years and this means the researcher used the method of comprehensive inventory of all members of the community.

Search tools and devices:

1 - Integrated badminton courts type (Yonex) number (2)
2- Yonex badminton rackets (12)
3- Yonex badminton balls (10)
6 - Magic colored pens number (5) 7 - colored adhesive tapes number (10) Role
8 - Linen measuring tape 20 m length 9 - Chinese stopwatch number (2)
10 - Tests 11 - Questionnaire 12 - Data dump form
13 - Large rubber balls (4) 14 - Rubber ropes 5 - 15 - rope for jumping (5) 16 - A ground ladder made of linen length (10 m).

Technical tests and response speed:

Front and back dropped test:

Purpose of the test: measuring the skill of the front projection shot.

Required tools: feather rackets, feathers, striped playground with test design as shown in figure (1).

Description of performance: After the test is explained to the labs, each laboratory (5) will be given experimental attempts to warm up and then the player will stand at the specified location (X) and (5m) from
the net, he is holding his racket with a forward catch to receive the badminton sent to him from the opposite field ( ). Drop it in the top-rated area (3, 2, 1).

**Performance Calendar:** The player performs (12) attempts and calculates his best (10) attempts.

The degree is given according to the place of fall of the feather.

Badminton located on a line between two regions given the highest degree.

The highest points the player can get are (30) points.

![Diagram of badminton court](image)

**Figure (1). Explain the layout of the badminton court to test the front and back dropped**

**Nelson Test for Kinetic Response:**

**Purpose of the test:** Measurement of the ability to respond and move quickly and accurately according to the choice of stimulant

**Tools:** A flat area free of obstacles (20m), width (2m), stopwatch and tape measure.

**Procedures:** The layout of the test area with three lines between each line is 6.40 m and the length of the line is 1 m.

**Test Instructions:**

Each laboratory is given a number of attempts outside measurement on the same basic conditions in order to identify the testing procedures.

The referee must train on the start signal, so that he can give this signal by the arm and run the clock at the same time.

The referee before the test to the laboratory to withdraw the previous ten cards in a random way and recorded in the order of withdrawal in a special card and put it in one of his hands to guide in the sequence of signal trends and record time for each laboratory separate from the other and this is used to prevent the laboratory from expecting to try next.

The laboratory must not know that it is required to perform ten attempts distributed equally in both directions, but it is possible that the number of attempts to direction is greater than the other and that the order of performance of attempts is random and varies from laboratory to laboratory.

The test should begin with the referee giving the following signal: Prepare - once, in all attempts the time interval between (reset-start) should be between (0.5-2) seconds.

The laboratory should do some light exercise for the purpose of warm-up, preferably wearing light shoes and the test area must be free of any contraindications.

**Registration:**

The time of each attempt is calculated for the nearest second.

Laboratory degree is: average ten attempts.

**Pre Tests:**

The researchers applied the pretests on 2/2/2019 in the closed hall in the district of Mahaweel - Babil province at 10 am, where the technical tests, testing and response speed were conducted.

**Exercises used in research:**

The researchers designed an educational curriculum according to the method of technical learning by giving repetitions to the learner to achieve one skill to master the real and adjust the motor path and then move to the other skill, in addition to the dietary supplement was taken ginseng, where the doses of US ginseng were determined:

Effective doses of adults aged 25-35 years should be between 50-75 g and 2 to 8 g for a period of 8-12 weeks maximum. So half of this quantity has been adopted to match the sample search

Ginseng should be taken every 12 hours or twice a day.

It is recommended to take the American ginseng before eating to increase the speed of absorption of food and to benefit more.
The use of US ginseng more than 3 months because it leads to vitamin B6 deficiency in the body, leading to feelings of indigestion and depression.

The good product of American ginseng is that contains Ginsenoside by between 4 to 7 percent.

The main experiment was applied in 4-2, 5-3-2019, where the educational curriculum was implemented at two units per week and 90 minutes per unit.

Post tests:

The post-tests for the technical tests and the response speed were applied to the two groups on 7/3/2019 and in conditions similar to the pretests.

Table (1). Calculate the values of the mean, the standard deviation, and the calculated Wilcoxon values for the tests pre and post

<table>
<thead>
<tr>
<th>Tests</th>
<th>Units</th>
<th>Pretest</th>
<th></th>
<th></th>
<th>Posttest</th>
<th></th>
<th></th>
<th>Wilcoxon value</th>
<th>Level of significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strike front Dropped</td>
<td>Grade</td>
<td>17.1</td>
<td>1.32</td>
<td></td>
<td>28</td>
<td>1.43</td>
<td></td>
<td>2.216</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td>Strike back Dropped</td>
<td>Grade</td>
<td>18</td>
<td>1.31</td>
<td></td>
<td>21</td>
<td>1.70</td>
<td></td>
<td>2.112</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td>Motor speed response</td>
<td>Time</td>
<td>1.66</td>
<td>0.21</td>
<td></td>
<td>1.29</td>
<td>0.11</td>
<td></td>
<td>2.213</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

From the table (1) show that use of educational exercises and their suitability to the level of learners and to give appropriate repetitions with the type of exercise and the ability of the learner during the main section of the unit and stated that “the repetition of motor performance is a requirement that people need to reach a high level of learning locomotive”. There is also a clear impact on the educational method used to take into account the difficult skill segmentation and takes into account the individual differences in the learning process and the promotion of feedback.

This is characterized by the technique of education, “which is an educational plan that provides each student with the time needed to reach the level of ability as individuals learn at different rates “[8]. The researcher believes that the method of learning proficiency through attempts to master the successful performance of skills contributes to the educated sense of self-esteem and self-confidence and control their emotions when they identify and diagnose themselves negative and positive aspects, trying to correct them feedback, which increases the confidence and ability to achieve the achievement of the duty of motor.[9]

The use of the experimental group to the American ginseng, which led to this, as the American ginseng with the most important medicinal plants because it contains ginsocides, which in turn increase the focus and works to stimulate the individual physically and psychologically, especially contain the element (f11) Blood circulation. And gives the individual the ability to endurance and fatigue resistance US ginseng is a natural tonic that increases the stamina and helps increase energy levels, helps athletes use oxygen more effectively, regulates metabolism, and increases recovery.[10] The player needs to adapt and fast switch and control the badminton and what the opponent does and this depends on the speed
of the player because the speed of the shuttle is large and needs a quick response, the shorter the speed of the response speed of the motor player was able to act proper and timely especially the deception games performed by the opponent.

Conclusions

The curriculum using technical learning and Ginseng has a significant role and effective in the development of response speed and the front, back dropped impact of the front and rear of the badminton players.

The experimental group is superior in the tests of the dimension, which means that the educational curriculum using technical learning and Ginseng was active and effective.

Ethical Clearance- Taken from University of Kerbala committee

Source of Funding- Self

Conflict of Interest - None

References


The Relationship between Overlapping Wave Strategy and Healthcare Performance Improvement

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Abstract

Healthcare performance is important factors in all health systems worldwide. Many studies tried to assess the factors that improving healthcare performance. Hence, this paper aimed to explore the relationship between overlapping wave strategy and performance improvement in Iraqi healthcare institutions. According to the literatures conceptual framework were proposed and tested using structural equation modeling and regression, the results confirmed that overlapping wave strategy and its dimensions positively affected healthcare performance.

Keywords: Iraqi Healthcare, Healthcare performance, Strategic Navigation, Genius Leadership, Future Managing, Knowledge Leadership.

Introduction

Iraq has gone through decades of war and substantial sanctions from the United Nations. For example, as a result of the Gulf War in the 1990s and a decade of sanctions were among the side effects on hospitals¹. Before these conditions, Iraq had a very high standard of healthcare when compared to other countries in the Arab region. Healthcare in the country was free by then, administered centrally through the ministry of health and well equipped with necessary equipment and appropriate number of personnel². Basic medicines have often been unavailable in various hospitals in the country, As a result, the mortality rate, more also the infant mortality rate has more than doubled up³. Unless some drastic measures are undertaken to improve the situation in the country, Iraqi’s health care sector is likely to worsen even further. More focus should be placed on how to provide essential facilities like basic sanitation, essential drugs and immunization services⁴.

Accordingly, Iraqi health institutions need to employ successful strategies to improve performance. in this area we find many success stories about the concept of overlapping wave strategy, and they have proved positive results in many areas. The philosophy of research was initiated by the ideas of Siegler (1996)⁴ which presented overlapping wave strategy, and have proved positive results in many areas.

Accordingly, this paper aims to explore the relation between overlapping wave strategy and healthcare performance improvement.

Literature Review

Overlapping Waves Strategy

The theory of overlapping wave strategy is a modern perspective. Here, the strategists use a number of strategies to do their work, so many different strategies will appear to address all the old and new information and data, and there will be a simultaneous process in strategy development⁵. Showing the process of competing in individual ideas to reach a more useful idea⁶. Thus, Siegler presents the theory of overlapping wave strategy based on three assumptions:

1. At any time, personnel or employees think in a variety of ways about most administrative problems.

2. These different ways of thinking compete with each other.

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3. The development of strategic knowledge results in gradual changes in the frequency of these ways of thinking.

Figure 1 shows the diagram of these assumptions, which indicates that any vertical segment in the figure indicates that multiple methods are used simultaneously. The use of the curve for any strategy indicates that strategies will continue to be used for long periods of time. Looking horizontally across the figure indicates that the relative frequencies of all strategies gradually change over time, with sometimes new strategies being added and sometimes old strategies ceasing to be used. Thus, the diagram focuses on several key issues: the set of approaches used by individuals in a particular situation, the factors that influence their choices among these methods, the mechanisms that change the use frequencies of existing approaches, and the mechanisms that lead to the discovery of new approaches.

![Figure 1: Overlapping waves strategy](image)

**Luxury leadership**

Luxury leadership is a leadership style based on creative knowledge. This type of leadership requires organizations to be prepared to change by starting shifts from the current reality and encouraging change. Perfectionist customers may see that there is additional value. Luxury leadership is a management, strategy and performance that teaches everyone how to develop, experience products and services, and long-term loyalty.

**Strategic navigation in leadership**

Navigation leadership is the case when leaders influence their followers to increase their moral standards, views, beliefs, alliances, and motivations. Inspirational leadership involves the link between the leader and followers. It is inspirational, giving subordinates the ability to test current assumptions seriously and encourage them to think across broader dimensions. Thus, they have the ability to influence their followers behavior, resulting in positive outcomes.

**Genius leadership**

Intelligence and genius are closely related to each other and the Genius leadership is determined by the energy emitted from the inner side of individuals and their own abilities. Genius is a very important tool for leadership where leaders can acquire and use knowledge to solve problems within the organization. Genius leadership is a recognition of the best principle of trust to be able to stand in the place of personal power and intelligence.

**Future Managing**

Researchers noted that management thinking has moved to an understanding of human actions as a sense-making process. The future of an organization is determined by sense-making relationships of its employees rather than the decisions of a few influential individuals. Future managing is described as the practice of managing goals and performance targets of the organization. Management of any organization requires great agility, capacity to rapidly and positively respond to change. Future managing explores innovative talent management, emerging leadership concepts and managerial response and techniques for addressing future organization needs.

**Knowledge leadership**

Knowledge is an important and necessary tool for leadership. It enables them to identify creative solutions and make the right decisions. Knowledge leadership is defined as the process of supporting individuals in the learning process required to achieve group goals or organizational needs. The leadership of any successful institution lies in the knowledge that creates the demand for individuals and teams to exchange and transfer knowledge within the organization.

**Healthcare Performance Improvement**

Health care includes all services performed by the medical team to the community. Healthcare Performance Improvement provides proven methods for building and sustaining a culture of safety. The quality
of the health service is defined as a set of procedures to ensure the achievement of high levels of quality health service provided to customers. It represents the range of characteristics that the health service has and the way in which they provide and which affect the satisfaction of the needs of customers. The World Health Organization pointed out that the quality of the health service must be of the same standards and trends in a safe and cost-appropriate and contribute to the impact of positive situations that contributes to providing opportunities to improve care and solve problems. Which represents a scientific method to provide and improve the health service.

**Material and Method**

**Instrument**

The current survey is an applied research and in terms of data collection, it is considered a survey. The population of this study are physicians. because this group of people directly related to the study subject; therefore, their views can be relied upon. Second, the issue of changing healthcare quality seems to need a valid scientific opinion. So the researchers decided to select a group of physicians as a statistical population, in the case of search variables, in order to mention their ideas and opinions. The sampling method in this study is random. The questionnaires used in this study were distributed from a total of 130 and 102 questionnaires were considered acceptable.

**Research Model and Hypotheses**

The research work was qualitative and in its development a linear analytical sequence was followed. In addition, it has relied on the constructivist paradigm and two research methods: one for the construction of the theoretical model and another for empirical validation structural equation modeling. Due to the importance of both methods. The study methodology consist of several stages like literatures, data collection structural equation modeling and regression analysis, the literature and related studies help to discover the conceptual theory that related to overlapping wave strategy (OWS) and healthcare performance improvement (HPI) and using the methods of analysis. And the conceptual model consists of the OWS as independent variable and HPI as dependent variable as it shown in figure 2. Hence, the following hypothesis is proposed:

- **H1**: Luxury leadership positively affects HPI.
- **H2**: Strategic navigation positively affects HPI.
- **H3**: Genius leadership positively affects HPI.
- **H4**: Future managing positively affects HPI.
- **H5**: Knowledge leadership positively affects HPI.

![Figure 2: Research Conceptual Model](image)

**Measuring Variables**

The study’s questionnaires were adopted from relevant literature review. Accordingly, 20 questions in the field of establishment rate of overlapping wave strategy (OWS) with five dimensions (luxury leadership (LL), strategic navigation in leadership (SN), genius leadership (GE), future managing (FM), knowledge leadership (KL)) were offered that has been used in the present research and 8 questions about the healthcare performance improvement (HPI).

Questions asked in the questionnaire, by a number of professors who have conducted researches in this area were reviewed and were approved by them. Therefore, it can be concluded that face and content validity of questionnaire is acceptable. The reliability of the questionnaire was assessed by Cronbach’s alpha and it was acceptable with an overall reliability coefficient for 28 questions of the questionnaire of 0.967 , for 20 questions of overlapping wave strategy was 0.978 and for the 8 questions of Healthcare Performance of 0.963

**Characteristics of Statistical Sample**

In order to provide clear picture from collected statistical samples, three demographic variables were
included in the questionnaire. Descriptive statistics for these variables are shown in Table 1. It is clear that the majority of sample is male (59.8%) and (40.2%) female, the age refer to (46.08%) less than 30 years, (28.43%) between (30-40) and (14.71%) between (41-50) and the other (10.78%) are more than 50 years, and regarding to the education it been the majority of respondents are BSC (60.78%), the (20.59%) MSC and (18.63%) PhD.

Table 1. Characteristics of the studied group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Class</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>61</td>
<td>59.80%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>41</td>
<td>40.20%</td>
</tr>
<tr>
<td>Age</td>
<td>&lt;30</td>
<td>47</td>
<td>46.08%</td>
</tr>
<tr>
<td></td>
<td>30-40</td>
<td>29</td>
<td>28.43%</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>15</td>
<td>14.71%</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>11</td>
<td>10.78%</td>
</tr>
<tr>
<td>Education</td>
<td>BSC</td>
<td>62</td>
<td>60.78%</td>
</tr>
<tr>
<td></td>
<td>MSC</td>
<td>21</td>
<td>20.59%</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>19</td>
<td>18.63%</td>
</tr>
</tbody>
</table>

Table 2. Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>B0</th>
<th>B1</th>
<th>r</th>
<th>R2</th>
<th>T</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>LL</td>
<td>0.014</td>
<td>0.908</td>
<td>0.796</td>
<td>0.634</td>
<td>13.151</td>
<td>172.952</td>
<td>0.000</td>
</tr>
<tr>
<td>SN</td>
<td>0.187</td>
<td>0.894</td>
<td>0.859</td>
<td>0.738</td>
<td>16.800</td>
<td>282.451</td>
<td>0.000</td>
</tr>
<tr>
<td>GE</td>
<td>0.196</td>
<td>0.872</td>
<td>0.837</td>
<td>0.701</td>
<td>15.295</td>
<td>233.147</td>
<td>0.000</td>
</tr>
<tr>
<td>FM</td>
<td>0.147</td>
<td>0.828</td>
<td>0.726</td>
<td>0.527</td>
<td>10.560</td>
<td>111.514</td>
<td>0.000</td>
</tr>
<tr>
<td>KL</td>
<td>0.144</td>
<td>0.931</td>
<td>0.869</td>
<td>0.755</td>
<td>17.553</td>
<td>308.142</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Thus, after conducting this study analysis, strength relationship between dependent variable and independent variable can be obtained by the structural modeling to get the multiple relation. Table 3 shows the results of the estimates of the multiple relationships between the five factors of OWS and their impact on HPI. Estimates of multiple linear regression were obtained by SEM. The results showed that there was no statistically significant effect of the factor (LL) because the degree of significance was not within the acceptable range (P>0.05), and there was a significant effect of factor (SN). A regression coefficient (0.40) (P<0.05) was recorded. As for factor (GE), it was found that there was a statistically significant effect. A regression coefficient (0.27)(P<0.05). The results also indicate that there is a significant effect for the factor (FM). A regression coefficient

Results

In the study, the relationship between variables was examined with the use of person’s correlation coefficient. Table 2 results indicate a positive relationship between factors of OWS and HPI. Where the relationship between LL and HPI (r=0.796, p<0.001). At the same time, the SN and HPI are positively related (r=0.859, p<0.001). Also the relationship between GE and HPI (r=0.837, p<0.001). At the same time, the FM and HPI are positively related (r=0.726, p<0.001). Finally the relationship between KL and HPI (r=0.726, p<0.001).

Regarding to the regression analysis table 2 shows how HPI affected by factors of OWS, LL has a positive effect on HPI (B0=0.014,B1=0.908, R2=0.634, p<0.001), The hypothesis 1 outcomes are thus supported. And the HPI is affected positively and significantly to SN (B0=0.187,B1=0.894, R2=0.738, p<0.001), this result support hypothesis 2. Moreover, HPI is positively and significantly affected by GE (B0=0.196,B1=0.872, R2=0.701, p<0.001),The hypothesis 3 outcomes are thus supported. HPI is positively and significantly affected by FM (B0=0.147,B1=0.828, R2=0.527, p<0.001),this result support hypothesis 4. Finally HPI is positively and significantly affected by KL (B0=0.144,B1=0.931, R2=0.755, p<0.001),this result support hypothesis 5.
(0.13),(P< 0.05). And significant effect for the factor (KL) with regression coefficient of (0.72),(P< 0.05).

### Table 3. Multiple Regression Results

<table>
<thead>
<tr>
<th>Path</th>
<th>Value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>LL…..&gt; HPI</td>
<td>0.05</td>
<td>0.063</td>
</tr>
<tr>
<td>SN…..&gt; HPI</td>
<td>0.40</td>
<td>0.000</td>
</tr>
<tr>
<td>GE…..&gt; HPI</td>
<td>0.27</td>
<td>0.000</td>
</tr>
<tr>
<td>FM…..&gt; HPI</td>
<td>0.13</td>
<td>0.021</td>
</tr>
<tr>
<td>KL…..&gt; HPI</td>
<td>0.72</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Figure 3: SEM For the Relationship Between Variables**

**Discussion**

Organizations select and implement success strategies in favor of improve performance and the achievement of competitive advantages. The justification for implementation, maintenance and improvement of the strategy represents a challenge for the professional of the quality of performance. The healthcare organizations can adopt strategies such as overlapping wave strategy to improve its performance.

The present investigation gives an account of the impact of the overlapping wave strategy with dimensions of (Luxury leadership, strategic navigation in leadership, genius leadership, future managing, knowledge leadership) to improve performance in Iraqi healthcare organizations. The impact of luxury leadership has been positively reflected in healthcare performance. This is in line with studies that proved the positive relationship among leadership commitment, organizational performance. Strategic navigation in leadership has proven its positive impact in performance, strategic navigation improve the performance. Also the study proved the effect of genius leadership in improving the performance. This result is in line with literatures which refer to the genius as an exceptional ability in thinking and creative work that produces unexpected results, which would greatly improve performance. As for future managing it has positive impact on performance, the studies indicated future management and strategic planning will improve performance well, because it gives a clear picture of the future and how to manage it.

**Conclusion**

The knowledge leadership important for performance, where knowledge contributes to giving the leader the right picture and help him make the right decisions at the right times. Accordingly, healthcare organizations have to have overlapping wave strategy in order to improve their performance.

**Conflict of Interest**: Authors declared: None.

**Source of Funding**: Self-Funding.

**Ethical Permission**: Taken from ethical committee of institution.

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E-learning Readiness from Perspectives of Medical Students: A Case Study of University of Fallujah

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Abstract

Until this time, the classical face-to-face learning with minimal e-communication is the method used in the medical school of the University of Fallujah in Iraq. The main goal of this study is to explore medical student’s readiness for E-Learning in the University of Fallujah in Iraq and to build a model for assessing its predictors.

This study was conducted using descriptive statistics, Spearman’s correlation, multiple regressions, and ANOVA. The results obtained indicate that students are not ready to move to E-Learning, as indicated by their technological, cultural, attitude and content readiness. The study concluded that Information and communications technology (ICT) is not sufficient to support the use of E-Learning.

Keywords: E-Learning, Readiness, University of Fallujah, Medical Students.

Introduction

The traditional learning was with face to face interaction between teachers and learners in classrooms. However, the spread of the Internet and electronic devices over the years in the world causes a great change in the way learning at different levels of educational institutions is carried out. At first, this change started in the developed countries, but has broadened as expected, to cover the developing regions such as Arabian countries, where Iraq belongs. One of the most advantages of E-Learning is expanding learning, which allows different paces to learn however, Zhang et al. mentioned that there are some disadvantages like “being uncomfortable for some users”. Teaching medical education and health has been proved to be more effective using E-Learning in the developed countries. At first, it was widely believed that E-Learning was the same as distant education where learning was only web-based; As time goes by this concept expanded. E-Learning is defined as a means of combining all arrangements for E-Learning, or one can say E-Learning is a means of learning and teaching using ICTs, inside the classroom and outside it.

Medical training in Iraq, lasts six years from 1st year to 6th year. At present, it is necessary that educational institutions broaden and develop their learning strategies to include E-Learning. This has been observed in medical education in developing countries. In order to achieve this on the ground, E-Learning readiness assessment is important because one of the basic elements in designing E-Learning programs is self-directed learning which signals that the availability of enabling E-Learning ambience and readiness of participants in E-Learning are both essential to get successful E-Learning programs. In the studied university, teaching medical students are mostly done by the traditional classroom method and by physical attendance in clinics with very little e-communication. Hence, this study was to decide the E-Learning readiness, E-Learning readiness predictors and to set a model for medical students E-Learning readiness in the studied university.

Background

E-Learning

According to the Organization for Economic Co-operation and Development (OECD, 2005) E-learning is “the use of information and communications technology (ICT) to foster and/or support learning in university education”. Rosenberg defined E-Learning as “the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance”. Negash & Wilcox classified E-Learning into six types:
1. E-Learning with physical presence or face-to-face and without e-communication
2. E-Learning without e-communication and without presence
3. (Asynchronous) E-Learning with e-communication and without presence
4. (Synchronous) E-Learning with e-communication and with virtual presence
5. (Blended/hybrid-asynchronous is a mix of asynchronous E-Learning and face-to-face E-Learning).
6. (Blended/hybrid-synchronous) which is E-Learning with e-communication and with presence.

**E-Learning Readiness**

E-Learning readiness was defined by Borotis & Poulymenakou as “the mental or physical preparedness of an organization for some E-Learning experience or action”[8]. The readiness assessment enables institutions to design systems and appropriate measures to succeed. Readiness assessment of E-Learning users is becoming vital in developing countries where e-Maturity is low, because it is gaining popularity.

The assessment should consider the factors that are pivotal, and from reviewing the existing research, it could be seen that there are some common factors e.g. technical readiness, content readiness, financial readiness and human resources readiness. Furthermore, there are important factors in E-Learning which are demographic factors like education level, gender and, age[11]. Furthermore, it is necessary to bear in mind that readiness is not a one-time phenomenon but it must be a persistent process of assessment.

**Conceptual Model For E-Learning Readiness Assessment**

Scholars have proposed different notions to assess E-Learning readiness. A model with 3 broad component was proposed by Psycharis[12] which were education, resources and environment in addition to 2-3 sub-components for each of the main components. A 4-broad component model was proposed by Oketch, Njihia, & Wausi[13] for developing countries with these components: demographic factors, content readiness, culture readiness, and technological readiness.

Nevertheless, Rogers[14] indicated that every organization can be effective in spreading innovation in its system and has its own standards. According to this perspective, it is clear that these models may not work for institutions of other countries. Recently, it was shown that higher education organizations in developing countries have made advancement in using ICT. This leads to the fact that most of the strategies and implementation conditions that are widely used in developed world have not yet been adopted.

According to the review of E-Learning readiness models, the model shown in Figure 1. was developed to direct the study. Taking in consideration that different communities differ in their response and acceptance of learning initiatives, that’s why, the conceptual scope of this study has been modified from reviewing similar literature conducted in other developing countries[13,15]. Concentration, in this study will be on these five parameters that have been reported to affect E-Learning readiness which are; psychological readiness, technological readiness[11,16], content readiness[8,12,16], culture readiness[8,15] and demographics [11]. Technical readiness has two sub-factors which will be considered while the assessment period. The model shown in Figure 1. is a result of Integrating these ideas.

![Figure 1. E-Learning Readiness Assessment Model](image)

**Technological Readiness**

According to Rogers[14], one of the parameters that can be used effectively “to adapt a technological innovation in an organization is technology”. It is very hard, if not impossible to use any E-Learning without appropriate equipment and easy access[17]. Using the E-Learning system, requires that users to posses technical skills. In this study, the technological readiness has two sub-factors; technical skills, and access to resources. They will be used to assess the availability of
computers and internet to the students and the students
ability to use them.

**Culture Readiness**

If institutions are willing to have a successful
E-Learning, they should be environmentally and
culturally prepared\(^{[18]}\). Therefore, this factor will
examine the students perception in terms of two sides;
perceived ease of use and perceived usefulness.

Ease of use, is essential for predicting and explaining
actual aim and the way of usage, while perceived
usefulness determine how an individual sees that using a
particular system could influence performance of job\(^ {19}\).

**Content Readiness**

The driving engine for any system is content. For
education, content readiness measurement is used to
determine E-Learning readiness. The model developed
in this study will examine the availability of E-Learning
content to the students and their satisfaction with the
content.

For E-Learning readiness, training is necessary
and it should be accounted in the implementation of
E-Learning\(^{[20]}\). Therefore, the model will assess if
the development of E-Learning materials need more
training.

**E-learning**

The demographic factors such as, gender, age
and the respondents level of education\(^{[11]}\) are collected
in this parameter. They handle all human resources
characteristics of an institution and individuals who have
a higher education level and are expected to adopt an
innovation more than others\(^{[14]}\). Therefore this parameter
will help define the effect of demographic factors on the
e-Learning readiness.

**Psychological readiness**

Psychological readiness reflects an individual’s
state of mind in terms of being ready for E-Learning.
A student’s mental preparedness is among the most
important factors that could affect the success of
E-Learning. This type of readiness is regarded as being
among the most significant aspects that could affect the
implementation process.

**Research Design and Method**

This study is a cross-sectional descriptive study of
medical students in university of Fallujah from second
to sixth year. The study excluded students in first year
because they have not started school at the time of data
collection.

Krejcie & Morgan table\(^{[21]}\) was used to determine the
sample size and 123 students were sampled. Participants
were stratified firstly according to study level and then
by proportionate sampling. For each level the proportion
of students was selected by simple random sampling.

A semi-structured self-administered questionnaire
was used in the study. It was an adaptation developed
by the researchers from the E-Learning readiness
model suggested by\(^{[13]}\) and other literature\(^{[8,15]}\). The
dependant variable was personal E-Learning readiness
while attitude toward E-Learning (psychological
readiness), technological readiness, culture readiness,
content readiness, and demographic variables were the
independent variables.

The mean value of the level of readiness was
considered in this study as 3.4 as was suggested by
Aydain & Tasci\(^{[11]}\) and has been adopted by Oketch et al.\(^{[13]}\). Analysis was done using SPSS version 19.

ANOVA and Spearman’s correlation tests were
conducted to determine association. In order to specify
the predictors of E-Learning readiness one step multiple
regression was applied, and an assessment model of
E-Learning was developed from the multiple regressions
result.

**Results**

A total of 110 questionnaires were returned which
gives a response rate of 89% which was quiet enough
for analysis. The value of Cronbach’s alpha was 0.913.
Table 1. Demographic variables of respondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>48.2</td>
</tr>
<tr>
<td>Female</td>
<td>57</td>
<td>51.8</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>36</td>
<td>32.7</td>
</tr>
<tr>
<td>21-24</td>
<td>74</td>
<td>67.3</td>
</tr>
<tr>
<td>25 and above</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Age at first computer use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 10 years</td>
<td>27</td>
<td>24.5</td>
</tr>
<tr>
<td>10-16 years</td>
<td>56</td>
<td>50.9</td>
</tr>
<tr>
<td>Above 16 years</td>
<td>27</td>
<td>24.5</td>
</tr>
<tr>
<td>Level of study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd stage</td>
<td>36</td>
<td>32.7</td>
</tr>
<tr>
<td>3rd stage</td>
<td>24</td>
<td>21.8</td>
</tr>
<tr>
<td>4th stage</td>
<td>15</td>
<td>13.6</td>
</tr>
<tr>
<td>5th stage</td>
<td>25</td>
<td>22.7</td>
</tr>
<tr>
<td>6th stage</td>
<td>10</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Table 2. Association between demographic variables and E-learning readiness

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F</th>
<th>Sig.</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd stage</td>
<td>36</td>
<td>3.2937</td>
<td>.53881</td>
<td>F=1.876</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>3rd stage</td>
<td>24</td>
<td>3.3214</td>
<td>.61805</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th stage</td>
<td>15</td>
<td>3.1143</td>
<td>.81923</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th stage</td>
<td>25</td>
<td>3.5886</td>
<td>.44858</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th stage</td>
<td>10</td>
<td>3.0714</td>
<td>1.05032</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>3.3221</td>
<td>.65091</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age at first computer use</strong></td>
<td></td>
<td></td>
<td></td>
<td>F=.929</td>
<td>0.398</td>
<td></td>
</tr>
<tr>
<td>less than 10 years</td>
<td>27</td>
<td>3.1746</td>
<td>.70470</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-16</td>
<td>56</td>
<td>3.3776</td>
<td>.63153</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 or more</td>
<td>27</td>
<td>3.3545</td>
<td>.63687</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>3.3221</td>
<td>.65091</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td>F=2.212</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>18-20</td>
<td>36</td>
<td>3.1905</td>
<td>.61374</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-24</td>
<td>74</td>
<td>3.3861</td>
<td>.66281</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>3.3221</td>
<td>.65091</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td>F=0.021</td>
<td>0.885</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>3.3127</td>
<td>.63891</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>57</td>
<td>3.3308</td>
<td>.66742</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>3.3221</td>
<td>.65091</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total-Attitude**  | .001 | 0.304**   |
**Total-Attitude**  | .000 | 0.399**   |
**Total-Attitude**  | .000 | 0.636**   |
**Total-Attitude**  | .000 | 0.608**   |

**Correlation is significant at the 0.01 level (2-tailed).**
Table 3. Predictors of E-learning readiness among the medical students

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>t</th>
<th>P(Sig.)</th>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>.347</td>
<td>1.166</td>
<td>.24</td>
<td>R=.719</td>
</tr>
<tr>
<td>TotalAttitude</td>
<td>.191</td>
<td>2.499</td>
<td>.014</td>
<td>Adj. R²=.499</td>
</tr>
<tr>
<td>TotalContent</td>
<td>.125</td>
<td>1.570</td>
<td>.119</td>
<td>R²=.517</td>
</tr>
<tr>
<td>TotalCulture</td>
<td>.339</td>
<td>3.806</td>
<td>.000</td>
<td>F=28.141</td>
</tr>
<tr>
<td>TotalTech</td>
<td>.249</td>
<td>2.454</td>
<td>.016</td>
<td>P=0.000</td>
</tr>
</tbody>
</table>

The results in Table 1 show that most of the participants were aged 21-24 years. Mean±(SD) age at first use of a computer was 12.75(±3.91) years with a range of 4-20 years.

The descriptive statistics indicate that total mean of attitude toward E-Learning was lower than the mean of expected readiness level, and that the total mean of content readiness was lower than the mean of expected readiness level whereas the required basic ICT skills for E-Learning mean was lower than the mean of expected readiness level.

Also it was shown that the overall technological readiness mean was lower than the mean of expected readiness level. Furthermore, the results show that the university does not have enough professional staff for E-Learning trainings (M=3.18).

The results in Table 2 show that demographic variables are not significantly associated with E-Learning readiness. Students in 6th year were significantly less ready than students in other levels for E-learning. Also the results in Table 2 show that the correlations ranged from 0.304 (psychological readiness) to 0.638 (culture readiness).

In the multiple regression analysis Table 3, attitude toward E-Learning, technological readiness and culture readiness, are statistically significantly predicted E-Learning readiness P<0.05 except content readiness. F(4,105)=28.141 and it is higher than its tabular value (F(4,105)tab=2.46 for α=.05), P=0.000, R²=0.517. On the other hand all demographic variables, did not statistically significantly added to the prediction. Hence, the model explains only 51.7% of readiness in this population.

Discussion

The descriptive analysis showed that the level of E-Learning readiness recorded in this work among students in a sixth stage of study was low (M=3.0714±1.050), this clashes with the proposition by Rogers[14] that higher educational levels has more influence on E-Learning readiness. Chapnic have got the same findings[16], the explanation for this might be that at sixth stage of study in medical school, students are preoccupied with clinical training than the traditional classroom approach.

The model developed in this study explained 51.7% of E-Learning readiness of the students which means that there are other parameters that affect E-Learning readiness among these medical students that were not taken into consideration in the study.

Conclusions

The medical students in this environment are not ready for E-Learning. Not ready yet to step forward beyond the traditional face-to-face method, however they believe that E-Learning is more powerful and can enhance the quality of their learning. They do not have basic ICT skills. They need further training on E-Learning content because it is necessary to attract users. They believe that their university does not have enough professionals to train students for E-Learning, nor sufficient IT infrastructure.

Indicators of E-Learning readiness in this study are attitude, technological readiness, culture readiness, and content readiness.

Recommendation

If the university is to implement E-Learning, it should condense training sessions for both faculty and student, in order to improve ability for E-Learning content. Access to ICT resources for medical students should be improved, while medical curriculum reviews should comprise, using interactions of E-Learning to enhance content and culture and enhance learning. Additional studies should include qualitative methodology for devising other factors that may affect E-Learning readiness in this community. Blended learning which describes, according to Rogers[14], “learning activities that involve a systematic combination of co-present (face-to-face) interactions and technologically mediated
interactions between students, teachers and learning resources”, is advised to be applied as a first step before turning totally to E-Learning.

**Limitations**

This study was applied on medical students in just one university in Iraq and hence, the findings may not be generalized to all Iraqi medical students.

**Ethical Clearance:** Was taken from the Scientific Committee in College of Medicine University of Fallujah.

**Source of Funding:** Nil

**Conflict of Interest:** Nil

**References**


Study of Parathyroid Hormone, Calcium and Phosphorus in Patients with Type 2 Diabetes Mellitus and Non-Diabetic Control in Salahaddin General Hospital

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Abstract

Background: Diabetes Mellitus is a metabolic disorder characterized by the presence of chronic hyperglycemia accompanied by greater or lesser impairment in the metabolism of carbohydrates, lipids and proteins. Both primary and secondary hyperparathyroidism are involved in abnormal glucose metabolism. Diabetic patients frequently develop electrolyte disorders and phosphorus is included.

Aim of the study: To measure serum parathyroid hormone, calcium and phosphorus in patients with type 2 diabetes mellitus and compare them with non-diabetic control, and to see if there is any relationship with HbA1c and duration of diabetes mellitus in diabetic group.

Patients and Method: This study is a descriptive case control study conducted in Consultancy Clinics of Salahaldin General hospital in Tikrit city. The duration of study was through the period from 1st of January, 2018 to 28th September, 2018. The study group enrolled (95) patients with type 2 diabetes mellitus and the control group enrolled (95) apparently healthy volunteers. Data collected from study and control groups including blood samples to measure HbA1c, S. PTH, S. calcium and S. phosphorus.

Results: the study and control groups was comparable in regard to gender, age and BMI without significant difference. The mean of HbA1c (8.18%), S. phosphorus (3.83 mg/dl) and S. PTH (49.08 pg/ml) in diabetic group was significantly more than that in control group (4.45%, 3.53 mg/dl, and 42.58 pg/ml respectively). While mean of S. calcium (7.97 mg/dl) in diabetic group was significantly less than that in control group (9.19 mg/dl). There were no significant difference in serum level of S.PTH, S. phosphorus and S. calcium in relation to duration of DM or the control of DM represented by HbA1c level in diabetic group. There was significant negative association between S. calcium and S. phosphorus in diabetic group. While there was weak negative association of PTH (but not significant) with HbA1c and weak positive association with duration of DM, while there was no significant association between serum phosphorus and calcium with HbA1c and duration of diabetes mellitus.

Conclusion: Diabetic group had significant higher level of serum PTH and phosphorus and significant lower level of serum calcium in comparison to non-diabetic group. In diabetic group, there was significant negative association between serum phosphorus and serum calcium, weak positive association between serum PTH and duration of diabetes mellitus and weak negative association between serum PTH and HbA1c.

Keywords: Type 2 diabetes mellitus (T2DM), parathyroid hormone (PTH), S. calcium, S. phosphorus.

Introduction

Diabetes Mellitus (DM) is a metabolic disorder characterized by the presence of chronic hyperglycemia accompanied by greater or lesser impairment in the
metabolism of carbohydrates, lipids and proteins\textsuperscript{1}. The origin and etiology of DM can vary greatly but always include defects in either insulin secretion or response or in both at some point in the course of disease. Mostly patients with diabetes mellitus have either type 1 diabetes (which is immune-mediated or idiopathic) or Type 2 DM (formerly known as non-insulin dependent DM) is the most common form of DM characterized by hyperglycemia, insulin resistance, and relative insulin deficiency\textsuperscript{2}. Type 2 DM affect more than 400 million people all over the world and it is expected to affect more than 640 million people in 2040\textsuperscript{3}. Parathyroid hormone (PTH) is a polypeptide containing 84 amino acid\textsuperscript{4} and it is maintaining the serum calcium in its narrow normal range\textsuperscript{5}. Both primary and secondary hyperparathyroidism are involved in abnormal glucose metabolism\textsuperscript{6}. Insulin secretion is a calcium dependent process. Calcium is important for insulin mediated intracellular processes in insulin responsive tissues such as adipose tissue and skeletal muscle with a very narrow range necessary for optimal insulin action. Further calcium is necessary for insulin receptor phosphorylation and proper signal transduction\textsuperscript{7}. Patients with resistance to 1, 25-OHD were found to have abnormal insulin secretion only if they were hypocalcaemia\textsuperscript{8}. Diabetic patients frequently develop electrolyte disorders and phosphorus is included\textsuperscript{9}.

**Aim of the Study**

Measure serum parathyroid hormone, calcium and phosphorus in patients with diabetes patients and compare them with non-diabetes, and to see if there is any relationship with HbA1c and duration of diabetes mellitus in diabetic group.

**Patients and methods**

**Patients:**

**Design, Settings & Sampling:**

This study is a descriptive case control study conducted in Consultancy Clinics of Salahaldin General hospital in Tikrit city. The duration of study was through the period from 1\textsuperscript{st} of January, 2018 to 28\textsuperscript{th} September, 2018. All type 2 diabetic patients presented to Consultancy Clinics of Salahaldin General hospital were the study population.

**Inclusion criteria:**

1. Adults (age ≥27 years).
2. Type 2 diabetes.

**Exclusion criteria:**

1. Type 1 diabetes mellitus
2. Type 2 diabetic patients on insulin therapy.
4. Stroke patients.
5. Thyroid and parathyroid dysfunction.
6. Chronic kidney diseases.
7. Patients refused participation in the study.

A convenient sample 100 type 2 diabetic patients were selected after eligibility to inclusion and exclusion criteria( 5 patients were excluded because of hemolysis of blood sample), age range was (27-80 years). A convenient sample of 100 apparently healthy controls was selected from volunteered relatives of patients presented to Consultancy Clinic of Salahaldin General hospital ( 5 patients were excluded due to hemolysis of blood sample), age range was (40-60 years).

**Methods:**

**Data collection:**

The data collection was carried out for each studied patient in a questionnaire sheet. The information was taken mostly from patients directly.

**Assessment of patients:**

The body weight and height of the patients and controls were measured using Seca scale instrument; then body mass index was calculated according to equation:

\[
\text{BMI}=\frac{\text{weight}}{\text{(square of height in meters)}}
\]

A sample of 5 ml of venous blood was collected by non-tourniquet method from diabetics and controls, and then 1 ml of blood was taken for EDTA tube for HbA1c. Four ml of blood was centrifuged for 10 minutes and serum used for measurement of calcium, phosphorus and parathyroid hormone. The calcium and phosphorus kits used were
Bio Lab kits processed by BTS-350 Biosystem while parathyroid hormone kit was Roche processed by Cobas e411. The kits used for HbA1c test were Stan Bio kits (USA).

Normal limits of investigation:

1. Serum calcium (8.5-10.5 mg/dl)
2. Serum phosphorus (adult: 2.48-4.34 mg/dl)
3. Serum parathyroid hormone (16-75 pg/ml)
4. BMI according to Asian population (17.5-23 is normal, 23-28 is overweight, >28 is obese). The laboratory investigation were done in Ibn-alhaithum private lab.

Statistical Analysis:

The data of type 2 diabetics were analyzed by application of Microsoft excel analysis were arranged in scales variables (means ± standard deviation) and in categorical variables. Chi-square test was used for comparison between categorical data (Fishers exact test applied when expected variable was less than 20% of total). Independent sample t-test was used to compare between two means. Pearson correlation test was used to assess expected relationships between different variables. The level of significance (p value) was set as ≤ 0.05.

Results

The present study included 95 patients with type 2 DM, 36 (37.9%) of them were males and 59 (62.1%) were females, and 95 apparently healthy volunteered, 48 (50.5%) of them were males and 47 (49.5%) were females. The BMI of diabetic and control groups was comparable with statistically insignificant difference, table (1).

Table-1- Distribution of diabetic and control groups according to gender and BMI

<table>
<thead>
<tr>
<th></th>
<th>Diabetic group</th>
<th>Control group</th>
<th>P-value (by Chi-Square)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>37.9</td>
<td>48</td>
</tr>
<tr>
<td>Female</td>
<td>59</td>
<td>62.1</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>21</td>
<td>22.1</td>
<td>23</td>
</tr>
<tr>
<td>Overweight</td>
<td>45</td>
<td>47.4</td>
<td>44</td>
</tr>
<tr>
<td>Obese</td>
<td>29</td>
<td>30.5</td>
<td>28</td>
</tr>
</tbody>
</table>

Table-2- show that the mean age of diabetic group was (53.53 years) while control group (54.37 years) with no significant difference. The mean of HbA1c (8.18%), S. phosphorus (3.83 mg/dl) and S. PTH (49.08 pg/ml) in diabetic group was significantly more than that in control group ( 4.45%, 3.53 mg/dl, and 42.58 pg/ml respectively). While mean of S. calcium (7.97 mg/dl) in diabetic group was significantly less than that in control group (9.19 mg/dl).

Table-2- Mean of age, HbA1c, S. calcium, S. Phosphorus and S. PTH in diabetic and control groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Diabetic group</th>
<th>Control group</th>
<th>P-value by T- test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>53.53 ± 12</td>
<td>54.37 ± 5.07</td>
<td>0.628</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>8.18 ± 1.73</td>
<td>4.45 ± 0.53</td>
<td>0.00001&gt;</td>
</tr>
<tr>
<td>S. Calcium (mg/dl)</td>
<td>7.97 ± 0.75</td>
<td>9.19 ± 0.61</td>
<td>0.00001&gt;</td>
</tr>
<tr>
<td>S. Phosphorus (mg/dl)</td>
<td>3.83 ± 0.80</td>
<td>3.53 ± 0.66</td>
<td>0.004&gt;</td>
</tr>
<tr>
<td>S PTH (pg/ml)</td>
<td>49.08 ± 21.46</td>
<td>42.58 ± 15.73</td>
<td>0.018&gt;</td>
</tr>
</tbody>
</table>
There was no significant difference between mean of S. calcium, S. phosphorus and S. PTH in diabetic patients with good control (HbA1c less than 7) and diabetic patients with bad control (HbA1c more than 7), as it showed in table (3).

Table-3- Mean of S. calcium, S. phosphorus and S. PTH in good and bad control in diabetic patients.

<table>
<thead>
<tr>
<th>HbA1c control</th>
<th>No. of patients</th>
<th>S.PTH(pg/ml) Mean ± SD</th>
<th>S. phosphorus(mg/dl) Mean ± SD</th>
<th>S. calcium(mg/dl) Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤7%</td>
<td>13</td>
<td>48.30 ± 22.92</td>
<td>3.94 ± 0.83</td>
<td>7.96 ± 0.69</td>
</tr>
<tr>
<td>7%&lt;</td>
<td>82</td>
<td>49.26 ± 21.51</td>
<td>3.85 ± 0.79</td>
<td>7.97 ± 0.75</td>
</tr>
</tbody>
</table>

P-value by T-test 0.882 0.713 0.971

Also There was no significant difference between mean of S. calcium, S. phosphorus and S. PTH in diabetic patients with different durations of diabetes mellitus, table (4).

Table-4- Mean of S. calcium, S. phosphorus and S. PTH in different durations of diabetes mellitus.

<table>
<thead>
<tr>
<th>Duration of DM (Years)</th>
<th>No. of patients</th>
<th>S.PTH(pg/ml) Mean ± SD</th>
<th>S. phosphorus(mg/dl) Mean ± SD</th>
<th>S. calcium(mg/dl) Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1</td>
<td>15</td>
<td>48.67 ± 22.01</td>
<td>3.91 ± 0.76</td>
<td>7.94 ± 0.77</td>
</tr>
<tr>
<td>1-5</td>
<td>36</td>
<td>48.96 ± 21.66</td>
<td>3.85 ± 0.80</td>
<td>7.96 ± 0.76</td>
</tr>
<tr>
<td>≥5</td>
<td>44</td>
<td>49.3 ± 21.62</td>
<td>3.85 ± 0.79</td>
<td>7.97 ± 0.76</td>
</tr>
</tbody>
</table>

P-value by ANOVA test 0.99 0.95 0.99

Table (5) show weak positive correlation between S. PTH and duration of diabetes mellitus and weak negative correlation between S. PTH and HbA1c of diabetic patients. There was significant negative correlation between S. calcium and S. phosphorus. While S. calcium and S. phosphorus revealed very week correlations with HbA1c, duration of diabetes mellitus and S. PTH.

Table-5- Correlation coefficient of S. PTH, S. calcium and S. phosphorus with HbA1c and duration of diabetes mellitus.

<table>
<thead>
<tr>
<th>Variables</th>
<th>S.PTH</th>
<th>P-value</th>
<th>S. calcium</th>
<th>P-value</th>
<th>S. phosphorus</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>-0.194</td>
<td>0.059</td>
<td>-0.025</td>
<td>0.81</td>
<td>0.052</td>
<td>0.621</td>
</tr>
<tr>
<td>Duration of DM</td>
<td>0.191</td>
<td>0.064</td>
<td>-0.021</td>
<td>0.836</td>
<td>-0.023</td>
<td>0.823</td>
</tr>
<tr>
<td>S. PTH</td>
<td>0.125</td>
<td>0.225</td>
<td>0.125</td>
<td>0.225</td>
<td>-0.097</td>
<td>0.352</td>
</tr>
<tr>
<td>S. calcium</td>
<td>0.264</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

In this study there was no significant difference in age, sex distribution and body mass index between diabetic group and control group, that mean there will be no effect of these variables on the differences occur in both groups. The present study revealed very high significant increment of HbA1c in diabetic group. HbA1c is a glycated hemoglobin that percent is effected by the level of blood glucose and it is logical to be higher in the diabetic group, beside that, HbA1c is recommended as an essential indicator for the monitoring of blood[12].

The present study revealed significant increment of serum PTH in diabetic group in comparison to control group. Previous studies indicated that the combination of hypo-vitamins is D and increased PTH seems to independently predict β-cell dysfunction, insulin resistance and hyperglycemia in diabetic and prediabetic patients[13,14,15]. Other studies suggest that level of PTH can cause β-cell dysfunction irrespective of level of vitamin D in diabetic and prediabetic patients[16,17].

The present study also revealed that serum calcium was significantly lower in diabetic group than control. In Iraq there were three studies, the first had similar results[18], the second[19] stated that there was no difference in calcium level between diabetic and control, while the third one[20] stated that calcium was higher in diabetic patients than in control. However the second study done on patients with short duration of diabetes mellitus while the sample size of the third study was small (30 diabetic and 20 control) in comparison to the present study. Many authors stated that hypomagnesaemia caused by renal failure or volume depletion are the main causes of low calcium level among diabetic patients in addition to effect of vitamin D deficiency and parathyroid hormone[21,22,23]. Other studies suggested that supplementation of population with vitamin D and calcium reduces the risk of type 2 diabetes mellitus development as insulin sensitivity increased after calcium and vitamin D intake[9,24]. Furthermore serum calcium level is involved directly with all components of metabolic syndrome and specifically affects hyperglycemia[25].

The present study revealed also significant increment of serum phosphorus in diabetic group in comparison to control. Disturbances in divalent-cation and phosphorus homeostasis are related to hyperglycemia and are thus common in patients with diabetes[26]. Also increase in serum level of phosphate may induces hypocalcaemia by interfering with phosphorus excretion in the malfunctioning kidney[27]. In addition, phosphate binds ionized calcium and removes calcium from the bloodstream. Advanced chronic renal insufficiency may be associated with hypocalcaemia due to increased phosphate level or low levels of blood vitamin D[21].

Limitation of this study: Serum vitamin D had not assessed due to limitation of resources because this study was done by the researcher own fund with no sponsors.

Conclusion

Diabetic group had significant higher level of serum PTH and phosphorus and significant lower level of serum calcium in comparison to on-diabetic group. In diabetic group, there was significant negative association between serum phosphorus and serum calcium, weak positive association between serum PTH and duration of diabetes mellitus and weak negative association between serum PTH and HbA1c, while there was no significant association between serum phosphorus and calcium with HbA1c and duration of diabetes mellitus.

Conflict of Interest - (Nil – There are “No Conflict of Interest”).

Source of Funding - By both researchers (Self).

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The Effect of Compound Exercises in the Lactic Ability in the Futsal for Female Players

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¹University of Baghdad/The college of physical education and sport sciences/Iraq

Abstract

The importance of the research lies in the importance of the physiological side and the role it plays in assessing the training and functional status of the five penthouse football players and what the trainer can do to train the training to develop the athletic ability of five-legged football players to continue the skillful performance for the longest period without feeling tired.

The problem of research in the low level of physical performance and weakness of the ability to maintain the same level as they started in the competition and this decline in the level of physical reflected clearly on the performance of the team in the skill and weakness in the speed of the implementation of the various skills required by the nature of the game during the game, the case drew the attention of the researchers and its interest to know the hidden reasons behind it in order to diagnose and try to develop solutions and appropriate treatments through a training curriculum to develop the athletic ability of the players of the five-footed football halls. The aim of the study was to identify the effect of the use of compound exercises in the athletic ability of five-legged football players.

The researchers used the experimental method in the controlled control method, experimental group, pre-test and control group for its suitability and the nature of solving the research problem. The entire community of Basrah, Al-Basrah players was selected by five football lounges as a sample and randomly divided into two groups (experimental group and control group), with five players in each group. And then make them homogeneity and equivalence for the purpose of starting from the point looked one. The researchers prepared five physical exercises in futsal, within the period of special preparation of the team to compete with 36 training units over a period of three months with (12) weeks and exercise time 30 minutes from the main section of (60) minutes.

The results were statistically significant. The researchers concluded that the Compound physical and functional exercises at (30) second and over three months resulted in an improvement in the lactic ability of the functional organs better than the traditional exercises. Therefore, the researcher recommends the need to apply and implement the Compound exercises and its time is relatively long to develop the physiological indicators of lactic ability.

Keywords: Compound exercises, lactic ability and Futsal.

Introduction

The game of Futsal of sports that require exercise. The player has some physiological qualities that enable them to continue hard training with the performance of motor skills with high efficiency, high level of accuracy, and good harmony between contraction and expansion, and the evolution and change. In the level of skill and physical is the natural result of the development of the readiness of the internal organs of the body to do the normal function, in terms of the adequacy of the circulatory system and breathing and the speed of energy processing of muscle tissue and the speed of recovery.

The high sports levels require the athlete to use their physical, skill, planning and psychological skills in an integrated manner. The aim of the sports training is to increase the physiological efficiency. The physiological
Continuous training is the only solution for the development of the level of female players in the game of five football halls that require the development of all special abilities due to the rapid development of physiological, anatomical and mental and the exploitation of physiological characteristics.\(^2\)

The maintenance of the efficiency of physical and skill performance over the period of the game is of great importance and the main bases upon which to achieve the required results as the retention of the level of skill and physical ability despite exposure to effort match or training is a clear indication of the physiological competence of the team that has this attribute in addition to the basic skills of the game, as the province of the player in the performance is one of the important steps to win the game.

The researcher noticed through the follow-up training for players of the girl of Basra and the presence of some of the competitions feeling tired and low level of physical performance and their ability to maintain the same level that started in the competition and this decline in the level of physical reflected clearly on the performance of the team in the skill and weakness in the speed of implementation skills. The different game required by the nature of the game during the two stages of the game, this situation drew the attention of the researcher and its interest to know the reasons behind the hidden for the sake of diagnosis and try to develop solutions and treatments appropriate to them through a training curriculum to develop the ability of lactic for female players in the futsal.\(^3\)

The importance of the research in the importance of the physiological side and the role of the assessment of the training and functional status of the five-player futsal, and what the coach can do to regulate the training to develop the athletic ability of the futsal to continue the performance of the skill for the longest period without feeling tired.

**Research aim:**
To identify the effect of the use of exercises in the non-athletic ability of female football players.

**Hypothesis:**
The use of Compound exercises has a positive effect on the athletic ability of female football futsal.

**Research methodology and field procedures:**

**Research Methodology:**
The researcher used the experimental method in the controlled control method, experimental group, pre-test and control group for its suitability and the nature of solving the research problem.

**Search community and sample:**
The society of the research was identified by the players of the Basra football club for the five football lounges. The total number of female footballers was 10, aged 20-22 years, and the whole society was randomly assigned to two groups (experimental group and control group) and five players in each group. And then make them homogeneity and equivalence for the purpose of starting from the point looked one.

**Means, tools and devices used in research:**
Arab and foreign sources and references.
International Internet Information Network.
Observation and experimentation.
Futsal stadium and (10) balls.
Metric measuring tape.
Colored and sticky tapes.
Wooden terraces, ropes and hoops.
Whistle.
Electronic stopwatch.
Laptop.
Video Camera.
Medical balance with ruler to measure height and weight.
Box height (40) cm.

**Test of lactic ability:**
The objective of the test is to measure the anaerobic ability for (30) second.

**Performance specifications:** The player stands against the side of the box, one of the feet is placed on the box (the man preferred by the player) while the other man is free on the ground, and when indicating the start of the timing begins the player raise the free man
and put it next to the man above the box and repeat this
performance rhythm of two times Two (one top - two
down) and the player must perform the largest number
of steps during (30) second. The step cannot be counted
if the player stumbles forward or flexes the free man.

The player counts the number of steps he
performs during (30) second which is the performance
time, and the anaerobic ability is calculated by the
following equation:

\[ \text{Ability} = \text{body weight (mass)} \times (40 \text{ cm} \times \text{number of}
\text{steps in 30 second}) \times 1.33 \]

Unit of measurement = kg. M / min.

To calculate the anaerobic capacitance ability in
real power units by watt, the output is divided into 6.12
kg. M / min, as (one watt equals 6.12 kg / m / min)

Unit of measurement (kW).

The pilot study:

The researchers conducted two exploratory
experiments on a random sample of the girls’ club
players, one for the tests to determine the time taken for
the tests and their implementation on 2-9-2018. And
the second for the Compound exercises to learn how to
implement the sections of the unit and the duration of
each exercise in the unit on 3-9-2018.

Procedures of the main experiment:

Pre Test:

The pre-test of the lactic ability of the two
research samples was conducted on 7/9-2018 with the
stabilization of all temporal and spatial conditions for
the purpose of standardization with the post-test. The
researchers extracted the homogeneity and equivalence
of the research sample through the pretests as shown in
table (1).

Table (1). Shows homogeneity and equivalence of the research sample in lactic ability.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>levenes-test</th>
<th>Sig.</th>
<th>t-test</th>
<th>Sig.</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>5</td>
<td>12347.2</td>
<td>1.79</td>
<td>0.016</td>
<td>0.903</td>
<td>0.163</td>
<td>0.874</td>
<td>Not significant</td>
</tr>
<tr>
<td>Control</td>
<td>5</td>
<td>12347.4</td>
<td>2.074</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compound exercises:

The researchers prepared physical exercises in
futsal, within the period of preparation of the preparation
of the team for competitions and the reality of (36)
training units over a period of three months and a (12)
week has included each week on (3) training modules.
The researcher identified the main part and duration (60)
d invested from 30 minutes to carry out the Compound
exercises from the beginning of each training module.
The duration of the training unit (90 d) was divided into
a preparatory part of (25) d and a final part of (5) d. The
warm-up and the final section of the training unit for both
experimental and control groups were implemented. The
experimental group is separated from the control in the
main part when the composite exercise begins.

The experimental group carries out the Compound
exercises. The control group implements the curriculum
prepared by the trainer. After the time the two groups
merge to complete the remaining components of the
training modules. In order to carry out the training,
the researcher followed the method of high frequency
high frequency training, no more than (30th) for each
frequency and frequency of (4-5) for each group and the
number of groups (2-3) according to the team level and
training condition. Approximately 120 beats per minute
before starting the next repeat.

Post-test:

The post-test of the lactic ability of the two research
samples was conducted on 15-12-2018 with the
stabilization of all temporal and spatial conditions in the
pretest.
Results and Discussions

Table (2). Shows the statistical parameters between the pre and post measurement of the two research groups in the lactic ability.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>Diff. Mean</th>
<th>SD.Diff.</th>
<th>t-test</th>
<th>Sig.</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Pretest</td>
<td>1.78</td>
<td>12347.2</td>
<td>1245.6</td>
<td>11.96</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>233.9</td>
<td>13592.8</td>
<td>232.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Pretest</td>
<td>2.07</td>
<td>12347.4</td>
<td>558.2</td>
<td>16.29</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
<td>75.36</td>
<td>12905.6</td>
<td>76.61</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From table (2) that the two types of research have evolved to have the ability to carry out athletic performance. The researcher attributed this to the repetition, repetition, regularity and continuous training in the skills of the game of five football lounges during a period of three months. The continuation of training and regularity develops the physiological abilities of the trainees the training in times of 25 to 30 seconds is designed to develop endurance and anaerobic ability, a sign of loading formation training that develops anaerobic ability.

Table (3). Shows the statistical parameters in the telemetry between the two groups in the lactic ability.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t-test</th>
<th>Sig.</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>5</td>
<td>13592.8</td>
<td>233.9</td>
<td>6.253</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Control</td>
<td>5</td>
<td>12905.6</td>
<td>75.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3) shows that the experimental group is superior to the control group in measuring the lactic ability, and the researcher attributed this to the use of Compound exercises and at (30) second. Continuing training over relatively long periods of time is developing physiological abilities, especially lactic ability. Compound and similar exercises of skill performance, combining physical and skill training in one performance, similar to the competition and within the performance times close to the actual performance time during attack and defense in the five futsal football, improves the efficiency of the internal functional organs of the individual. This is consistent with the results of the present study and the realization of its hypothesis.

That the exact cause of delayed muscular pain is still unknown, most research indicates that there is actual damage in muscle cells, and a rising release of various metabolic compounds in tissues surrounding the muscle cells. These reactions result in hard exercise into a corrective response accompanied by inflammation, resulting in swelling and pain that peaks after a day or two of hard work and fades after a few days, depending on the severity of the damage. In fact, this type of muscle contraction seems to be a major factor in late muscular pain. When you stretch a muscle to carry a heavy weight - imagine that your arms are trying to hold a very heavy weight - called contraction of the muscle then contraction concentric.

In other words, the muscle is actively retracted in an attempt to shorten its length. However, this process fails. These decentralized contractions have been shown to result in damage to the muscle cells rather than with concentric contractions, in which the muscle is successfully shortened during Contractions against
pregnancy, and therefore exercises that involve a lot of decentralized contractions - such as jogging on the slopes - will result in more severe muscle pain, even if there was no noticeable sensation of burning in the muscles during the exercise.\textsuperscript{10}

Because delayed muscular pain, which is the result of hard work, is very common, physical physiologists are looking at the potential role of anti-inflammatory drugs and other supplements to prevent and treat these muscular pains, but there are no definitive recommendations at the moment. Although anti-inflammatory drugs seem to relieve muscle pain - this is good - it can limit the muscle’s ability to treat damage, which can have adverse effects on muscle function in the weeks following hard work.\textsuperscript{11}

\textbf{Conclusions}

Continuing regular and structured training is an evolution in the non-functional ability of functional devices.

Compound exercise (physical and skill) at (30) second and over three months there is a development in the ability of lactic functional organs better than traditional exercises.

\textbf{Ethical Clearance} - Taken from University of Baghdad committee

\textbf{Source of Funding} - Self

\textbf{Conflict of Interest} - None

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Molecular Diagnosis of CD14 and MnSOD Genes and their Effect on Asthma in Holy Karbala, Iraq

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Abstract

Asthma is a chronic respiratory disease that affects the lungs, impairing air from reaching the lungs, leading to shortness of breath and severe cough. This disease is caused by environmental and genetic factors including change in CD14, MnSOD genes and others. CD14 is a high-affinity receptor for various bacterial products as lipopolysaccharides (LPS) and acts as a vector of inflammation. Blood samples were collected from 80 patients with asthma after being diagnosed by the specialist at Imam Hussein Medical Teaching Hospital, holy Karbala, Iraq, and compared with 50 apparently healthy individuals as a control group. DNA was extracted from blood samples for all study samples. Molecular detection of single nucleotide polymorphisms (SNPs) was performed in genetic sites using PCR and PCR-RFLP techniques. CD14 gene levels showed significant differences between the patients and control groups in the CC model, while no significant differences were found in CT and TT genotypes. The study showed no significant differences between the genotypes (Ala-Ala, Val-Ala, Val-Val) in patients and healthy group. The study examined the effect of certain factors such as age, sex, place of residence, smoking, family history on the rates of asthma to determine their relation to the polymorphism of the studied genes.

Keywords: PCR, PCR-RFLP, CD14, MnSOD, ROS, Asthma.

Introduction

Asthma is a complex bronchial disease caused by various environmental and genetic factors which include exposure to allergens\(^1\), viral and bacterial infections\(^2\), or airway irritants such as cigarette smoke\(^3\) and other environmental pollutants\(^4\). Genetic factors such as genes CD14, MnSOD play an important role in the incidence of asthma where CD14 is a receptor for various bacterial products, such as (LPS), and is also a mediator of inflammation\(^5\) by modulating Plasma IgE levels and may have effects on asthma related phenotypes \(^6\). This gene also has several genetic variants that may be inherited or due to exposure to environmental factors\(^7\). Humans have a large number of polymorphisms in different parts of the gene\(^8\), (MnSOD) is an ROS scavenger, which is found in the mitochondria, where it is produced naturally from metabolic processes and in an environment where antioxidants are abundant and the ability to repair. This gene breaks down DNA, lipid peroxidation, protein modulation, membrane rupture and mitochondrial damage in the case of a lack of defense mechanisms in the body, exposure to toxic agents and oxidative stress\(^9\). Other functions of this gene it catalyzes the dismutation of superoxide radicals, thereby producing hydrogen peroxide and oxygen, hydrogen peroxide may react with ferrous iron to form more cytotoxic hydroxyl radicals\(^10\). Genetic models (TT/CT) genotypes were found to be associated as compared to non-atopic children carrying the CC genotype\(^11\). The MnSOD gene contains polymorphisms (Val-Ala / Ala-Ala, Val-Val) associated with asthma, where atopic children with MnSOD (Val-Ala/Ala-Ala) genotypes linked to the risk of asthma than did non-atopic children with the MnSOD (Val-Val) genotype\(^12\).

This study aimed to test the diagnosis of individual polymorphism SNPs in the genes studied (CD14, MnSOD) as one of the main causes of asthma.

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Materials and Methods

All peripheral blood lymphocytes samples were collected from Imam Hussain Teaching Hospital in holy Karbala province, Iraq. The samples included 80 samples of asthma patients and were compared with 50 apparently healthy individuals as a control group, samples were collected from the period November 1, 2017 to April 30, 2018. The DNA was extracted using the DNA extraction unit (Bioneer, Korea). Polymerase chain reaction (PCR) were adopted for amplification of target region in the genes. Primers used for the amplification of the CD14 gene were (F: 5’- GTG CCA ACA GAT GAG GTT CAC - 3’ and (R: 5’- GCC TCT GAC AGT TTA TGT AAT C- 3’). The cycling conditions were as the following: one cycle at 94°C for 5 min, 35 cycles at 94°C for 30 s, 64°C for 30 s, 72°C for 1 min, and one final extension cycle at 72°C for 10 min. The PCR product is digested by using (AvaII). Homozygous CC had a product fragment of 497 bp, while 353-bp and 144 bp bands represented homozygous TT, and heterozygous CT has all three bands. The Primers used for the amplification of the MnSOD gene were (F: 5’- ACC AGC AGG CAG CTG GCG CCG G- 3’) and (R: 5’- GCG TTG ATG TGA GGT TCC AG- 3’). The PCR reaction had an initial melting temperature of 95°C (5 min) followed by 35 cycles of melting (95°C 1 min), annealing (61°C; 1 min), and extension (72°C; 2 min). An extension period of 7 min at 72°C followed the final cycle. PCR products in MnSOD gene were digested by the use (NgoMIV) enzyme. The Homozygous Val-Val appeared as 107 bp, bands 89bp and 18 bp referred to the homozygous Ala-Ala, and heterozygous Val-Ala had all bands.

Statistical Analysis

The results were statistically analyzed using the Special Packages of Social Since (SPSS) V.22 using the means (±) standard error value, where the significance of P≥ 0.01 and P≤ 0.05.

Results

Molecular detection of all study samples was performed using the PCR for two of the genes are CD14, MnSOD. Fig. 1. shows the electrophoresis of the CD14 gene after amplification by PCR. Where the last column represents the size marker (100-2000bp), while the rest of the bands refer to the gene CD14 of 497bp. All the products of this gene were visualized on a 2% agarose at 70 V for two hours.

The results of the molecular diagnosis were shown in Fig. 2. showing the electrophoresis of PCR products of the MnSOD gene on a 2% agarose at 70 V for two hours, while The last lane represents the size marker (100-2000bp), and the rest of the bands represent MnSOD of (107bp).
Figure 1: PCR amplification of the CD14 gene

The results of the molecular diagnosis were shown in Fig. 2, showing the electrophoresis of PCR products of the MnSOD gene on a 2% agarose gel at 70 V for two hours, while the last lane represents the size marker (25-2000bp), and the rest of the bands represent MnSOD of 107 bp.

Figure 2: PCR amplification of the MnSOD gene

Figure 3 shows the electrophoresis of the CD14 polymorphisms on agarose gel at 3% at 70 V for 2 hours, using the enzyme (AvaII) to digest the PCR product in this gene. Columns (1, 2) refer to the homozygous (CC) (497 bp), while the columns (3, 4) represent homozygous TT (353, 144 bp). The columns (5, 6 and 7) were represented heterozygous CT (497, 353, 144 bp), Column 8 was size marker (100-2000bp).

Fig. 3: PCR products of CD14 polymorphism

The results showed the distribution of samples (80 patients and 50 control group) according to risk factors in Table 1. Females had the highest incidence rate 64 (80%) and males 16 (20%) in asthma patients. Compared with the control group, males at a higher rate 28 (56%) than females 22 (44%), there was no significant difference in the sex factor between both group. 72 (90%) of those patients with no hereditary history were higher than those with a hereditary history of the disease 8 (10%). In the control group, the proportion of individuals with a hereditary history was 12 (24%) compared to 48 (96%) individuals without a genetic history. The patients residing in the city are the highest proportion 68 (85%) and for the rural patients 12 (15%), while in the control group was 40 (80%) of individuals living in the city higher than individuals living in the rural regions 10 (20%). The results also showed that the proportion of 33 (66%) smokers patients...
was higher than those who non-smokers patients 17(34%), compared with the control group in which the proportion of 63(78.75%) smokers was higher than the proportion of non-smokers 17(21.25%) the differences were highly significant among smokers and nonsmokers in patients and control group, The results also show that the highest percentage 50(62.5%) of asthma cases in the age group (20-30 years), while the age groups (40-50 years) and (50-60 years) revealed the lowest proportion 1(1.25%), while the ratios 8(10%) in the age groups (10-20 years) and 20(25%) in the age groups (30-40 years). In the control group, the lowest percentages (0%) in the age groups (10-20 years) and (50-60 years), the highest rate 29(58%) was recorded in the age group (30-40 years) followed by the percentage 18(36%) in the age group (20-30 years), While the percentage 3(6%) was recorded in the age group (40-50 years), while significant differences were observed for age groups between patients and control group.

Table (1) Distribution of patient samples and control group by risk factors

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients</th>
<th>Control groups</th>
<th>P(\text{value})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16(20)</td>
<td>28(56)</td>
<td>0.5</td>
</tr>
<tr>
<td>Female</td>
<td>64(80)</td>
<td>22(44)</td>
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<td>Family history</td>
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</tr>
<tr>
<td>+</td>
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<td>12(24)</td>
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<td>-</td>
<td>72(90)</td>
<td>48(96)</td>
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<td>68(85)</td>
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<tr>
<td>Smoker</td>
<td>63(78.75)</td>
<td>26(52)</td>
<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td>17(21.25)</td>
<td>24(48)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>10-20 years</td>
<td>8(10)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>20-30 years</td>
<td>50(62.5)</td>
<td>18(36)</td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>20(25)</td>
<td>29(58)</td>
<td></td>
</tr>
<tr>
<td>40-50 years</td>
<td>1(1.25)</td>
<td>3(6)</td>
<td></td>
</tr>
<tr>
<td>50-60 years</td>
<td>1(1.25)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows the distribution of CD14 genotypes for patients and control group. There were significant differences between patients and control group in genotype (CC). while no significant differences were found between patients and healthy in both genotypes (CT, TT).
Table (2) Distribution of CD14 genotypes in patients and control groups

<table>
<thead>
<tr>
<th>CD14 genotypes</th>
<th>Mean ± stderr</th>
<th>Mean ± stderr</th>
<th>Mean ± stderr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>0.24 ± 0.06</td>
<td>0.48 ± 0.07</td>
<td>0.28 ± 0.06</td>
</tr>
<tr>
<td>Control groups</td>
<td>0.28 ± 0.06</td>
<td>0.48 ± 0.07</td>
<td>0.24 ± 0.06</td>
</tr>
<tr>
<td>LSD</td>
<td>0.1726</td>
<td>0.1737</td>
<td>0.1476</td>
</tr>
<tr>
<td>P value)</td>
<td>0.03</td>
<td>0.1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table 3 shows the distribution of MnSOD genotypes in patients and control group, where the results of the statistical analysis showed no significant relationship between the three genotypes (Val-Val, Val-Ala, Ala-Ala)

Table (3) Distribution of MnSOD genotypes in patients and control group

<table>
<thead>
<tr>
<th>MnSOD genotypes</th>
<th>Val-Val</th>
<th>Val-Ala</th>
<th>Ala-Ala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>0.91 ± 0.03</td>
<td>0.10 ± 0.03</td>
<td>0.00 ± 0.00</td>
</tr>
<tr>
<td>Control groups</td>
<td>0.88 ± 0.04</td>
<td>0.48 ± 0.07</td>
<td>0.00 ± 0.00</td>
</tr>
<tr>
<td>LSD</td>
<td>0.1077</td>
<td>0.1114</td>
<td>0.00 ± 0.00</td>
</tr>
<tr>
<td>P value)</td>
<td>0.5</td>
<td>0.7</td>
<td>0</td>
</tr>
</tbody>
</table>

Discussion

Asthma is a chronic disease in adults and children caused by genetic changes in many genes, such as genes CD14 and MnSOD, Where the genetic changes in those genes are the most important risk factors and molecular diagnosis. CD14 plays an important role in the development of asthma and allergy among patients in the results of the current study, which is identical to the results of the study. the study show that MnSOD plays an important role in asthma and allergies but has a lower incidence of CD14 gene,. This was not consistent with the results of a study.

By collecting data for 80 patients and 50 healthy groups, the effect of some important factors on asthma rates such as sex, where the study. The results of our study showed that there is a relationship between the family history of asthma in the incidence rates among patients and control group these results agree with the results of,, where he noted that asthma is doubled when there is a family history. When examining the smoking factor was studied as an important factor in determining the effect of asthma on the incidence of asthma in the studied samples. the results of the study showed that smokers are the highest and significantly affected by asthma and bronchial reactivity than non-smokers in USA, This is consistent with the results of the current study. The results of the current study on the place of residence and its impact on the rate of asthma, the highest rate of infection was in the patients of the city and the lowest proportion in rural patients, This is due to the presence of dangerous environmental factors such as lifestyle, air pollution, household smoking, high household humidity, indoor mold growth, and water pollution. The study of age is one of the important risk factors in asthma. It is clear from the results of the present study that young people in the age group (20-30 years) are the highest proportion of the rest of the other ages due to the housing in the city and smoking and the presence of pollution and lifestyle factors, A study showed that that boys aged four to fourteen are the most affected by asthma among girls, but after puberty girls become more severe and suffer from asthma. In his study, he noted that the patients of the aged >15 years
old females who visit the hospital are three added, while the incidence is twice that of males who are age <15 years old. A study\(^2^3\) showed that patients with T-alleles are the most common in patients of the healthy in the case of nonatopic asthma, A study\(^2^4\) showed that the genotype is associated with an increased incidence of asthma and increases its genetic expression. While the results of the current study indicate that the genotype (CC) is associated morally with asthma, while the two models (CT,TT) did not show any significant effect or correlation with the disease. This difference may be due to the distribution of genotypes due to the environment\(^2^5\). The results of the present study showed that there were no significant differences between patients and Control group in the three genotypes(Val-Val, Val-Ala, Ala-Ala) in MnSOD gene.

**Conflict of Interest:** This research is a personal non-profit work and there is no conflict of interest.

**Source of Funding:** None.

**Ethical Clearance:** Ethical clearance was obtained from the Faculty Scientific Committee (College of Education for Pure Science, University of Kerbala, Iraq) to Study the effect of Lycium barbarum Polysaccharide on bone and thyroid gland in hyperlipidemic healthy male albino rats.

**References**


14. Patiño, CM.; Martinez, FD. Interactions between genes and environment in the development of


Synthesis of Silver Nanoparticles by Chemical Method and Investigated for Antibacterial Activity

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Abstract

In the current study silver nanoparticles were synthesized the use of the chemical method. Current research job has been discontinued into accordance over seem at anticancer recreation regarding seen SNPs of opposition in imitation of endemic just cancers mobile phone lines. Silver nanoparticle (AgNP) bear been aged within medicine and dentistry fit in imitation of its antimicrobial properties. AgNPs hold integrated within biomaterial between kilter in conformity with forestall and decrease biofilm formation. Due in conformity with greater surface in accordance with a total ratio or tiny particle size, it annexes lovesome antimicrobial employment except affect the mechanical property over the materials. This unique properties regarding AgNPs make these substances namely filler on choice in one-of-a-kind biomaterials whereby those circulate an integral position among enhancing the properties. This comment targets to talk about the have an effect on concerning summation over AgNPs in imitation of various biomaterials back within distinct dental applications. The evaluation of the vigorous electron microscope suggests namely the spherical silver nanoparticles are spherical along sizes ranging in the company of 11 according to after 33 nm relying on pH condition. The outcomes of X-ray alteration analysis exhibit the manifestation regarding silver nanoparticles below their understandable nature. The consequences over such lesson embellish pilot proof and SC-mixed SNPs be capable target as like as an anticancer deputations then are pregnant to conquer the boundaries regarding ordinary most cancers chemotherapy.

Keywords: Chemical way; Metal Nanoparticle; Antibacterial activity; XRD

Introduction

Nanotechnology is a greater hopeful place due to the fact regarding producing on the spot purposes within biotechnology or nanoscience (¹). Silver nanoparticles (AgNPs) are a detour in greater and extra typical hence antibiotic retailers concerning textiles, bandages, scientific units and household appliances, such as fridges and washing machines (²). Among the deep nanoscale products, the close standard nanoparticle merchandise is nanosilver. AgNPs hold been ancient due to the fact antimonials, antioxidants, antioxidants, afterward anti-inflammatory consequences (³). Nanotechnology is death with calf discipline due to the fact concerning producing recent kinds above nanomaterials for biomedical capabilities (⁴). It is defined as like the amplify concerning cells and kinky tissues in accordance with up to expectation aggregate are subdivided asleep yet have the dynamic afterward infiltrate or ruin the body’s natural tissues. Cancer suggests a larger mortality content than coronary bravery ailment and strokes (⁵). Global epidemiological shifts continue after epidemiological side-by-side in line with the booming prosperity of nearby cancers on the upper floor of the long-term visit (⁶). Leave the injured man or woman affected functionally after psychologically completed impending isolation between

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neighbors. In chemotherapy caused by the fact of cancer, multiple drug arrests (MDR) have grown in the tradition of maintaining an important risk among follow-up on the care of a person’s fitness by negatively affecting the dimensions of prosperity in relation to treatment. MDR is resistant to out-of-the-box treatment of dangerous chemotherapy drugs, as is properly the case with many cross-resistance replicas including anti-cancer capsules after quantitative maintenance of unique structures after mechanisms (7). Because of detailed cancer eradication mechanisms, limits of organic activity, and then the toxicity of MDR anxieties, modern-day chemists have failed to meet the ideal requirements because of the fact that most cancers are treated (8). Thus, in the tradition of rhythm, it is a hassle so far battle including life-threatening diseases where large deaths are thrown around the world, in this area is an urgent pleasure after raising the approach of instant or non-invasive drugs since the deal along cancer patients exhausted (9).

The absolute nanometer with respect to the superior biotechnology branches below has a distinct characteristic among most types of ruler cancers along with superlative requirements but physical methods (10). Recently, nanoparticles mainly nanoparticles (SNPs/SNP) have been widely continual due to the fact their medical services among almost cancers remedy fit to the truth related to their specific physical, physical or chemical properties, pleasure concerning installation, characterization or ground modification on the nanoscale (11). Moreover, silver has gained a giant act in relation to pastime among the scientific disciplines due to the fact regarding a widespread length upon homes secure specifically antifungal, antibacterial, antimicrobial, or antiviral (12).

Nanoparticles are constructed using a number techniques such as much chemical method, hot decomposition, the electrochemical method, microwave irradiation, laser etching (13). Although the chemical method is the easiest route between conformity together with synthesizing silver nanoparticles so is recognized between imitations together with producing a full-size range concerning hazardous by-products afterward between the end regimens in accordance with environmental incompatibility (14). These defects of the chemical method, renown because of an on the spot yet environmentally delightful path according to after synthesizing nanoparticles (15).

Fig. 1: Schematic representation of green synthesis, characterization, and biocompatibility of SC mediated biosynthesis of SNP and their potential anticancer activity 11.
Ag-NPs received a technical preference mostly used between surgical instruments, contraceptives, wear wounds, and orthopedic prostheses (16). On the lousy hand, silver has been old so a brawny antimicrobial agent because of many years. The floor plasmon resonance or antibacterial endeavor of Ag-NPs had been good according to mean natural yet inorganic chromosomes (17). Many researchers stated as Ag-NPs had been synthesized by using one of a kind methods because of potential features as biological parameters because of singular molecule detection, bactericidal labor (18). Cytoprotection about HIV-1 infected cells then experiences concerning adventurous materials (19). After interplay together with bacteria, AG-NPs synthesize the column protein precursors, the plasma membrane with the aid of its characteristic yet minimize the tiers over adenosine intracellular that carried to telephone demise (bactericidal action) (20). The permanency over nanoparticles is generally mentioned into phrases of pair standard classes on static, still yet still stabilization. Electrical permanency is executed by using the harmony about anionic species, certain as like halides, carboxylates yet polysaccharides, between metallic particles. This consequences in the formation on a duplicate electric powered seam (in fact, a diffuse electrified layer), who reasons the Colombian opposition of the nanoparticles. Static permanency is achieved by means of the emergency concerning large-scale natural materials, as repeatedly avert nanoparticles from fall fit in imitation of their mass. Polymers or substantial cations certain namely alkylammonium are examples over fixed stabilizers. The choice of the installer also lets in because of the willpower regarding rot regarding nanoparticles (21).

Material and Method

In recent years, the bio-synthesis concerning metallic nanoparticles, especially nanoparticles of silver then gold, using drive into extracts namely nano plants, has emerged as an essential issue over research among the discipline about nanotechnology (22). In vitro research on rat bosom cells have shown in conformity with bear oxidative power then impaired mitochondrial function. Exposure in imitation of AgNPs has been related along art damage in particular of the liver. No Observable Adverse Effect Level (NOAEL) above 30 mg/kg afterwards insignificant external Adverse Effect Level (LOAEL) concerning a hundred twenty-five mg/kg has been executed because regarding Ag NPs of rats. Alternate research additionally resulted from oxidative injury above AgNPs by technology about reactive oxygen kind by way of mitochondrial respiratory chain, duty in conformity with the governance after trespass within ATP generation. Such interference government in accordance after apoptotic mobile injury since DNA destruction or in the end occupy the mobile survival. Contrarily, advertisement on nasal AgNPs because over ninety days does no longer production, anybody, genetic toxicity neutral on 6 touching the driver animals. Along impaired mitochondrial characteristic with the aid of AgNPs, that nanocarriers are recognised according in accordance with motive leakage regarding the cell membranes yet trespass together with its ionic permeability, therefore pass together including the job potential. Recent lookup maintain executed its potent according in conformity with on the spot oxidative damage, immune-toxicity, cytotoxicity, yet apoptosis by means of interference on caspase exercise (23).

Evaluation about antibacterial recreation on the synthesized silver nanoparticles

The ring attachment approach ancient to stay historical amongst the manners due to the fact of the evaluation on the antibacterial interest of the synthesized silver nanoparticles. The antibacterial task over C. anguria silver nanoparticles was once as soon as evaluated among emulation according to each Gram-positive (Staphylococcus aureus) yet Gram-negative (Escherichia coli) pathogenic microorganisms. In brief, Mueller Hinton (MH) agar deteriorative plates had been prepared using unproductive 90 mm Petri dishes. MH agar used to be as soon as inoculated which includes MH juice subculture about every bacterial form or poured over the degenerated plates within consequence concerning shape a homogenous layer. Filter shipping note discs (5 mm within diameters) had been sterilized and the bad consignment over exchange discs bear been dipped among silver nanoparticle answer (10 μg/ml); imperfect had been located within silver nitrate solution then some meager discs have been dipped between C. anguria letter extract. These discs had been due to the fact breeze dried below fruitless conditions. The useless bad discs had been positioned in accordance with the seeded pinnacle tier above the MH agar plates yet hold been left because 30 min at chamber heat because committed diffusion. Kanamycin was historical hence advantageous control. Plates hold been incubated because concerning
24 h at 37°C and the zones involving ban were first rate then recorded into millimeters (24).

![Figure 2: spherical AgNPs with difference size in solution](image)

**Result and Discussion**

**Ultra violet-visible analysis**

Bio-synthesis concerning silver nanoparticle has once monitor the use of a GENESYS 10S UV spectrometer at the wave over 200 to 800 nm at one-of-a-kind instances regarding installation (1, 12, 24 then 48 hours). The land survey was repeated using silver nanoparticles installed about distinct pH (4, 7, 9, 10) or nanoparticles created at distinctive letter concentrations (1, 2, 3 ml). Distilled water was old between an empty images.

![Figure 3: The UV-Vis Spectra of (AgNPs)](image)

**Antibacterial Activity AgNPs**

Antibacterial recreation over the synthesis silver nanoparticle was well-read in opposition to bacterial strains, E. coli. The taboo zones around the silver nanoparticles, silver nitrate and letter banish disks regarding both bacterial traces was noted and reasonable afterward 20 H regarding at 37°C. The synthesised AgNPs sure in imitation of seizing enhanced antibacterial activity towards E. coli, as truly.

![Figure 4: Antibacterial activities of (1) AgNPs, (2) AgNPs 3, (3) Plant extract and (4) kanamycin against. Aureus. Illustrate by the clear zone of inhibitions produce in figures 4 and 5.](image)

X-ray Diffraction Analysis

XRD consequences are shown over Figure 6 along primary peak at 38.126, 44.142, 64.511 then 77.426° like to the 111, 200, 220 and 311 plane, respectively. The sample was once prepared by way of grinding nanoparticle particles within high-quality dust then positioned over a sample holder. The check used to be observed the usage of a 40-kV X’PERT-Goniometer including a present day over forty mA with Cu kα radiation. The scanning paint ancient was once non-stop together with the survey measure 2 beyond as regards four tiers in imitation of in relation to 89 degrees. The present images had been in contrast including the Joint Commission of the Library concerning Powder Buffer Standards in conformity with reckon the clear structure.
Fig. 6: X-ray diffraction shows the intensity of the peaks as a function of the diffraction angles.

Conclusion

AgNPs show special biological houses unlike sordid biomaterials robotically back between dentistry then execute worship as like a new software in the restorative dentistry, prosthetic dentistry, endodontics, implantology, oral cancers and periodontology. AgNPs hold comprehensive potent fit in conformity with theirs antimicrobial, antiviral, antifungal actions. This awkward chemistry approach has evolved in conformity along the science concerning SNPs together with particle elevation properties and required stability. The biocompatible behavior upstairs gauche SNPs is synthesized fabulous into pursuance about the lack above cell toxicity between competition in conformity with ethnical fibroblasts yet erythrocytes into the blood. The phytochemicals present within the drive within fabric at last not solely result on the wonderful reduction respecting silver nitrate of pursuance along the SNPs then again also work namely like a financial institution thing building the make-up biocompatible in accordance in imitation of the nanoparticles. The between vitro anti-cancer assay concerning SNPs established a dose-dependent anti-cancer effect between the cognizance measure above 2-78 μg / ml towards ethnic cancer cellular phone lines, for this reason confirming its intensive anti-cancer activity.

Ethical Clearance: People identified as potential research participants because of their status as relatives or carers of patient’s research participants by virtue of their professional role in the university and departments.

Source of Funding: Self-Funding

Conflict of Interests: The authors declare there is no conflict interests.

References


Correlation between the Levels of Coxsackie Virus B IgG Antibody with the Glutamic Acid Decarboxylase Auto Antibodies and with Pro-inflammatory Cytokines in Type 1 Diabetes Mellitus Patients

Mohammed Abdulkadhim Sayah¹, Musa Nima Mezher¹

¹Biology Department, University of Kufa, Iraq

Abstract

Background: Coxsackievirus B (CVB) which belong to enterovirus, has been widely implicated into triggering of Type 1 Diabetes Mellitus disease through many suggested mechanisms. This study was designed to investigating and understanding the relationship between CVB infection and inducing Type 1 Diabetes disease via estimation of many parameters within patients’ serum like Anti-Glutamic acid decarboxylase autoantibody and proinflammatory cytokines (TNF- and IL-6) that induced upon CVB infection.

Patients and Method: A case-control study included 58 of diabetes mellitus type 1 patients and 30 normal control. All patients were diagnosed according to clinical history and the patients and control subjected to estimation of (Anti-CVB IgG, Anti-Gad, TNF- α and IL-6) within serum via ELISA assay.

Results: The frequencies of (Anti-Gad, TNF- α and IL-6) showed higher levels among T1D patients in comparison to control and these parameters revealed significant association with high level of Anti-CVB IgG among patients.

Conclusion: The high level of (Anti-Gad) and (TNF- α and IL-6) within CVB-T1D patients may indicated the possible role CVB viruses in the inducing autoimmunity disorder of T1D.

Keyword: Coxsackievirus B; β-cells; Glutamic acid decarboxylase autoantibody; Type 1 Diabetes Mellitus; TNF- α; IL-6

Introduction

Type 1 diabetes, called insulin dependent diabetes mellitus (IDDM) is caused by lack of insulin secretion by beta cells of the pancreas¹. T1D results from the destruction of insulin-producing β-cells by a specific autoimmune process². The destruction of β-cells attributed to a variety of environmental and genetic risk factors³.

Type 1 diabetes accounts for about 5-10% of all patients with diabetes. It is estimated that 1,106,500 people ages 0 to 19 years have type 1 diabetes worldwide, with 132,600 newly diagnosed cases each year⁴. Worldwide, the incidence of type 1 diabetes is increasing by 3% every year, although the reasons for this are unclear⁵,⁶.

The etiology is multifactorial, however, the specific roles for genetic susceptibility, environmental factors and immune system in the pathogenic processes underlying type 1 diabetes remain unidentified⁷. In susceptible individuals, environmental factors like viruses may trigger the immune-mediated destruction of pancreatic β-cells⁸.

Enteroviruses, especially CVB, are among the viruses was more likely to be involved in the pathogenesis of the T1D disease⁹,¹⁰.

CVB non-enveloped viruses containing a positive, ss RNA genome of ~7.5 kb that encodes a single open reading frame flanked by 5’ and 3’ un translated regions
The genome is packaged into a viral capsid of ~30 nm in size. There are many possible mechanisms of β-cells destruction have been proposed upon CVB infection like cytolytic activity, bystander activation damage, prolonged inflammation due to persistent infection and molecular mimicry due to partial homology. Immune response to GAD in type I diabetic patients suggests that anti-GAD antibody may be considered as an autoimmune marker. Antibodies directed against the enzyme glutamic acid decarboxylase (GAD) are believed to be the main cause of destruction of pancreatic β cells in type I diabetes mellitus. The production of inflammatory cytokines upon CVB infection has been also suggested to be contributed with the autoimmune reactions associated with β cell damage that leads to development of T1DM.

Material and Method

Patients and methods

Fifty-eight serum samples were obtained from T1DM with clinical history who attended to diabetic center in Al-sadder hospital, aldwiwyah hospital and some private laboratories, patients, (34 males, 24 female), with an age range of (7-25) years. The healthy control group included 30 serum samples, (18 males, 12 female) and they were age matched with the study group. Serum sample stored at (-20 c) until assayed.

1- Sandwich enzyme-linked immunosorbent one-step (Elisa)

Human Anti-Coxsackie virus antibody (IgG) ELISA Kit (Qayee-Bio, CVB-IgG, china) used to assay the level of the anti-covxsackie virus IgG in samples. The instructions of the manufacture were followed for the procedure.

2- Solid phase ELISA for human anti-Gad auto antibodies detection

The anti-Gad autoantibody were assed using ELISA kit assay (Qayee-Bio, anti-gad, china) which provides a quantitative assessment for human auto-antibodies against GAD in serum. The instructions of the manufacture were followed for the procedure.

3- Sandwich enzyme-linked immunosorbent assay

Human tumor necrosis factor alpha Elisa kit (ELABSCINCE, TNF-α, China) used to detect level of TNF-α within samples. The instructions of the manufacture were followed for the procedure.

4-Sandwich enzyme-linked immunosorbent assay

Human interleukin 6 Elisa kit (ELABSCINCE, IL-6, China) Used to detect level of IL-6 within samples. The instructions of the manufacture were followed for the procedure.

Statistical Analysis

Data were analyzed by using the (Graph pad prism statistics 8). One-way analysis of variance (ANOVA) was used to test differences between the means of different variables and T- test was used to evaluate the differences between two groups.

Values of p < 0.05 were considered to be statistically significant and results were expressed as means ± standard deviation (SD). Correlations between IgG, IL-6, anti-gad and TNF-α were determined using the Pearson correlation coefficients.

Result

The Elisa assay revealed the high increase of (anti CVB-IgG, Anti-Gad, TNF-α and IL-6) levels within T1D patient’s serum in compare to healthy groups, with significant difference at p<0.05 as shown in tables (1,2,3,4) respectively.

1- Serological assays of parameters

Table 1. Mean serum level of IgG in DM1 patient and control.

<table>
<thead>
<tr>
<th>sample</th>
<th>No</th>
<th>Mean serum ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>58</td>
<td>67.4±8.2</td>
</tr>
<tr>
<td>control</td>
<td>30</td>
<td>24.2±3.3</td>
</tr>
<tr>
<td>P value</td>
<td>&lt; 0.05</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Table 2. Mean serum level of anti-gad in DM1 patient and control

<table>
<thead>
<tr>
<th>sample</th>
<th>No</th>
<th>Mean Serum ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>58</td>
<td>183.9±6.2</td>
</tr>
<tr>
<td>control</td>
<td>30</td>
<td>53.2±5.3</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>&lt; 0.05 Significant</td>
</tr>
</tbody>
</table>

Table 3. Mean serum level of TNF-α in DM1 patient and control.

<table>
<thead>
<tr>
<th>sample</th>
<th>No</th>
<th>Mean Serum ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>58</td>
<td>107.3±8.6</td>
</tr>
<tr>
<td>control</td>
<td>30</td>
<td>44.5±3.7</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>&lt; 0.05 Significant</td>
</tr>
</tbody>
</table>

Table 4. Mean serum level of IL-6 in DM1 patient and control

<table>
<thead>
<tr>
<th>sample</th>
<th>No</th>
<th>Mean Serum ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>58</td>
<td>157.6±7.5</td>
</tr>
<tr>
<td>control</td>
<td>30</td>
<td>51.2±2.1</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>&lt; 0.05 Significant</td>
</tr>
</tbody>
</table>

2- Correlation tests between parameters:

The result of correlations test was positive between (IgG and Anti-Gad), (IgG and TNF-α), (IgG and IL-6) and (TNF-α and IL-6) This correlation was significant as shown in table (5).

Table 5: Correlation between four immunological parameters assay associated with diabetic patients.

<table>
<thead>
<tr>
<th>Immunological parameters correlation test</th>
<th>Item</th>
<th>R value</th>
<th>P value</th>
<th>Significant **</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IgG &amp; anti-gad</td>
<td>0.596</td>
<td>0.01</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>IgG &amp; TNF-α</td>
<td>0.62</td>
<td>0.01</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>IgG &amp; IL-6</td>
<td>0.65</td>
<td>0.01</td>
<td>significant</td>
</tr>
<tr>
<td></td>
<td>IL-6 &amp; TNF-α</td>
<td>0.58</td>
<td>0.01</td>
<td>significant</td>
</tr>
</tbody>
</table>

Correlation significant at (** p value at 0.01)

R value: coefficient of correlation.

Discussion

The study revealed IgG and anti-GAD auto-antibodies showed a significant increase in serum level within T1D-CVB patients, in comparison to the control group as shown in tables (1,2) respectively.

These result agreed with result of Bason et al; Frisk and Tuvemo who referred to observable increased of autoantibody (anti-Gad) in seropositive CVB in T1D patients.

While the result disagreed with Heino et al which revealed there was no differences between autoantibody in diabetic patients who infected with CVB and control.

The positive correlation between CVB infection and high level of Anti-gad that shown in figure (5) may due to partial similarity between P2-C protein sequence of CVB with human GAD. This molecular mimicry suggested to induce cross reactivity response representing by anti-gad autoantibody and auto reactive T-cells activated upon CVB infection, which might act as strong enhancers that may accelerate or aggravate the ongoing autoimmune response against β-cells leading to T1D progression.

The result also revealed that proinflammatory cytokines (TNF-α & -IL-6) showed significant increase within serum of T1D-CVB infected patients compared to the control group as shown in tables (3,4) respectively.

These result agreed with results of van der Werf et al and Ghazarian et al who referred to observable increased production of TNF-α and IL-6 upon CVB.
infection in T1D diabetic patients.

But it disagreed with result of Abdel-Latif et al\textsuperscript{23} who revealed there was no change in induction of IL-6 between CVB related diabetic and another form of diabetic person.

However, result showed Significant Positive correlation between proinflammatory cytokines and IgG and between them as shown in table(5).

The high levels of proinflammatory cytokines that associated with seropositive CVB-T1D patients was suggested to play an important role in the pathogenesis of insulin development diabetes mellitus. It is well documented that TNF-α can be cytotoxic, cytostatic since it inhibits insulin synthesis and secretion. Additionally, TNF-α and IL-6 mediated damage to micro-and macro vascular tissues\textsuperscript{24}.

Beside that CVB could induce dysregulated cytokine secretion which might result in inflammatory and autoimmune diseases like T1D\textsuperscript{25}.

High concentration of IL-6 would damage β-cells and promote apoptosis. The cytotoxicity of high IL-6 concentrations could up regulate the expression of cleaved caspase-3 and ultimately leads to cell destruction\textsuperscript{26}.

TNF-α has been proposed as a central player in inflammatory cell activation and recruitment and is thought to play a critical role in the development of many chronic inflammation and tissue destruction disorder especially involvement with T1D pathogenesis and it has been suggested that TNF-α induces β cell apoptosis\textsuperscript{27}.

**Conclusion**

The high levels of CBV– IgG antibodies in serum of T1D patients and their correlation to the high levels of anti-gad auto antibodies, and high levels of proinflammatory cytokines may refer to the potential role of these viruses in triggering multiple mechanisms that induce pathogenesis of T1D ultimately.

**Funding:** The fund of this manuscript by authors itself.

**Conflict of Interest:** There was no any conflict of interest in this work.

**Ethical Considerations:** We confirm that we received approval from all patients in this study.

**References**


Application of Gallic Acid Enhances Alveolar Socket Healing

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Abstract

Background: Alveolar bone regeneration can be guided by the application of a Gallic acid following tooth extraction.

Aim of the study: The present study was designed to evaluate the histological and immunohistochemical aspects of socket healing in extraction site received Gallic acid, compared with control site that healed spontaneously.

Materials and Method: Twelfth Sprague-Dawley male rats were subjected for a surgical tooth extraction of upper central teeth of both sides. The right side be the control one as the socket healed spontaneously. while left side treated with 3μL of Gallic acid. The rats were scarificated at 14 and 28 days post extraction. Socket healing was examined histologically and evaluate immuno-expression of osteocalcin.

Results: Experimental site illustrates trabecular bones formation between the peripheral and central regions of the sockets at 14 day and increment of bone formation was observed, filled most of socket at 28 days. Results show intense positive expression of osteocalcin by bone cell in experimental group in comparison to control. The results confirmed by statistic analysis of the data, which revealed a high significant difference in the mean of positive cells specifically at day 14 postoperative.

Conclusion: The present study, highlighted on osseo-inductive and angiogenesis effect of the local application of gallic acid in socket healing.

Keywords: alveolar bone, bone regeneration, socket healing, Gallic acid, osteocalcin, tooth extraction

Introduction

Tooth extractions cause tissue injuries by mechanical damage in bony socket walls and laceration of soft tissue with a wound left exposed to the oral cavity. Gallic acid is a natural phytochemical found in gallnuts, sumac, witch hazel, tea leaves, oak bark, and other plants and have a variety of cellular functions with have protective effects against chronic diseases, such as cancer and metabolic syndrome. The beneficial effects of gallic acid illustrate on human skin, anti-inflammatory, anti-oxidant, anticancer, and anti-aging. Furthermore, several clinical trials and biomedical researches have evaluated the effectiveness and the powerful health benefits of gallic acid.

Osteocalcin is the seventh most abundant protein in human bone, and the most abundant non-collagenous bone protein, accounting for 10–20% of them.

Osteocalcin is a small protein synthesized by mature osteoblasts, odontoblasts, and hypertrophic chondrocytes. And is generally regarded as a sensitive and specific marker of osteoblastic activity, thus reflects the rate of bone formation. In the present study, the effect of gallic acid on tooth-extraction wound healing is investigated histologically with identification of immuno-expression of osteocalcin.

DOI Number: 10.5958/0976-5506.2019.02055.2
Materials and Method

Animals

Twelfth Sprague-Dawley male rats aged (10–13-week) and weight (260–300 g) were kept in the animal department of (National Center of Drug Control and Research /Iraq) at a constant humidity and temperature of 23°C according to the National Council’s guide for the care of laboratory animals. The rats were subjected for a surgical tooth extraction of upper central incisors (right side was considered as control site, that tooth socket healed spontaneously, while left side (experimental site) received 3μL of gallic acid.

Materials

Gallic acid (3,4,5-trihydroxybenzoic acid) (ab142880) soluble in water to 50mM.

Anti-Osteocalcin antibody [OC4-30][ab13418].

Methods

Surgical procedure

After anesthetizing the animal by general anesthesia the upper left and right central incisors extracted by simple extraction without trauma. The left socket treated with a 3μL of gallic acid as experimental site, while the right one left without treatment (control). The two sockets were sutured with black silk suture. Rats were sacrificed at 14 and 28 days post-extraction for the analysis of the extraction sites. (n=6 in each group at different sacrificed time point).

Histological Examination and Assessment

The premaxilla were resected cutting till the end of dental canal, fixed in 10% buffered formalin, decalcified in 10% formic acid, dehydrated and embedding in paraffin wax then serial cut 5μm cross section and stained with Hematoxylin and Eosin (H&E) for histological study. Other similar sections were taken for immunohistochemical analysis to assess the expression of osteocalcin.

Histomorphometry was used to assess the amount of new bone formation, by estimation of trabecular separation (Tb.Sp, in microns) in different portions of socket healing (coronal, middle and apical), each section was evaluated by 2 independent examiners at 10x.

Immunohistochemical scoring of osteocalcin

Quantification method of Immuno-reactivity was estimated for positive cell that expressed osteocalcin. It was assessed by identifying and scoring 100 cells in five fields (X40) along examined area of different sections, the scoring is: (Score 0, none; score 1, <10%; score 2, 10-50%; score 3, 51-80%; score 4, >80%).

Statistic Analysis

The data were analyzed using one-way ANOVA test with multiple comparisons by (LSD Method).

Results

Histological findings revealed an absence of inflammatory cells in all studied sites, whereas bone formation varied in the experimental compared to control and according to different periods.

At 14 day post extraction period, histological feature for control site shows few, sparse bone trabeculae at apical portion of socket. At 28 day a thin bone trabeculae found in apical and few in middle portion of the socket.

At 14 day post extraction period, histological view illustrates trabecular bone formation with active angiogenesis. At 28 day a new bone filled and coalesce with socket bone.

Statistic analysis show less record for trabecular separation measurement in experimental site in comparism to control. And in the apical portion for both studied sites in comparism to other portions. Moreover, trabecular separation measurement decreased as the period proceed in both control and experimental sites with a high significant value.

Immunohistochemical findings revealed a positive expression of osteocalcin by bone mesenchymal stem cell, bone cells (include osteoblast, osteocyte) in both study groups but in different scoring and in different periods.

Results show intense positive expression of osteocalcin by newly bone tissue in experimental group with a high significant difference in the mean of positive cells specifically at day 14 postoperative in comparism to control.
Figure (1) Socket healing for control
A. Sparse of bone trabeculae in apical portion of socket at 14 day. H&E x10
B. Bone trabeculae (BT) in apical and middle portions of socket at 28 day. H&E x10

Figure (2) Socket healing for experimental
A. View for bone trabeculae lined by osteoblast (black arrow) and new blood vessels (blue arrow) at 14 day post operatively. H&E x20
B. New bone (NB) filled and coalesce with socket bone (SB) at 28 day post operatively. H&E x10
### Table 1: Trabecular separation in different portions of socket healing with ANOVA test

<table>
<thead>
<tr>
<th>Portions</th>
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<tr>
<td></td>
<td>14 day Mean</td>
<td>S.E</td>
<td>28 day Mean</td>
<td>S.E</td>
<td>14 day Mean</td>
<td>S.E</td>
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<tr>
<td>Coronal</td>
<td>13.20</td>
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<td>10.5</td>
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<tr>
<td>Middle</td>
<td>12</td>
<td>.41</td>
<td>8.70</td>
<td>.23</td>
<td>20.5</td>
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<tr>
<td>Apical</td>
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<td>.62</td>
<td>7.25</td>
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**ANOVA TEST**

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<thead>
<tr>
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<th>df</th>
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<th>P</th>
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<tr>
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<td>432.13</td>
<td>208.279</td>
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<td>Portions (Coronal, Middle, apical)</td>
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<td>300.43</td>
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<td>Days (14, 28)</td>
<td>2</td>
<td>266.79</td>
<td>130.481</td>
<td>P≤0.01</td>
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</table>

(*) P≤0.01 high significant

Figure (3) Immunohistochemical view for expression of osteocalcin in control at 28 day. osteoblast=blue arrow, osteocyte=red arrow. DABx4

Figure (4) Immunohistochemical view for expression of osteocalcin in experiment At 28 day postoperatively. osteoblast=red arrow; osteocyte=white arrow. DAB x10
### Table (2): Observed Frequencies of the Studied immunohistochemical scoring of osteocalcin in different groups by different (S.O.V.) with LSD.

<table>
<thead>
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<th>28Days</th>
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<td></td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Control</td>
<td>Score - 1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Score - 2</td>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>Score - 3</td>
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<td>0</td>
</tr>
<tr>
<td>Exp.</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Score - 2</td>
<td>2</td>
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<tr>
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<td>1</td>
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<td>Score - 4</td>
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<table>
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<tr>
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<th>Mean Difference</th>
<th>Sig.(*)</th>
<th>C.S.</th>
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<tbody>
<tr>
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<td>Experm.</td>
<td>-0.87</td>
<td>0.910</td>
<td>HS</td>
</tr>
<tr>
<td>28 day</td>
<td>Control</td>
<td>Experm.</td>
<td>-0.22</td>
<td>1.321</td>
<td>NS</td>
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</table>

### Discussion

Healing of extracted wound is a complex physiological process involving a coordinated interaction of hematopoietic cells, immune cells that involved in clot plug, with development of new blood vessels and bone cell precursors. Multiple factors share the regulation of socket healing at molecular events, which affects different stages in the development of osteoblast, endothelial, epithelial lineages during multiple processes such as migration, proliferation, chemotaxis, differentiation and protein synthesis[11,12].

In present findings the experimental site illustrates trabecular bones formation in the peripheral and central regions of the sockets and bone formation was observed, filled most of socket at 28 days, these results may explained on the base of the followings:

Gallic acid exhibit antioxidant property and anti inflammatory, antimicrobial action[5] promote a regenerative response by its effectiveness for acceleration of osteoblasts growth[3].

its potential role in preserving osteogenic mesenchymal stem cells, by its ability to enhance angiogenesis. As gallic acid may play an important role in angiogenesis and granulation tissue formation specifically at early healing stage after tooth extraction to initiate alveolar bone repair.

In present study, mesenchymal stem cells seem to differentiate directly into osteoblasts, which secrete an osteoid matrix to form bone[13,14], this process illustrates obviously in 14 days duration of socket healing. Furthermore, application of gallic acid has been associated with some of biological activities such as angiogenesis that enhance vascularization and promote bone formation, therefore, statistic analysis records less trabecular separation measurement in experimental site in comparisum to control.
Higher expression of osteocalcin is observed in the experimental group by newly formed bone at 14 days post operative period by enhancing osteoblast activity\(^ {15}\). Thus, osteocalcin protein is a specific product of the osteoblast and indicates that application of gallic acid may accepted as a marker of osteoblastic activity\(^ {16,17}\) and resulted in enhancement of new bone formation more rapid than a self-limiting process in control and may be useful in clinical medicine.

**Conclusion**

Our results demonstrate that gallic acid might be a viable for socket healing agent and a potential intervention to bone formation.

**Ethical Clearance**- all work of this study had done according to the National Council’s guide for the care of laboratory animals.

**Source of Funding**- by ours

**Conflict of Interest** - nil

**References**


Pesticide Poisoning in Farmers and Its Risk Factors in Tolai Village, Parigi Moutong Regency, Indonesia

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Abstract

The use of pesticides that do not conform to recommendations have a negative impact on health and the environment. The purpose of this study was to determine the relationship between age, duration of spraying, dosage, position of spraying and the use of personal protective equipment with pesticide poisoning on farmers in Tolai Village. This study was an observational study with cross sectional design. A sample of 96 people was obtained by purposive sampling technique. Independent variables include age, duration of spraying, dosage, spraying action, use of personal protective equipment, while the dependent variable is pesticide poisoning. The results showed that 20.8% of respondents were poisoned with <75% cholinesterase levels. Knowledge and behavior of farmers about the use of pesticides was still low such as the length of pesticide spraying > 3 hours (20.8%), dosage dosage > 0.5/10 liters of water (34.4%), the position of spraying is not in the direction of the wind (33.3%) and use of incomplete personal protective equipment (86.5%). Factors associated with pesticide poisoning were the length of spraying (p= 0.000), dose (p= 0.003), spraying position (p= 0.041), but not related to age (p = 0.683) and use of personal protective equipment (p= 0.461). Conclusion, there was a relationship between the length of spraying, dosage and position of spraying with pesticide poisoning on farmers in Tolai Village.

Keywords: Risk Factors, Pesticide Poisoning, Farmers.

Introduction

The use of pesticides that do not conform to recommendations can have a negative impact on health and the environment. Pesticide poisoning can be recognized by the cholinesterase test¹. Cholinesterases are the target enzymes of numerous pesticides and chemical warfare agents and have been used for over two decades in the detection of these compounds². The prevalence of abnormal cholinesterase levels varies between regions, farmers who experience pesticide poisoning in Central Benin amount to 60.61%³. In migrant farm workers from Cambodia after workplace exposure on fruit plantations in eastern Thailand only 4.4% had normal levels of cholinesterase activity, 20.5% had slightly reduced levels, 58.5% had markedly reduced levels and were “at risk,” and 16.6% who had highest levels of cholinesterase inhibition were deemed to be in an “unsafe” range⁴. We examined the effects of pesticides in migrant farm workers from Cambodia after workplace exposure on fruit plantations in eastern Thailand. Methods: We studied 891 migrant farm workers employed on pineapple, durian, and rambutan plantations in Thailand. Data were collected via a detailed questionnaire survey and measurements of serum cholinesterase level (SChE). In Thailand abnormal acetyl cholinesterase erythrocytes amount to 12.5%⁵. Results: A total of 6,222

DOI Number: 10.5958/0976-5506.2019.02056.4
to pesticides causes sustained oxidative stress. In addition, workers (41 men and 9 women) and oxidative stress. Blood samples from 50 rural various pesticides and the presence of DNA damage observed. The objective of this study is to investigate and mutagenic capacity of these substances can be non-pesticide users. Pesticides cause DNA damage and oxidative stress. The effects of exposure to pesticides cause DNA damage and oxidative stress 16including different types of cancer, since the genotoxic and mutagenic capacity of these substances can be observed. The objective of this study is to investigate the relation between the occupational exposure to various pesticides and the presence of DNA damage and oxidative stress. Blood samples from 50 rural workers (41 men and 9 women) 17. Long-term exposure to pesticides causes sustained oxidative stress 18and oxidative stress is often claimed as one of the underlying mechanisms. In fact, different pesticides have been reported to induce oxidative stress due to the generation of free radicals and/or alteration in antioxidant defense enzymes. The present study examined greenhouse workers regularly exposed to diverse pesticides under integrated production system, and a group of controls of the same geographic area without any chemical exposure. Two different periods of the same crop season were assessed, one of high exposure (with greater use of pesticides).

The pesticide residue exceeds the maximum residual limit at 4% eggplant, 44% tomato, and 19% chilli 19. Chlorpyrifos methyl and pirimiphos methyl are the most commonly detected residues 20. Highly dangerous and prohibited pesticides are still used in Tegal Regency with a high level 21.2. Spraying farmers are one of the populations at risk of experiencing pesticide poisoning due to agricultural activities that are very close to pesticides. Various factors related to the risk of pesticide poisoning to farmers are due to the length of work 22, knowledge of pesticides and smoking when spraying pesticides 23, working time of farmers, frequency of spraying, level of knowledge of farmers 10, the direction of the spray against the wind direction and the mixing of the types of pesticides. The absence of publications on the prevalence of pesticide poisoning and the factors that influence the basis of this research are carried out.

The purpose of this study was to determine the relationship of risk factors for age, duration of spraying, dosage, spraying position and use of personal protective equipment against pesticide poisoning in farmers in Tolai Village.

Material and Method

This study was an observational study with cross sectional design. It was held in Tolai Village, Torue District on September - November, 2018. The population in this study were all farmers in Torue Village with 2,539 people. A sample of 96 people was obtained by purposive sampling technique. Independent variables include age, duration of spraying, dosage, spraying action, use of personal protective equipment, while the dependent variable includes pesticide poisoning (Table 1). Data collection used a questionnaire and tintometer kit. Cholinesterase levels are measured by a tintometer kit 24,25,26.
Data Analysis

Univariate analysis to describe the variable age, duration of spraying, dosage, spraying action, use of personal protective equipment and pesticide poisoning. Bivariate analysis of Chi Square Test (p < 0.05)

Results

Based on table 2, respondents were more than 38 years old as many as 61.5%. In general, spraying pesticides is good <3 hours a day (79.2%). More than half of the respondents (65.6%) have mixed pesticides with the appropriate dosage. The position of spraying pesticides is mostly done well (66.7%). However, in general do not use complete personal protective equipment when spraying (86.5%). Blood cholinesterase enzyme examination level <75% was found in 20 respondents (20.8%). This means that there are 20.8% of farmers who experience pesticide poisoning in Tolai Village.

Table 3 shows that there was no relationship between age and pesticide poisoning on (p= 0.683). There was a relationship between the duration of spraying with pesticide poisoning on farmers (p= 0,000). Based on the results of the chi-square test obtained a value of p = 0.003 so that it can be seen that there is a relationship between the dose with pesticide poisoning on farmers (p= 0.041).

Discussions

The results of statistical analysis in the study revealed that several risk factors showed a relationship with pesticide poisoning with a value of p <0.05, among others: duration of spraying, dosage, spraying position, while age and the use of personal protective equipment were known to have no relationship with p> 0.05.

Age is one of the demographic factors that influence one’s perception and health condition. This indicates that spraying pesticides can be done by respondents aged young to old. Based on the test results obtained p value = 0.683 (p> 0.05) so that it can be seen there was no relationship between age and pesticide poisoning on farmers. Zakaria (2007) who stated that there was no relationship between age and pesticide poisoning (p= 0.209) in pest spraying farmers in Pedeslohor Village. Likewise, Rahmawati & Martiana’s (2014) study showed no influence between age and cholinesterase levels (p= 0.194) on rice farmers in Sumberejo Village. This is in line with Bahadur’s research on tea farmers in West Bengal India who stated that age does not affect the activity of the cholinesterase enzyme.

The duration of pesticide exposure to organophosphate pesticide poisoning, sometimes cholinesterase blockade still occurs for 2-6 weeks. Continuous exposure is more dangerous than intermittent exposure at the same time. In this study the duration of spraying was related to pesticide poisoning on farmers (p= 0,000). Similarly, according to Zulmi, which states that the duration of spraying (p= 0,000) is related to cholinesterase activity, the duration of spraying has the strongest relationship with the incidence of poisoning of pesticides which is characterized by a decrease in cholinesterase. Yuniastuti & Istianah’s (2017) who stated a significant correlation between length of work (p= 0.044) and pesticide poisoning in farmers in Brebes Regency. The duration of spraying was related to pesticide poisoning on farmers (p= 0.000). Similarly, according to Zulmi, which states that the duration of spraying (p= 0.000) is related to cholinesterase activity, the duration of spraying has the strongest relationship with the incidence of poisoning of pesticides which is characterized by a decrease in cholinesterase. Yuniastuti & Istianah’s (2017) who stated a significant correlation between length of work (p= 0.044) and pesticide poisoning in farmers in Brebes Regency. The duration of spraying was related to pesticide poisoning on farmers (p= 0.000). Similarly, according to Zulmi, which states that the duration of spraying (p= 0.000) is related to cholinesterase activity, the duration of spraying has the strongest relationship with the incidence of poisoning of pesticides which is characterized by a decrease in cholinesterase. Yuniastuti & Istianah’s (2017) who stated a significant correlation between length of work (p= 0.044) and pesticide poisoning in farmers in Brebes Regency.

Based on the results that there was a relationship between the dose and pesticide poisoning on farmers. Suparti et al. (2016) who stated that the pesticide dose (p= 0.002) was proven to be a risk factor for organophosphate poisoning. The habits of farmers by increasing the dosage of pesticides used is the farmers’ effort to eradicate pests and diseases that damage crops or if they threaten crop yields. In Tolai Village, some farmers mix pesticides not according to the recommended dosage because if the pesticide cannot kill the pest, the farmer will increase the dose, then if the pest cannot yet be handled, the farmer will mix one pesticide with the
The use of Personal Protective Equipment (PPE) when spraying can affect the number of pesticide particles entering the sprayer body. Personal protective equipment that must be used when spraying includes masks, long sleeves, and gloves. The more complete the PPE used when spraying, the more likely the abnormal cholinesterase level will be smaller\(^2\). There was no relationship between the use of personal protective equipment and pesticide poisoning on farmers. Zuraida (2012) who stated that there was no association of PPE with pesticide poisoning \((p=0.680)\) on farmers. The farmers in this area used incomplete PPE, they only used an average of 3 PPE in the form of long sleeves, masks and hats\(^3\). Farmers generally assume that using personal protection when handling pesticides is impractical and is considered troublesome. If the tool is not used, then this pesticide will enter through the skin, and respiratory tract. Pesticides are generally contact poisons, therefore the use of personal protective equipment for farmers when spraying is very important to avoid direct contact with pesticides.

### Table 1 Variable Definition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Method</th>
<th>Measuring Tool</th>
<th>Results</th>
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<tr>
<td>Age</td>
<td>Interview</td>
<td>Questionnaire</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>2=&gt;38 Years</td>
</tr>
<tr>
<td>The duration of spraying</td>
<td>Interview</td>
<td>Questionnaire</td>
<td>1= Good if ≤ 3 hours per day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2= Poor if &gt; 3 hours per day</td>
</tr>
<tr>
<td>Dosage</td>
<td>Interview</td>
<td>Questionnaire</td>
<td>1= appropriate if 0.5 liters of pesticide are mixed with 10 liters of water</td>
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<tr>
<td></td>
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<td></td>
<td>2= inappropriate if 0.5 liters of pesticide are not mixed with 10 liters</td>
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<tr>
<td>Spraying position</td>
<td>Interview/observation</td>
<td>Questionnaire</td>
<td>1= good if spraying in parallel with the wind direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2= not good when spraying opposite the wind direction</td>
</tr>
<tr>
<td>The use of personal protective equipment is a tool used to protect the body from exposure to pesticides including masks, boots, long-sleeved shirts, trousers, hats, gloves and glasses</td>
<td>Observation</td>
<td>Questionnaire</td>
<td>1= complete</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>2= incomplete</td>
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<td>Pesticide poisoning</td>
<td>blood cholinesterase enzyme test</td>
<td>Tintometer Kit</td>
<td>1= No Poisoning if blood cholinesterase enzyme is 75-100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2= Poisoning if blood cholinesterase enzyme &lt;75%</td>
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### Table 2 Distribution of Risk Factors of Exposure with Pesticide Poisoning in farmers of Tolai Village

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Table 2 Distribution of Risk Factors of Exposure with Pesticide Poisoning in farmers of Tolai Village

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<td>%</td>
<td>n</td>
<td>%</td>
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<td>30.0</td>
<td>14</td>
<td>70.0</td>
</tr>
<tr>
<td>Dosage</td>
<td></td>
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<tr>
<td>Appropriate</td>
<td>56</td>
<td>88.9</td>
<td>7</td>
<td>11.1</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>20</td>
<td>60.6</td>
<td>13</td>
<td>39.4</td>
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<tr>
<td>Spraying position</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>28</td>
<td>76.7</td>
<td>9</td>
<td>24.3</td>
</tr>
<tr>
<td>Not good</td>
<td>48</td>
<td>81.4</td>
<td>11</td>
<td>18.6</td>
</tr>
<tr>
<td>Protective Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>9</td>
<td>69.2</td>
<td>4</td>
<td>30.8</td>
</tr>
<tr>
<td>Incomplete</td>
<td>67</td>
<td>80.7</td>
<td>16</td>
<td>19.3</td>
</tr>
</tbody>
</table>

Table 3 Risk Factors of Exposure with Pesticide Poisoning in farmers of Tolai Village

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pesticide Poisoning</th>
<th></th>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Poor</td>
<td>20</td>
<td>20.8</td>
<td>20</td>
<td>20.8</td>
</tr>
</tbody>
</table>
Conclusion

Blood cholinesterase examination showed that as many as 20 farmers (20.8%) experienced pesticide poisoning in Tolai Village. Knowledge and behavior of farmers about the use of pesticides was still low such as the length of pesticide spraying > 3 hours (20.8%), dosage measurement > 0.5 / 10 liters of water (34.4%), the position of spraying was not in the direction of the wind (33.3%) and use of incomplete personal protective equipment (86.5%). There was a relationship between the length of spraying, dosage and position of spraying with pesticide poisoning on farmers in Tolai Village, Parigi Moutong Regency.

Ethical Clearance: Poltekkes Kemenkes Palu, City of Palu, Indonesia

Source of Funding: Poltekkes Kemenkes Palu

Conflict of Interest: None

References


Compliance in Maintaining Hand Cleaning on Health Care Workers in Neonatology Unit in Tertiary Referral Hospital Indonesia: The Usage of CCTV for Supervision

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¹Faculty of Medicine, Universitas Airlangga, Indonesia

Abstract

Background: Hand hygiene is an effort to overcome Healthcare-associated Infections especially in the neonatology unit but the implementation in various hospitals is still not in accordance with the standards.

Aim: The study is aimed to determine the health care workers compliance in maintaining hand cleaning monitored through CCTV as a media of supervision.

Method: An observational descriptive study was conducted with a cross sectional approach in the highest referral hospital in East Java Indonesia. All health care workers in the Neonatology Unit, who was on duty and recorded by CCTV, was involved in the research during the observation, both nurses, doctors, college students, health care workers, and cleaning services. Hand hygiene compliance was assessed using the WHO observation sheet.

Result: The study revealed that hand hygiene compliance on health care workers in the Neonatology Unit as a whole was 74.5%. Based on five moments for hand hygiene, 83.3% were obtained before contact with patients, 100% before taking aseptic action, 90% after risk of exposure to body fluids, 74.5% after contact with patients, and 42.2% after contact with the environment patient. Of the five indicators, one indicator did not meet the hospital’s target. Based on the profession category, the hand hygiene compliance was found 78.4% in nurses, 30% in doctors, 78% in college students, and 22.2% in others.

Conclusion: Hand hygiene compliance on health care workers are found to vary based on five moments for hand hygiene and professional categories of health care workers.

Keywords: Hand hygiene, health care workers, neonatology units, CCTV, referral hospital

Introduction

Nosocomial infection or currently referred to as Healthcare-Associated Infections (HAIs) is still a health problem in various countries in the world, including Indonesia. Hundreds of people around the world die from infections acquired when receiving health services. The neonatology unit is a place with a high risk of HAIs which is one of the main causes of death in neonates.

Prevention of the transmission of harmful germs needs to be done to reduce the incidence of HAIs. Hand hygiene is a simple action that can save many people if done at the right time and in the right way through five moments for hand hygiene. Hand hygiene is one of the efforts that must be applied in all health service facilities and carried out by all health care workers, as a sign of competence, professionalism and responsibility. Therefore, compliance with hand hygiene becomes a crucial part of health services in hospitals.

Strict hand hygiene compliance can reduce the risk of cross infection. The policy in developing countries regarding compliance monitoring is urgently needed for the application of basic infection prevention practices.
in health care arrangements.\textsuperscript{[5]} Periodic environmental supervision including health care workers who provide services can give advantage at avoiding irrational antibiotics usage.\textsuperscript{[6]} Long-term hand hygiene compliance can be done by direct monitoring and feedback on the results of monitoring.\textsuperscript{[7]}

Direct observation is still the “gold standard method” for assessing hand hygiene compliance.\textsuperscript{[8]} In India for example, in which technology for monitoring compliance may not be available, direct observation remains the main standard.\textsuperscript{[9]} However, camera-based systems or Continued Circuit Television (CCTV) can be used to monitor the health care workers hand hygiene compliance in accordance with five moments of hand hygiene. The process of observation is direct and continuous in order to avoid the occurrence of the Hawthorne effect, which is a person’s behavior that is different from usual, caused by feelings being observed in a study.\textsuperscript{[10]} CCTV monitoring is the most appropriate, reliable, and neutral method for observing hand hygiene compliance because observation is carried out directly and closed so as to hinder bias from the results of the study.\textsuperscript{[11]}

The hospital chosen is the highest referral hospital in East Java Indonesia with the Joint Commission International (JCI) accreditation standard which establishes hand hygiene compliance as one indicator of the health services quality.\textsuperscript{[12]} The Neonatology Unit has CCTV monitoring facilities that can be used to monitor health care workers hand hygiene compliance adequately. This study is henceforth aimed to examine the health care workers hand hygiene compliance monitored through CCTV as a media of supervision in The Neonatology Unit.

**Material and Method**

The present observational descriptive study with a cross sectional approach was carried out at the first level referral hospital in East Java Indonesia (Dr. Soetomo Hospital) for 5 months in 2017-2018. All health care workers working in the Neonatology Unit of Dr. Soetomo Hospital, namely the profession category of nurses, doctors, college students, health care workers, and cleaning services represented by officers who were on duty and recorded in CCTV videos when observations were made. The sampling technique used was accidental sampling.

Health care workers hand hygiene compliance was measured through 5 WHO moments, namely before touching patient, before aseptic procedures, after body fluid exposure/risk, after touching a patient and after touching patient surroundings. Data collection was carried out by observing hand hygiene using the WHO observation sheet through 3 (three) CCTVs installed. Observations were carried out in a closed manner by looking at CCTV videos in a one-hour special room so that a total duration of 7 hours was reached for 1 week. The research variables were the amount of hand hygiene opportunities considered as hand hygiene moments compared to hand hygiene attitude in accordance with the moments performed. The researcher was assisted by the research team in the observation to obtain objective data so that it was done repeatedly until the results of both observations had similarities. The obtained data was described descriptively.

**Result**

In the research location, the location of the sink and soap dish was quite strategic to do hand hygiene using handwash techniques also alcohol handrub was available on each storage cabinet next to the incubator and open baby box. The clerk had 660 hand hygiene opportunities during the observation. Nearly half of the opportunities for hand hygiene of 258 opportunities (39.1%) occurred in the moments before contact with patients, and a small percentage of opportunities were 11 opportunities (1.7%) occurred in the moments before taking aseptic action. Every profession had different opportunities and opportunities depending on work procedures and care that was done. Most opportunities with a total of 388 opportunities (58.8%) occurred in the nurse profession category, and a small percentage of opportunities were 9 opportunities (1.4%) occurred in other professions categories.

Health care workers hand hygiene compliance was described according to five moments and the type of profession presented in table 1. In table 1 it was noted before carrying out aseptic actions, the hand hygiene compliance was 100% while after contact with the patient’s environment as many as 42.2% compliance was obtained. According to the profession category, nurse compliance was considered as the largest percentage with the total amount of 78.4% while other professions such as cleaning services, and other health care workers had the lowest compliance of around 22.2%
Table 1. Health care workers hand hygiene compliance based on five moments of hand hygiene and profession category

<table>
<thead>
<tr>
<th>Category</th>
<th>Opportunities(n)</th>
<th>Attitude (n)</th>
<th>Compliance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Missed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five moments hand hygiene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before touching patients</td>
<td>258</td>
<td>215</td>
<td>43</td>
</tr>
<tr>
<td>Before aseptic procedures</td>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>After body fluid exposure/risk</td>
<td>50</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>After touching patients</td>
<td>239</td>
<td>178</td>
<td>61</td>
</tr>
<tr>
<td>After touching patients surroundings</td>
<td>102</td>
<td>43</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>660</td>
<td>492</td>
<td>168</td>
</tr>
<tr>
<td>Profession</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>388</td>
<td>304</td>
<td>84</td>
</tr>
<tr>
<td>Doctor</td>
<td>40</td>
<td>12</td>
<td>28</td>
</tr>
<tr>
<td>College student</td>
<td>223</td>
<td>174</td>
<td>49</td>
</tr>
<tr>
<td>Others</td>
<td>9</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>660</td>
<td>492</td>
<td>168</td>
</tr>
</tbody>
</table>

Table 2 described the hand hygiene compliance by profession based on on five moments. The result of the greatest hand hygiene compliance before contact with patients was found in college students with the numbers that were not far from nurses while doctors did handwashing more than half the chance (53.8%). Hand hygiene compliance before contact with patients had the greatest number of opportunities. The biggest percentage of adherence to hand washing before aseptic action was 100% for both college students and nurses.

Table 2. Hand hygiene compliance by profession based on five moments

<table>
<thead>
<tr>
<th>Category</th>
<th>Opportunities</th>
<th>Attitude</th>
<th>Compliance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Missed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before touching patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>157</td>
<td>132</td>
<td>25</td>
</tr>
<tr>
<td>Doctor</td>
<td>13</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>College student</td>
<td>88</td>
<td>76</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>215</td>
<td>43</td>
</tr>
<tr>
<td>Before aseptic procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>College students</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>After body fluid exposure/risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>31</td>
<td>29</td>
<td>2</td>
</tr>
<tr>
<td>College student</td>
<td>19</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>After contacting patients</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Discussion**

The number of opportunities obtained was sufficient to obtain adequate results. Assessment of hand hygiene compliance, needed a minimum of 200 hygiene opportunities occurred during the assessment period. In this study, the hand hygiene compliance in the neonatology unit is good category. There was one moment with results that had not reached the standard at the time after contact with the patient’s environment. The results obtained were not in accordance with the results of the research conducted in the short term given to the research obtained from the results of no more than 40% [1] Hand hygiene compliance was good if the percentage of hand hygiene reached ≥50%, while it was considered poor if the percentage hand hygiene <50%. [13] Whereas other sources of reference mentioned that the average compliance level in accordance with the recommended hand hygiene technique among healthcare workers was 78%, which was below the 90% benchmark for critical care fields. [9] Target for hand hygiene compliance in the health care institution was set to > 90%, in which regarded as a very high value, unachievable and unrealistic. [14] The decision of hand hygiene compliance target must be realistic and could be agreed upon, because it needed to be done long-term in improving hand hygiene itself. [3] There was no fixed target agreed internationally for ideal hand hygiene compliance, so that it was necessary to determine the target of each institution carried out as part of the assistance to improve the quality of the care unit. [15]

The factors that most caused healthcare workers to be disobedient in carrying out hand hygiene were limited time, large number of jobs must be done, lack of knowledge, skepticism about hand hygiene as a method of prevention, not strategic placement of sinks and soaps, and lack of motivation in improving hand hygiene compliance. [16] Other studies suggested that easy and adequate access, pre-survey orientation programs and training were not ensuring adequate compliance. Continuous training, performance feedback and verbal reminders would be needed to maintain compliance with hand hygiene. [9]

The ease of facilities was seen at the time of observation so as to support the achievement of good hand hygiene compliance. Most hand hygiene opportunities occurred on moments before contact with patients and after contact with patients. These two moments often occurred simultaneously, for example when a health worker completed an action from one patient, then took action on another patient. Hand hygiene opportunities at moment 1, 4, and 5 were the most likely to occur, which was about 80% of all opportunities for hand hygiene by healthcare workers. [17]

The compliance rate was based on five moments and the type of profession varies. Previous research found the different things. Some found that nurses dominated hand hygiene opportunities but there were also those who found professions and other health workers. [18] This happened because each hospital had different procedures and division of labor. In general, nurses had an important role in caring for patients in research. The variation in compliance with hand hygiene in each occupation was likely to be caused by constant nurse contact with patients so that the opportunity for hand hygiene that occurred to nurses was higher than other professions. [19] Healthcare workers who made a lot of contact with patients needed to have high hand hygiene compliance. [20]

Various policies needed to be developed related to hand hygiene compliance monitoring. Accuracy of
monitoring procedures and hand hygiene compliance was essential in order to protect patients and health care workers from infections related to health care. Training on the quality of observations and patient involvement in improving hand hygiene compliance monitoring needed to be considered.\footnote{21} In addition to general compliance indicators, procedures such as monitoring and recording compliance periodically, providing feedback to personnel regarding staff performance, and monitoring the volume of alcohol-based swabs (or detergents) used for hand washing or hand antisepsis) used per 1,000 patient-days. In addition, when an outbreak of infection occurred, it was necessary to assess the adequacy of hygiene of health care workers hands.\footnote{22} Installation of CCTV could be considered as an additional medium to monitor the implementation of hand hygiene.

The limitation in this study is that it can only assess hand hygiene compliance based on five moments of hand hygiene recommended by WHO, unable to assess hand hygiene techniques through CCTV, the use of video recordings from three different cameras, the need for several people in observation and repetition, and limited time research. So the future research may study hand hygiene techniques, and conduct the same research in the long term.

**Conclusion**

Hand hygiene compliance of healthcare workers was found to vary based on five moments of hand hygiene and professional categories of healthcare workers. Of the five moments, one moment does not meet the target, namely healthcare workers’ hand hygiene compliance after contact with the patient’s environment.

**Acknowledgments:** The author would like to express gratitude to all members of Faculty of Medicine, Universitas Airlangga, Indonesia.

**Ethical Clearance:** This research has gone through ethical testing in the Ethics Committe Dr. Soetomo Hospital Surabaya Indonesia with the ethical code 0021 / KEPK / II / 2018

**Conflict of Interest:** The authors declare that there is no conflict of interest

**Source of Funding:** This research was carried out by a team and funded independently

**References**


22. CDC. Guideline for Hand Hygiene in Health-Care Settings. 2002;
Study the Role of Green Silver Nanoparticle Against Aspergillus Niger in Adult Albino Male Rats

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Abstract

The current study was designed to show the role of green silver nanoparticle against toxicity Aspergillus niger. The study used 20 adult albino male rats that distributed randomly to four groups (each group consists 5 rats); control group administrated ad libidium, rats group A. niger, rats group administrated A. niger and treated with 50ug/kg AgNPs, rats group administrated A. niger and treated with 100ug/kg AgNPs. The results levels show significant of MDA high (P < 0.05) (malondialdehyde) and low significant in levels of glutathione (GSH), total antioxidant capacity and catalase compared with the control group. Histological, the sections that prepared from lungs of this group show hemorrhage, thickening walls of alveoli with fibrosis. While, after used rats group administrated A. niger and treated with 50mg/kg AgNPs with A. niger, the results showed non-significant changes (P < 0.05) in MDA, GSH, total antioxidant capacity, and catalase compared with the control group. It was concluded that AgNPs has been potential role against toxicity of Aspergillus niger in adult male albino rats.

Keywords: Green silver nanoparticle; Aspergillus niger; MDA (malondialdehyde); glutathione (GSH); catalase.

Introduction

The silver nanoparticle was used in various utilization in industry, medicines due to its characterized essentially antifungal, antibacterial, larvicidal and anti-parasitic(1). Chemically, physically, and biologically techics have been developed to synthesis nanoparticles but chemically, physically methods are included in the production of toxic byproducts which are risky in addition the methods are very expensive (2-3). The physical methods require a large amount of energy to maintain high pressure and heat needed for the reaction (4). Thus the chemical and physical methods have their own limitations; these are thought about expensive and unsuitable for continuous ecosystem (5). The exceptional characteristics of Aspergillus niger have made them applicable in various fields like drug delivery biomedical, agricultural water treatment (6,7,8,9). Aspergillus niger is applied in inks, electronic devises, adhesives, pastes due to high force (10). So, the purpose of this study is to show the function of green silver nanoparticle against toxicity Aspergillus niger.

Materials & Method

Animal model

Twenty adult male rats were used in the present study, (wt 200-250 mg with age3-5 month) obtained from Technical college/ North Technical University, and kept on standard pellet diet and water.

Prepared of A. niger suspension

Spore concentration of different spore suspensions was adjusted by using hemocytometer, according to the classical procedure. Fungal pellets were resuspended in saline solution and were adjusted to 10^5 - 10^7 spores/ml using hemocytometer to prepare working solution from microorganism spores (11).

Green tea (Camellia sinensis) extract

The leaf powder (25 gm) were extracted, by mixed with 250 ml pure water, using the soxhlet material and H_2O bath source of heating (70°C). The extract was then

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evaporated at 70°C using a rotary evaporating, then crude extra of Gt was storage until use (12).

**Silver nanoparticles synthesis**

18 ml of silver nitrate (2mM) solution was prepared. 2 ml of green tea extract was added to the silver nitrate solution. AgNO3 ions bioreduction happen within 5h. green tea extract is the yellow color which converted to the brown color that means the formation of AgNPs (13).

**Experimental design**

20 albino male rats are used and distributed randomly as follow (each group consists of five rats):

- Control group received standard pellet diet for two weeks and then killed.
- Rats group were injected (intraperitoneal) with $10^5$ A. niger spores and killed after infection.
- Rats group were injected (intraperitoneal) with $10^5$ A. niger spores and treated with 50ug/kg AgNPs for two weeks
- Rats group were injected (intraperitoneal) with $10^5$ A. niger spores and treated with 100ug/kg AgNPs for two weeks

**Prepare of blood solution**

Blood samples collecting by cardiac puncher, under anesthesia, then put in test tubes. Then, tubes were centrifugation for 10 min to obtain serum that stored by deep freezing until used.

**Serological tests**

MDA (malondialdehyde) was measured, according to colorimetric reaction with thiobarbituric, acid (TBA) using, spectrophotometer (14). GSH level estimated by mixed 2.3 ml buffer with 0.2ml of the sample, and then added 0.5ml of DTNB. The mixture was analyzed by spectrophotometer (15).

**Histological study**

At the finishing of the experiment, rats were anesthetized with ketamine/xylocaine, the lungs were excised then fixed by using formalin 10% for 48 hours. After that, the lungs were dehydrated in ascending series of ethanol (50, 60, 70, 80, 90, 100, 100), cleared in xylene and embedded in paraffin wax, sections (5 µm) were taken by a rotary microtome. These sections were dye by using Harris hematoxylin and eosin (Luna,1968). Part of the lungs was homogenized to serological tests (16).

**Statistical study**

The Data were analyzed using a statistical Minitab program. A statistical difference between the means of the experimental groups was test using one-way analysis of variance (ANOVA).

**Results**

**Serological tests**

The levels of MDA (2.82 ± 0.28), GSH (0.329 ± 0.052), catalase (0.64 ± 0.07) and TAC (0.552 ± 0.039) in rats injected with A. niger spores show high significant increased (P < 0.05) compared with control rats (1.63 ± 0.07; 0.529 ± 0.052; 1.1 ± 0.04 and 0.732 ± 0.052 respectively). The levels of MDA (2.15 ± 0.17), GSH (0.453 ± 0.032), catalase (0.92 ± 0.03) and TAC (0.611 ± 0.081) in rats injected A. niger spores and treated with 50ug/kg AgNPs show significant increased (P < 0.05) compared with control group rats. While, the levels of MDA (1.69 ± 0.04), GSH (0.541 ± 0.064), catalase (1.03 ± 0.01) and TAC (0.728 ± 0.06) in rats injected A. niger spores and treated with 100ug/kg AgNPs show significant increased (P < 0.05) compared with control group rats as shown in chart (1).

**Histological study**

The sections that prepared from lungs of normal rats show the normal structure of alveolar sacs and alveoli (fig 1). Where, in rats that injected with A. niger spores show a thickening wall of blood vessels and alveoli with congestion and infiltration of lymphocytes with fibrosis (fig 2). After treatment, the sections prepared from lungs of 50ug/kg (fig 3) and 100ug/kg (fig 4) AgNPs closed to a normal structure.
Chart (1): The levels of MDA, GSH, CAT and TAC

<table>
<thead>
<tr>
<th></th>
<th>MDA</th>
<th>GSH</th>
<th>CAT</th>
<th>TAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>1.63</td>
<td>0.529</td>
<td>1.1</td>
<td>0.732</td>
</tr>
<tr>
<td>G2</td>
<td>2.82</td>
<td>0.329</td>
<td>0.64</td>
<td>0.552</td>
</tr>
<tr>
<td>G3</td>
<td>2.15</td>
<td>0.453</td>
<td>0.92</td>
<td>0.611</td>
</tr>
<tr>
<td>G4</td>
<td>1.69</td>
<td>0.541</td>
<td>1.03</td>
<td>0.728</td>
</tr>
</tbody>
</table>

Figure (1): lungs of control group show normal structure of alveolar sacs (AS) and alveoli (AL) H&E 400X.
Figure (2): lungs of infected group show thickening wall (TW) of blood vessels and alveoli with congestion (CON), lymphocytes infiltration (IL) and fibrosis (F) H&E 400X.

Figure (4): lungs of infected and 50μg/kg AgNPs group show of alveolar sacs (AS) and alveoli (AL) H&E 400X.
Discussion

The results show that *A. niger* lead to increase in the levels of MDA and decrease GSH, CAT and TAC levels with different lesions in sections of lungs, this findings similar to Shafiq and Akbal (2010) who reported various histological changes found in tissues of lung included necrosis in alveoli with abuses, formation and inflammatory cells infiltration in adding hemorrhage with thickness in lung alveolar sac wall and brancheolis (17). The results of the present study show the antimicrobial activity of AgNPs. Where, The antimicrobial, effect of metal nanoparticles was referred to their mini size and high surface to volume rate, that permits them to relate closely with microbial (bacteria, fungi) membranes and is not merely as a result of the release of metal ions, in solving (18). Mahmood (2012) referred that the silver nanoparticles possess antimicrobial, activity. where, suggest that The method of inhibiting the activity of silver ions on, microorganism, shows that upon Ag+ treatment, DNA loses, its replication ability and expression, of ribosomal subunit proteins, as well as other cellular proteins and enzymes essential to Adenosine TriPhosphate production, becomes inactivated (19). In another study, The biosynthesized silver, nanoparticles showed excellent antimicrobial, activity. The antimicrobial activity concluded that the synthesized, nanoparticle more, effective for gram-positive bacteria. The results of synthesized nanoparticle lead towards clinical use as an antimicrobial agent (20).

Conflict of Interest: There is no conflict of interest among the authors.

Funding: Self

Ethical Clearance: This study is ethically approved by the Institutional Ethical Committee.

Reference


22. Chart (1): The levels of MDA, GSH, CAT and TAC

23. Chart (1): The results show that A. niger lead to increase the levels of MDA and decrease GSH, CAT and TAC levels with different lesions in sections of lungs.
Effects of Artificial Aging on Some Properties of Room-Temperature-Vulcanized Maxillofacial Silicone Elastomer Modified by Yttrium Oxide Nanoparticles

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¹MSc. Student, ²Assistant Professor, Dept. of Prosthodontics, College of Dentistry, University of Baghdad, Baghdad-Babulmoadam, Iraq

Abstract

Background: The daily usage of maxillofacial prostheses causes them to mechanically deteriorate with time. This study was aimed to evaluate the reinforcement of VST50F maxillofacial silicone by using yttrium oxide (Y₂O₃) nanoparticles (NPs) to resist aging and mechanical deterioration.

Materials and Method: Y₂O₃ NPs (30–45nm) were loaded into VST50F maxillofacial silicone in two weight percentages (1 and 1.5 wt%), which were predetermined in a pilot study as the best rates for improving tear strength with minimum increase in hardness values. A total of 120 specimens were prepared and divided into the control and experimental groups (with 1 and 1.5 wt% Y₂O₃ addition). Each group included 40 specimens, 10 specimens for each parameter tested (i.e., tear strength, surface roughness, hardness, tensile strength and elongation percentage). Specimens were artificially aged in a weathering chamber for 150 h and then tested. Data were analyzed by ANOVA and Tukey’s honestly significant difference (HSD). Statistical significance was set to \( P \leq 0.05 \). Scanning electron microscopy (SEM) and Fourier transform infrared (FTIR) spectroscopy were also conducted.

Results and Discussion: SEM results showed that Y₂O₃ NPs were distributed well within the silicon matrix. FTIR results indicated that the NPs were physically dispersed within VST50F silicone without chemical interaction. After 150 h of accelerated artificial aging, adding Y₂O₃ NPs significantly increased the tear strength, hardness, surface roughness, and elongation percentage. Tensile strength increased non significantly.

Conclusion: Adding Y₂O₃ NPs as fillers improved the mechanical properties of artificially aged maxillofacial silicone elastomer.

Keywords: maxillofacial silicone, Y₂O₃, nanoparticles, fillers, artificial aging.

Introduction

Construction of a maxillofacial prosthesis to replace missing facial parts caused by injuries, tumors, or congenital anomalies may be rendered necessary to restore esthetics and function (¹). Surgical rehabilitation may have to be excluded because of the size, site, or cost of surgery (²). Silicone elastomers had become the most widely used replacement material because of their biocompatibility, esthetic outcome, easy pigmentation, and easy application (³). Replacement materials should possess adequate mechanical properties, such as high tear and tensile strengths and hardness close to that of the replacement site, and maintain these properties for the adequate lifetime of prosthesis service (⁴). Silicone elastomer prostheses have short service life because of aging and deterioration of mechanical properties (²). Multiple studies have been conducted to improve silicone

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properties and protect resulting materials against aging such as nanofiller addition. The mechanical properties of A-2186 maxillofacial silicone were improved by adding silanated nano-SiO$_2$ (6).

Different nanoparticles (NPs; e.g., titanium dioxide, fumed silica, and silanated silica) have been added to A-2000 and A-2006 silicones and improved certain properties (6). Wang et al. (2014) proved the antiaging effect of TiO$_2$ on MDX4-4210 silicone tensile strength against thermal and UV aging (7).

**Materials and Method**

VST50F room-temperature-vulcanized maxillofacial silicone elastomer (Factor II, Inc., Lakeside, AZ, USA) was incorporated with Y$_2$O$_3$ nanopowder (US Research Nanomaterials, Inc., USA) and placed in a weathering chamber of an accelerated weathering tester (Model QUV/spray, Q-Lab corp. USA) for 150 h. Silicone with and without Y$_2$O$_3$ NPs addition were mechanically tested and compared.

**Pilot study:** Y$_2$O$_3$ nanopowder was added in two weight percentages, namely 1 and 1.5 wt%, to improve the tear strength with minimal effect on the hardness of the silicone elastomer.

**Study grouping:** A total of 120 specimens were prepared and divided into the control group (Group A; 0% nano-Y$_2$O$_3$ addition) and experimental groups (Group B, 1% Y$_2$O$_3$ addition; and Group C, 1.5% Y$_2$O$_3$ addition). Each group included four subgroups according to the parameters to be tested, namely, tear strength, surface roughness, shore A hardness, tensile strength and elongation percentage. All specimens were artificially aged for 150 h in the accelerated weathering chamber.

**Mold making:** AutoCAD was used to design the dimensions of specimens. A computer numerical control machine (JL-1612, Jinan Link Manufacture and Trading Co., Ltd., China) was used to form the mold matrix for material pouring (8).

**Mixing base, catalyst, and Y$_2$O$_3$ NPs:** A digital electronic balance with 0.000 accuracy (China) was used for measurement. The silicone base was measured initially and then added with the accelerator at 10:1 ratio (according to the manufacturer’s instructions). The materials were mixed with a vacuum mixer (Multivac 3, Degussa, Germany) at 360 rpm for 5 min under −10 bar vacuum pressure (9). In case of NP addition, Y$_2$O$_3$ nanopowder was measured first followed by the silicone base (9). The two materials were mixed for 10 min to form the modified base, in which the first 3 min was without vacuum suction to preserve the nanopowder. Vacuum pressure of −10 bar was applied in the following 7 min to obtain a properly mixed, bubble-free mixture (10). The catalyst was added at 10:1 ratio (modified base to catalyst) and mixed for 5 min with vacuum suction of −10 bar. All mixing steps were performed at a relative humidity (RH) of 50% ± 10% and temperature of 23 °C ± 2 °C (11).

**Pouring the material into the mold:** The mixture was poured in the matrix portion of the mold, and the cover was applied and locked with four screws, four nuts, and four G-clamps with 1 kg of load until complete curing (9). Mixture was poured under standard conditions (RH of 50% ± 10% and temperature of 23 °C ± 2 °C) (12,13).

**Specimen storage, retrieval, and finishing:** A storage box was used to preserve the temperature and humidity at standard levels (20 °C–25 °C, 50%–60% RH) and provide light protection (14). After polymerization and complete vulcanization, the specimens were cleaned from flashes and checked to be free from bubbles. Defects with defined borders were discarded (5).

**Accelerated artificial aging of specimens:** The specimens were artificially aged for 150 h in a Weather-Ometer device (QUV) according to ASTM G-154/7(15) with each aging cycle at 12 h. The light cycle of 8 h was 340 nm, irradiance of 1.55 W/m$^2$ at 60 °C ± 3 °C. The following dark cycle of 4 h was at 340 nm, irradiance of 1.55 W/m$^2$, and water spray for 15 min for thermal shock induction, followed by 3.45 h for condensation at 50 °C ± 3 °C. Each 150 h of artificial aging was equal to approximately 4.7 months of clinical use (real-life aging) (16,17).

**Mechanical testing procedures:**

A) **Tear strength:** Type C specimens according to ASTM D624 (13) were used and tested by a universal testing machine (Laryee Technology Co., Ltd., China). The specimens were stretched at 500 mm/min until the apex completely ruptured. Tear strength was calculated as follows: Tear strength = $f/d$, where $f$ is the highest recorded force for complete rupturing (kN), and $d$ is the specimen average thickness (m).
B) Hardness: Specimens with dimensions of 25 mm (length) × 25 mm (width) × 6 mm (thickness) were used according to ISO 7619-1 (2010) and tested with a Shore A hardness digital tester (HT-6510A, China) characterized by1.25 mm diameter dull indenter. Hardness is the mean of five different measurements at points separated by 6 mm distance.

C) Surface roughness: Specimens similar to those used to test hardness were tested by a digital surface roughness tester (SRT-6200S, China). The diamond probe moved on the specimen surface and recorded the roughness value at micrometer scale.

D) Tensile strength and elongation percentage: Type 2 specimens according to ISO 37 (dumbbell shaped specimens) were prepared and tested by a universal testing machine at 500 mm/min until the complete rupturing at the thin portion. Tensile strength was calculated as follows: Tensile strength = \( F/A \), where \( F \) is the highest recorded force to rupture the specimen at the thin portion (N), and \( A \) is the specimen cross-sectional area (width × thickness) (mm\(^2\)). Elongation percentage was calculated using the specimen length before and after rupturing. This parameter was calculated as follows: Elongation percentage = \( (L_o - L_f)/L_o \times 100 \), where \( L_o \) is the original length, and \( L_f \) is the length after rupturing.

**Additional tests:** A scanning electron microscope (SEM) (Inspect S50, FEI Company, Netherland) and Fourier transform infrared (FTIR) spectroscope (Tensor 27, Bruker, Germany) were used to check the dispersion of the NPs and whether the NPs reacted chemically with the silicone elastomer.

**Statistical analysis:** bar charts were plotted and ANOVA and post-hoc Tukey’s HSD tests were performed using the SPSS software with significance level set to \( P \leq 0.05 \).

**Findings**

**SEM and FTIR examinations:** SEM images indicated that the Y\(_2\)O\(_3\) NPs were distributed well within the silicon matrix before and after aging with no sign of reagglomeration caused by aging (Figures 1A and 1B). The FTIR spectra of VST50F maxillofacial silicone modified with Y\(_2\)O\(_3\) nanopowder before and after aging indicated the absence of degradation or chemical change caused by aging.

![Figure 1: Scanning electron microscope images show the good dispersion of fillers with no reagglomeration caused by aging. (A) Before aging (10 µm magnification). (B) After aging (10 µm magnification).](image)

**Tear strength:** Groups B and C showed significantly increased mean values of tear strength compared with group A \( (P < 0.05) \) with non significant difference between them \( (P > 0.05; \text{ Table 1}) \).
Table 1: Descriptive statistics, one-way ANOVA and Tukey’s HSD of tear strength.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>±SD</th>
<th>F</th>
<th>P value</th>
<th>Groups</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>22.7</td>
<td>26.0</td>
<td>23.93</td>
<td>1.079</td>
<td>44.739</td>
<td>.000 [S]</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>25.6</td>
<td>28.6</td>
<td>26.89</td>
<td>1.152</td>
<td></td>
<td></td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>C</td>
<td>26.8</td>
<td>29.0</td>
<td>27.98</td>
<td>.673</td>
<td></td>
<td></td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

**Hardness:** Groups B and C showed significantly increased mean values for hardness compared with group A and with significant difference between them ($P < 0.05$; Table 2).

Table 2: Descriptive statistics, one-way ANOVA and Tukey’s HSD of hardness.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>±SD</th>
<th>F</th>
<th>P value</th>
<th>Groups</th>
<th>P value</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>26.8</td>
<td>28</td>
<td>27.26</td>
<td>.403</td>
<td>256.035</td>
<td>.000 [S]</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>30.4</td>
<td>32</td>
<td>31.09</td>
<td>.601</td>
<td></td>
<td></td>
<td>A</td>
<td>C</td>
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<tr>
<td>C</td>
<td>31.5</td>
<td>33</td>
<td>32.31</td>
<td>.538</td>
<td></td>
<td></td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

**Surface roughness:** Groups B and C showed significantly increased mean values of surface roughness compared with group A ($P < 0.05$) with non significant difference between them ($P > 0.05$; Table 3).

Table 3: Descriptive statistics, one-way ANOVA and Tukey’s HSD of surface roughness.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>P value</th>
<th>Groups</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>.529</td>
<td>.750</td>
<td>.648</td>
<td>.066</td>
<td></td>
<td></td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>C</td>
<td>.529</td>
<td>.823</td>
<td>.665</td>
<td>.093</td>
<td></td>
<td></td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

**Tensile strength:** Groups B and C showed non significantly increased mean values of tensile strength compared with group A with non significant difference between them ($P > 0.05$; Table 4).

Table 4: Descriptive statistics and one-way ANOVA of tensile strength.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3.640</td>
<td>5.950</td>
<td>4.887</td>
<td>.744</td>
<td>3.753</td>
<td>0.056 [NS]</td>
</tr>
<tr>
<td>B</td>
<td>4.640</td>
<td>6.750</td>
<td>5.588</td>
<td>.669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>4.870</td>
<td>6.650</td>
<td>5.650</td>
<td>.659</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Elongation percentage:** Groups B and C showed significantly increased mean values of elongation percentage compared with group A ($P < 0.05$) with non significant difference between them ($P > 0.05$; Table 5).
Table 5: Descriptive statistics, one-way ANOVA and Tukey’s HSD of elongation percentage.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>P value</th>
<th>Groups</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>469%</td>
<td>569%</td>
<td>515.9%</td>
<td>.333</td>
<td>5.104</td>
<td>0.013</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>497%</td>
<td>642%</td>
<td>569%</td>
<td>.497</td>
<td></td>
<td></td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>C</td>
<td>501%</td>
<td>665%</td>
<td>574%</td>
<td>.502</td>
<td></td>
<td></td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

**Discussion**

Maxillofacial prostheses require replacement every 6–12 months\(^{22}\) because of impairment and deterioration in properties. In this study, maxillofacial silicone reinforced with \(Y_2O_3\) NPs was artificially aged for 150 h to evaluate the antiaging effect of such reinforcement. Incorporating \(Y_2O_3\) NPs significantly increased the tear strength probably due to the entrapment of the NPs within the polymer matrix. Thus, 3D physical networks were formed and obstructed the movements of the polymer segment, thereby increasing the overall density and strength\(^{23}\). The hardness was significantly increased after filler incorporation probably because of the increased rigidity resulting from the enhanced overall stiffness as the filler occupied the spaces between polymeric chains\(^{24}\). This increase was proportional to the increase in filler weight percentage as observed in the significant difference between groups B and C. The acceptable clinical range of hardness is 25–35\(^{7}\), and this value was not surpassed by filler addition nor aging for 150 h. Filler incorporation significantly increased surface roughness, which can be related to the aging-induced changes on the material surface, such as microcracks or fissures associated with the NPs random dispersion on the material surface causing increased surface roughness\(^{25,26}\). Tensile strength was not significantly increased after NPs addition, which may be attributed to the presence of the NPs that acted as obstacles preventing the sliding of polymer chains over each other. Thus, higher tensile forces were required\(^{27}\). The elongation percentage was significantly increased after NP incorporation probably because of the cross-linking action of the NPs. This action formed powerful bonds between the hydroxyl groups and polydimethylsiloxane chains by hydrogen bonds to protect these chains from breaking under higher tension\(^{9,28}\).

Silicone elastomers modified with NPs dispersed in their matrix are characterized by network structures and increased cross-sectional area. Thus, these materials are more resistant to the effect of aging processes, such as photo-oxidation or free radical formations\(^{29}\).

**Conclusion:** After 150 h of artificial aging, adding \(Y_2O_3\) NPs to VST50F maxillofacial silicone significantly increased the hardness (within the acceptable range), surface roughness, and elongation percentage and slightly increased the tensile strength.

**Conflict of Interest:** We hereby declare no conflict of interest.

**Source of Funding:** Entirely self-funded.

**Ethical Clearance:** In vitro study.

**References**


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Hyperlipidaemia in Hypertensive Patients in Kirkuk City

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Abstract

Hyperlipidemia and hypertension are important risk factors for atherosclerosis and specially ischemic heart disease, so this study is conducted to assay the association of hyperlipidemia in hypertensive patients in Kirkuk city in Iraq by collecting 150 hypertensive patients and 100 control participants, from Azadi teaching hospital in Kirkuk city in the period between: 01/01/2016 to 01/01/2018, lipid profile is done for all the participants, BMI and waist circumference are calculated also for all the participants and the findings have revealed significant association between hyperlipidemia and hypertension.

Keywords: hyperlidaemia, hypertension, BMI, WC

Introduction

Blood pressure normally rises with age, but when it become higher than the normal average for a matched age and sex diagnosis of hypertension ensues. This level is about 140/90 for those less than 80 years old and 150/90 for 80 years old and older. Hypertension is mostly asymptomatic problem and it is diagnosed by clinical exam. Most of cases are due to unknown causes, which is called essential hypertension (90-95%), with a 5-10% of cases having underlying causes, like Conn’s syndrome. Cushing disease, glomerulonephritis, in these conditions it is called secondary hypertension. (1)

Early diagnosis and proper treatment of hypertension is so important as far as is can cause serious complications in multiple systems as cardiovascular, central nervous system and it is a common cause of chronic kidney disease. So the aim of the treatment of hypertension is normalize the blood pressure level (<120/80) and prevent the different complications. (2)

Hyperlipidemia, which means both high LDL and TG and altered ratio of total cholesterol level to HDL, is usually seen in patients with increased blood pressure (BP) levels, and it is considered to be the leading cause of the atherosclerosis which affect the different parts of the cardiovascular system. (1,2,3)

Lipids are normally present in the serum in different forms, as: cholesterol, triglyceride & lipoprotein. These different forms of the serum lipids are important for normal physiology and it is involved in the cell wall synthesis, but any abnormality especially in serum cholesterol can cause serious complications in the cardiovascular system. (3)

Serum cholesterol is independent risk factor for cardiovascular diseases as it is the leading cause for atherosclerosis which affects the arteries, it is presented in three different separate cholesterol fractions with different prognostic significance: low-density lipoprotein (LDL), very-low-density lipoprotein (VLDL) and high-density lipoprotein cholesterol (HDL). LDL is atherogenic and high levels can predispose for atherosclerosis, while HDL is protective against atherosclerosis and low serum HDL is independent risk factor for cardiovascular diseases. (4)

Total cholesterol-to-HDL ratio best measure for predicting cardiovascular risk as it can cause atherosclerosis, which leads to thickening and narrowing of the arteries and in turn this cause predispose to ischemic heart diseases specially when there is other risk factors, like: hypertension, diabetes mellitus and smoking. (4)

Hyperlipidemia together with the above risk factors can lead to the well known cause of morbidity and mortality, atherosclerosis, which can affect any artery, but specially the coronary arteries, and causes the ischemic heart diseases in different forms. (5)
Obesity is a major world epidemic now and it is well known risk factor for high triglyceride, LDL, impaired glucose tolerance and hypertension, in which in turn can lead to atherosclerosis and serious cardiovascular complications. BMI is used to assess the degree of obesity and waist circumference (WC) to assess central obesity.(6)

**Material and Method**

This is a cross sectional study in which 250 participants are involved, the hypertensive patients were 250 and 100 participants were control with normal blood pressure, all of them are collected from Azadi teaching hospital at Kirkuk city for routine check in the period between: 01/01/2016 to 01/01/2018. All the participants are resident at Kirkuk city, aged: 30-70 years old, selected randomly from the outpatient clinic. All the patients included in the study were taking lipid lowering drugs nor taking anti-hypertensive drugs and were not complaining from renal, cardiac or hepatic complications.

After taking written informed consent, face-to-face interviews was used for data collection, anthropometric measurements, clinical examinations, and blood sample for serum lipid profile by trained research assistants.

Body mass index (BMI) is an important parameter so it is calculated for all the participants by measuring weight in kilograms, divided by height in meters squared (kg/m²), also waist circumference (WC) is used as a parameter in this study and it is measured from midway between the lowest rib and the iliac crest using a Gullick II tape with the participants in the standing position and at the end of expiration.

Blood pressure was measured for the participants using mercury sphygmomanometer by a physician two measurements are taken for the participants with 5 minutes interval in between after the patient had rest for 10 minutes. Hypertension was defined as an average SBP ≥140 mmHg and DBP ≥90 mmHg without antihypertensive medication.

5 mL of venous blood is taken from all the participants after an overnight fasting and the serum is used for assessment of the lipid profile (Total cholesterol TC, low density lipoprotein LDL, high density lipoprotein HDL, triglyceride TG & very low density lipoprotein VLDL) at the Azady hospital laboratory. Hyperlipidemia is assessed as following: Cholesterol in Adults (Adult Treatment Panel III): Total cholesterol (mg/dl) <200= desirable, 200–239= borderline high, ≥240= very high; LDL cholesterol (mg/dl) <100= optimal, 100–129= near optimal/above optimal, 130–159=borderline high, 160–189= high, ≥190= very high; triglyceride (mg/dl) <150= normal (goal), 150–199= borderline high, 200–499= high, ≥500=very high; HDL cholesterol (mg/dl) <40=low, ≥60= high.

**Statistics and data analysis:**

Descriptive statistics was used to present the demographic characteristics of the study participants. Continuous variables were presented as mean ± standard deviation (SD) and were compared using independent group Student’s t-tests. Analysing the relationship between hypertensive patients and the the normal control is done by using binary logistic regression analysis after adjusting for, BMI,age, sex, and BP. A P-value <0.05 was considered statistically significant.

**Results**

Data from 250 participants in this study is analyzed, and the result as showed in table 1 was: mean age ± SD 43.23 ± 4.1, mean WC ± SD : 90.21± 4.3 and it was higher in female than male, BMI ± SD: 26.87 ± 3.90, higher in female than male, SBP and DBP (mmHg) ± SD: 147.94± 8.66 and 95.64± 7.64 respectively, Total cholesterol ± SD: 245.31±4.78, Triglyceride ± SD: 202.83±7.22, LDL: 137.1± 6.96, HDL ±SD: 35.92± 3.17. BMI and WC were high in female than male, while total cholesterol, LDL and HDL were higher in male than female, all findings were statistically significant (P<0.05).

Table 2 showed that the mean age of the hypertensive and normotensive participants was 45.12±5.1 and 38.4±3.7 respectively. WC was higher in hypertensive than normotensive: 93.31± 6.96 and 90.18±4.89. BMI was higher in hypertensive than normotensive: 27.1±4.54 and 25.22±3.88.

Mean SBP of the hypertensive and normotensive participants was: 150.64±7.87 and 117.21±8.53 mmHg respectively and DBP was 99.91±7.65 and 78.32±6.14.

Total serum cholesterol was higher in hypertensive than normotensive participants: 254.66±4.42 and 192.81±7.49, LDL: 162.1±8.21 and 102.41±7.76,
Triglyceride: 212.54±6.77 and 148±9.97 respectively. HDL was lower in hypertensive than the normotensive participants: 36.29±3.88 and 40.33±4.76. All these findings in table 2 was statistically significant with p value < 0.05.

**Table 1: Characteristics of the participants**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Total (n=250) mean (SD)</th>
<th>Ranges</th>
<th>Male (n=150) mean (SD)</th>
<th>Female (n=100) mean (SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>43.23(4.1)</td>
<td>(34-50)</td>
<td>44.34(4.2)</td>
<td>42.53(5.47)</td>
<td>0.34</td>
</tr>
<tr>
<td>WC(cm)</td>
<td>90.21(4.3)</td>
<td>(70-120)</td>
<td>90.6(4.65)</td>
<td>94.2(5.6)</td>
<td>0.021</td>
</tr>
<tr>
<td>BMI</td>
<td>26.87(3.90)</td>
<td>(24-33)</td>
<td>29.9(5.6)</td>
<td>27.42(2.5)</td>
<td>0.013</td>
</tr>
<tr>
<td>SBP(mmHg)</td>
<td>147.94(8.66)</td>
<td>(105-162)</td>
<td>142.12(10.54)</td>
<td>138.43(11.39)</td>
<td>0.032</td>
</tr>
<tr>
<td>DBP(mmHg)</td>
<td>95.64(7.64)</td>
<td>(78-115)</td>
<td>94.54(7.63)</td>
<td>98.8(9.11)</td>
<td>0.01</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>245.31(4.78)</td>
<td>(195-267)</td>
<td>256.72(5.91)</td>
<td>226.8(4.14)</td>
<td>0.021</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>202.83(7.22)</td>
<td>(140-230)</td>
<td>236.11(6.56)</td>
<td>184.41(5.98)</td>
<td>0.001</td>
</tr>
<tr>
<td>LDL</td>
<td>137.1(6.96)</td>
<td>(90-167)</td>
<td>140.28(6.45)</td>
<td>122.49(2.56)</td>
<td>0.001</td>
</tr>
<tr>
<td>HDL</td>
<td>35.92(3.17)</td>
<td>(30-43)</td>
<td>33.62(5.42)</td>
<td>38.31(3.44)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Abbreviations: SD, standard deviation; BMI, body mass index; WC, waist circumference. SBP, systolic blood pressure. DBP, diastolic blood pressure; HDL, high density lipoprotein; LDL, low density lipoprotein;

**Table 2: Anthropometric and biochemical characteristics of participants**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Total (n=250) mean (SD)</th>
<th>Ranges</th>
<th>Male (n=150) mean (SD)</th>
<th>Female (n=100) mean (SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>43.23(4.1)</td>
<td>(34-50)</td>
<td>44.34(4.2)</td>
<td>42.53(5.47)</td>
<td>0.34</td>
</tr>
<tr>
<td>WC(cm)</td>
<td>90.21(4.3)</td>
<td>(70-120)</td>
<td>90.6(4.65)</td>
<td>94.2(5.6)</td>
<td>0.021</td>
</tr>
<tr>
<td>BMI</td>
<td>26.87(3.90)</td>
<td>(24-33)</td>
<td>29.9(5.6)</td>
<td>27.42(2.5)</td>
<td>0.013</td>
</tr>
<tr>
<td>SBP(mmHg)</td>
<td>147.94(8.66)</td>
<td>(105-162)</td>
<td>142.12(10.54)</td>
<td>138.43(11.39)</td>
<td>0.032</td>
</tr>
<tr>
<td>DBP(mmHg)</td>
<td>95.64(7.64)</td>
<td>(78-115)</td>
<td>94.54(7.63)</td>
<td>98.8(9.11)</td>
<td>0.01</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>245.31(4.78)</td>
<td>(195-267)</td>
<td>256.72(5.91)</td>
<td>226.8(4.14)</td>
<td>0.021</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>202.83(7.22)</td>
<td>(140-230)</td>
<td>236.11(6.56)</td>
<td>184.41(5.98)</td>
<td>0.001</td>
</tr>
<tr>
<td>LDL</td>
<td>137.1(6.96)</td>
<td>(90-167)</td>
<td>140.28(6.45)</td>
<td>122.49(2.56)</td>
<td>0.001</td>
</tr>
<tr>
<td>HDL</td>
<td>35.92(3.17)</td>
<td>(30-43)</td>
<td>33.62(5.42)</td>
<td>38.31(3.44)</td>
<td>0.001</td>
</tr>
</tbody>
</table>
**Discussion**

Hypertension is one of the commonest diseases globally and important risk factor for serious disabling medical conditions like: ischemic heart diseases (IHD), stroke and chronic kidney disease. Many studies showed relationship between hypertensive patients had other co-morbid conditions like: obesity and hyperlipidemia, in which can exacerbate the risk of IHD and stroke. This study has analyzed the relationship between hypertension and BMI, WC, and hyperlipidemia. The study showed that the mean BMI, WC, serum: TC, TG and LDL were higher in hypertensive compared to normotensive. HDL was lower in hypertensive participants compared normotensive. These relationships were statistically significant.\(^{(5,6)}\)

Scale study in Mexico revealed that TC, LDL and TG are higher in hypertensive participants and HDL is lower in hypertensive participants compared to normotensive. European study conducted to assess LDL, triglyceride, HDL and obesity showed significant relationship among hypertensive patients, as the TC, LDL and TG was significantly higher and HDL was lower in hypertensive patients.\(^{(7,8,9,10,11)}\)

In Bangladesh two studies conducted to assess the lipid profile, BMI and WC, and these studies showed that LDL, triglyceride, BMI and WC were higher and HDL was lower in hypertensive compared to normotensive participants.\(^{(12,13)}\)

Other studies conducted in India and Nigeria had found the relationship of high LDL, TG, TC and BMI in hypertensive patients and low HDL with high BMI and WC in hypertensive patients.\(^{(14,15)}\)

**Conclusion**

This study has revealed significant relationship between high serum TC, LDL, TG in hypertensive patient and low HDL, in which can lead to serious cardiovascular complications. BMI and WC were higher in hypertensive participants.

**Recommendations:**

We strongly recommend the hypertensive patients to have optimal BMI and WC and to check their lipid profile and treat any abnormality.

**Acknowledgments:** We appreciate the help and support of the laboratory department and internal medicine at Azadi teaching hospital in conducting this study.

**Ethical approval:** Official agreement were obtained from the local ethical committee of Kirkuk health directorate. Informed signed consent was obtained from each participant, data of the patients were collected in accordance with World Medical Association declaration of Helsinki, 2013 as a statement of ethical principles for medical research involving human.\(^{(16)}\)

**Conflict of Interest:** Author declares none

**Funding:** Self-funded

**References**

9. National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and
Treatment of High Blood Cholesterol in Adults


The Efficacy of Platelets Rich Plasma (PRP) for Ovarian Rejuvenation

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³Assistant Professor at High Institute of Infertility Diagnosis and Assisted Reproductive Technologies. Al Nahraim University (Alkadhmia, Baghdad), ⁴Professor Family Medicine, Family and Community Medicine Department, Alkindy College of Medicine (Mohamed Al-Qasim St, Baghdad)

Abstract

Background: In recent years, an increased approach has appeared in the use of autologous blood products to assist tissue and organ healing. Application of PRP has emerged as a potential solution for infertile women with poor ovarian reserve in reproductive specialty.

Objective: To estimate the efficacy of trans-vaginal ovarian injection with PRP in rejuvenation of ovaries in women with poor ovarian reserve.

Methods: A stratified, non-randomized, Before-After comparison clinical trial. It was performed in the High Institute for Infertility Diagnosis, and Baghdad fertility center from August 2018 to May 2019. 50 Infertile women of different age group with poor ovarian reserve were included.

For each patient, autologous PRP preparation was done and it was injected to both ovaries under ultrasound (US) guidance.

Outcome measures: hormones tests was measured before and after four weeks of intervention to monitor ovarian reserve tests. Before and after Follicle-stimulating hormone (FSH), anti-Müllerian hormone (AMH), antral follicles count (AFC), and mean ovarian volume (MOV) in different categories for variables.

Results: Infertile women showed a significant improvement of instead of ovarian reserve tests after PRP injection. A reduction in FSH level, an increase in AMH level, with an increase in AFC, and mean ovarian volume, were observed.

Conclusions: 4 weeks after PRP injection for ovarian rejuvenation had favorable effects in women with poor ovarian reserve, opening an opportunity window in management of infertility.

Keywords: PRP, ovarian rejuvenation, women infertility

Introduction

In recent years, an increased approach in the use of autologous blood products to assist healing in a variety of medical care interventions (¹). Of these products, PRP, prepared by centrifugation of peripheral blood, is obtained when the volume of plasma fraction of autologous blood having a platelet concentration more than 200,000 platelets/ul, with growth factors concentration 5 times greater than plasma, researches have revealed the application of PRP stimulates recovery and healing not only in affected tissues, but to overall organ function as well (²).

The identified causes of premature ovarian failure can be categorized into genetic and environmental, ovarian failure may end with infertility due to a lack of follicle growth and ovulation that leads to poor ovarian reserve (OR). Many studies stated that the introduction

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of platelets bearing growth factor directly into the ovaries might trigger recovery in oocyte production (3).

Treatment with PRP is labeled as ovarian rejuvenation; in this procedure, PRP is injected into the ovary under the guidance of ultrasound, similar to ovum pick up in in vitro fertilization (IVF) (4). This treatment modality is still being examined in many clinical trials all over the world as a promising method in order to regenerate the ovarian tissue and so they can have more possibilities for a successful pregnancy (5).

Ovarian reserve test (ORT) provides an indirect estimate of a woman’s remaining OR. It includes, in addition to ultrasound AFC, biochemical testing which includes FSH, AMH, and many other tests (6).

This study aimed to estimate the efficacy of transvaginal PRP injection to rejuvenate ovaries in woman with poor ovarian reserve, and to assess any association of some women variables (age, menstrual status, parity, BMI) as predicting factors in success of ovarian injection with PRP.

**Methods**

**Ethical Consideration:** The study protocol was approved by the authority of High Institute for Infertility Diagnosis & assisted reproductive Technology and the Arab Board of Health Specializations in Iraq. Written informed consent was obtained from each patient after detailed explanations for the purpose of the study, administration, possible benefits or not of the intervention.

**Trial Registration:** clinicaltrials.gov Identifier: NCT03946813

**Study Design & Setting:** This is a stratified, non-randomized, Before-After comparison clinical trial. It was performed at The High Institute for Infertility Diagnosis and Baghdad Specialized Fertility Center, during the period from August 2018 to May 2019.

The study included: Menopause or peri-menopause under the age of 50, Premature ovarian insufficiency or ovarian failure before the age of 40 or woman with primary ovarian failure of any cause, these women with high FSH level (more than 15 IU/l), low level of AMH (less than 0.9 ng/mL), and low AFC (3 or less follicles) on second day of menstrual cycle. Data collection from each patient about age, BMI, parity, pre (baseline) and post intervention level of AMH, FSH, AFC, and right & left ovarian volume.

The time of intervention for amenorrheic women was at any time, while in menstruating women, the procedure was performed early in the cycle during the menstrual period, or shortly after cycle prior to the development of an egg follicle. Patients were instructed to come in fasting status (for 8 hours prior to the procedure), since it will be done under anesthesia.

From each participant, about 18 ml of blood was taken and mixed with 2 ml anticoagulant to form 20 ml. This mixture was injected into a special kit tube and centrifuged.

The PRP rich top layer (rich with growth factors) was obtained. Immediately after mixing with calcium chloride activator, this extract was injected inside ovaries. The 20 ml blood sample gives 2.5 ml PRP, 1.25 ml would be injected in each ovary. The PRP preparation takes about 10-15 minutes.

**Outcomes measure:** In the next visit (after 4 weeks), AMH, FSH are measured together with measuring AFC and ovarian volume by ultrasound to assess the benefit of PRP. If AMH raised and AFC increased, or FSH decreased, then an objective evidence of ovarian rejuvenation was considered.

**Statistics:** Statistical analyses were performed using SPSS Statistics for Windows software (version 21.0; IBM Corp.). Descriptive statistics were demonstrated as number, frequency, percentage and table. Inferential statistics were obtained by using paired t test to estimate the significances of pre and post intervention. P value less than 0.05 considered statistically significant.

**Results**

The age of infertile women in this study sample (N=50) was ranged from 20 to 49 years, with mean (±SD) of 39.74 (7.03) years. The obesity and overweight constituted 60% of them with mean (±SD) of BMI of 26.49 (4.16). Based on the age, three groups were obtained: Group A from 20-29 years, Group B from 30-39 years, and Group C from 40-49 years. The BMI (Mean ±SD), infertility years (Mean ±SD), parity (No & %), and menstrual cycle status (No & %) of each age category are shown in table 1.
Table 1: The distribution of the studied sample according to age group, BMI, infertility period, parity and menstruation status.

<table>
<thead>
<tr>
<th>Age group</th>
<th>No (%)</th>
<th>BMI (Mean ±SD)</th>
<th>Infertility Period (Mean±SD)</th>
<th>Infertility type</th>
<th>Menstruation Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>7 (14)</td>
<td>(24.06 ±3.55)</td>
<td>(4.29± 1.02)</td>
<td>Primary No (%)</td>
<td>Regular No (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 (100)</td>
<td>4 (57.14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0 (0.00)</td>
<td>1 (14.29)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 (28.57)</td>
</tr>
<tr>
<td>30-39</td>
<td>13 (26)</td>
<td>(25.30 ±3.71)</td>
<td>(4.46 2±.62)</td>
<td>Secondary No (%)</td>
<td>Regular No (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 (61.54)</td>
<td>7 (53.85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5 (38.46)</td>
<td>4 (30.77)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 (15.38)</td>
</tr>
<tr>
<td>40-49</td>
<td>30 (60)</td>
<td>(27.03 ±4.39)</td>
<td>(5.73 3±.45)</td>
<td>Irregular No (%)</td>
<td>Regular No (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18 (60.00)</td>
<td>11 (36.67)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12 (40.00)</td>
<td>1 (3.33)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 (100)</td>
<td>(26.49 ±1.16)</td>
<td>(5.20 3±.82)</td>
<td>Regular No (%)</td>
<td>Regular No (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33 (66.00)</td>
<td>16 (32.00)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17 (44.00)</td>
<td>5 (10%)</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**FSH response to PRP**

Statistically significant reduction in FSH levels before and after PRP injection in the total women sample. The before FSH mean level (IU/l) was reduced from 31.85 (±12.03) to 25.24 (±11.63) after four week (p=0.004). But, after categorization of the women, only women with: age group 40-49, obesity, infertility more than 5 years, primary infertility, and irregular menstrual cycle or amenorrhea showed a non-significant reduction in FSH levels as shown in table 2.

Table 2: FSH levels (mean ±SD) before and after PRP injection according to age, BMI, Infertility duration, infertility type, menstrual cycle status and total sample.

<table>
<thead>
<tr>
<th>Age (years) Group</th>
<th>No (%)</th>
<th>FS (Mean ±SD) / IU/l</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>20-29</td>
<td>7 (14)</td>
<td>(36.00 ±10.02)</td>
<td>(28.00 ±10.94)</td>
</tr>
<tr>
<td>30-39</td>
<td>13 (26)</td>
<td>(33.24 ±12.38)</td>
<td>(25.85 ±11.03)</td>
</tr>
<tr>
<td>40-49</td>
<td>30 (60)</td>
<td>(26.38 ±11.60)</td>
<td>(22.34 ±12.15)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>20 (40)</td>
<td>(37.86 ±12.93)</td>
<td>(32.08 ±12.33)</td>
</tr>
<tr>
<td>Overweight</td>
<td>24 (48)</td>
<td>(29.04 ±12.71)</td>
<td>(17.76 ±10.48)</td>
</tr>
<tr>
<td>Obese</td>
<td>6 (12)</td>
<td>(23.03 ± 9.40)</td>
<td>(22.35 ±11.31)</td>
</tr>
<tr>
<td>Infertility Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>24 (48)</td>
<td>(26.23 ± 11.35)</td>
<td>(22.38 ±10.49)</td>
</tr>
<tr>
<td>≥5</td>
<td>26 (52)</td>
<td>(37.03 ± 13.27)</td>
<td>(27.88 ±13.45)</td>
</tr>
<tr>
<td>Infertility type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>33 (66)</td>
<td>(26.00 ±11.35)</td>
<td>(23.64 ±11.42)</td>
</tr>
<tr>
<td>Secondary</td>
<td>17 (34)</td>
<td>(34.86 ± 12.16)</td>
<td>(26.06 ±12.35)</td>
</tr>
<tr>
<td>Menstrual cycle Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>29 (58)</td>
<td>(25.54 ± 11.24)</td>
<td>(18.26 ±12.11)</td>
</tr>
<tr>
<td>Irregular</td>
<td>16 (32)</td>
<td>(41.59 ± 12.03)</td>
<td>(33.77 ±11.01)</td>
</tr>
<tr>
<td>Amenorrhea</td>
<td>5 (10)</td>
<td>(48.6 ± 20.6)</td>
<td>(38.4 ±13.3)</td>
</tr>
<tr>
<td>Total</td>
<td>50 (100)</td>
<td>(31.85 ±12.03)</td>
<td>(25.24 ±11.63)</td>
</tr>
</tbody>
</table>
AMH response to PRP

AMH levels showed a highly statistically significant increase in comparison of before and after PRP injection in the total women sample. The before AMH mean level (ng/mL) was increased from 0.125 (0.057) to 0.532 (0.087) after 4 week (p=0.001). But in category analysis, these significant increases were not shown only in women with: age group 20-29 years, and obesity (Tables 3).

Table 3: AMH levels (mean ±SD) before and after PRP injection according to age, BMI, Infertility duration, infertility type, menstrual cycle status and total sample.

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>No (%)</th>
<th>AMH (Mean ±SD)/ ng/mL</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>20-29</td>
<td>7 (14)</td>
<td>(0.314 ± 0.14)</td>
<td>(0.643 ± 0.29)</td>
</tr>
<tr>
<td>30-39</td>
<td>13 (26)</td>
<td>(0.092 ± 0.011)</td>
<td>(0.448 ± 0.047)</td>
</tr>
<tr>
<td>40-49</td>
<td>30 (60)</td>
<td>(0.096 ± 0.010)</td>
<td>(0.542 ± 0.132)</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>20 (40)</td>
<td>(0.124 ± 0.020)</td>
<td>(0.691 ±1.097)</td>
</tr>
<tr>
<td>Overweight</td>
<td>24 (48)</td>
<td>(0.140 ± 0.068)</td>
<td>(0.467 ±0.058)</td>
</tr>
<tr>
<td>Obese</td>
<td>6 (12)</td>
<td>(0.075 ± 0.011)</td>
<td>(0.258 ± 0.063)</td>
</tr>
<tr>
<td>Infertility Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>24 (48)</td>
<td>(0.105 ± 0.082)</td>
<td>(0.677 ± 0.062)</td>
</tr>
<tr>
<td>≥5</td>
<td>26 (52)</td>
<td>(0.1446 ± 0.022)</td>
<td>(0.3981 ± 0.164)</td>
</tr>
<tr>
<td>Infertility Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>33 (66)</td>
<td>(0.126 ± 0.068)</td>
<td>(0.579 ± 0.042)</td>
</tr>
<tr>
<td>Secondary</td>
<td>17 (34)</td>
<td>(0.124 ± 0.036)</td>
<td>(0.440 ± 0.073)</td>
</tr>
<tr>
<td>Menstrual cycle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>29 (58)</td>
<td>(0.161 ± 0.022)</td>
<td>(0.673 ± 0.082)</td>
</tr>
<tr>
<td>Irregular</td>
<td>16 (32)</td>
<td>(0.081 ± 0.013)</td>
<td>(0.374 ± 0.026)</td>
</tr>
<tr>
<td>Amenorrhea</td>
<td>5 (10)</td>
<td>(0.060 ± 0.062)</td>
<td>(0.2160 ± 0.035)</td>
</tr>
<tr>
<td>Total</td>
<td>50 (100)</td>
<td>(0.125 ± 0.057)</td>
<td>(0.532 ± 0.087)</td>
</tr>
</tbody>
</table>

AFC response to PRP

Statistically significant difference between before- after intervention means. The mean (±SD) had been raised from 0.86 (0.508) before to 2.29 (1.067) after PRP injection. This significant increased were also showed in all categories of study variables except in 20-29 year age group, obese women, and women with irregular cycle or amenorrhea as shown in table 4.

Table 4: AFC (Mean ±SD) before and after PRP injection in different age groups and total sample.

<table>
<thead>
<tr>
<th>Age (years) Age group</th>
<th>No (%)</th>
<th>AFC (Mean ±SD)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>20-29</td>
<td>7 (14)</td>
<td>(1.14 ± 0.710)</td>
<td>(2.71 ± 1.040)</td>
</tr>
<tr>
<td>30-39</td>
<td>13 (26)</td>
<td>(0.98 ± 0.425)</td>
<td>(2.65 ± 0.899)</td>
</tr>
<tr>
<td>40-49</td>
<td>30 (60)</td>
<td>(0.83 ± 0.634)</td>
<td>(2.24 ±1.217)</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>20 (40)</td>
<td>(0.80 ± 0.551)</td>
<td>(2.56 ± 1.772)</td>
</tr>
<tr>
<td>Overweight</td>
<td>24 (48)</td>
<td>(1.00 ± 0.622)</td>
<td>(2.17 ± 1.308)</td>
</tr>
</tbody>
</table>
Mean ovarian volume (OV) in cm³ response to PRP

The before-after intervention measurement of mean OV (both ovaries) also showed a statistically significant difference. The mean (±SD) elevated from 3.98 (1.761) to 5.21 (2.352) in the total study sample. But, in category-analysis, there were no such significant differences in; age groups 20-29, and 40-49 years, obese women, women with more than 5 years history of infertility, primary infertility women, and amenorrheic women as shown in table 5.
Discussion

One of the biggest challenges in the management of infertile women is the loss of ovarian reserve which might occurs at any age and for different reasons. This study examined PRP application to ovarian tissue with a view to document its effect on ovarian reserve among women attending for infertility treatment. To the best of our knowledge, this is the first study estimating this effect in Iraq and one of few in the region.

Before that, many centers in Europe and Middle East have reported success in women with Premature Ovarian Failure (POF), Diminished Ovarian Reserve, peri menopause and menopause through intra-ovarian injection with their own PRP and may result in successful pregnancies for patients that previously had no hope. The same was applied to endometrial PRP injection to improve implantation rate (7).

Promising results were found in this study, as the indicators for ovarian reserve volume (reduction in FSH level, increase in AMH level, with an increase in AFC, and mean ovarian volume) were change for positive findings. The exact mechanisms of PRP in this improvement are not exactly clear, but previous experimental studies have shown that the increased concentration of growth factors in PRP can potentially speed up the healing process. Growth factors promote wound healing by initiation of the following stages: Resolution, Chemo taxis, Cell regeneration, Cell proliferation and migration, Extracellular matrix synthesis, Remodeling, Angiogenesis, and Epithelialization (4).

A recent report on three live births in women with poor ovarian response following intra-ovarian injection of PRP was released in April 2019 (8). This study appeared to be the first report on the effects of intra-ovarian PRP injection not only on the increase of ovarian responses, but even on the spontaneous conceptions of women with poor ovarian response. These patients underwent ovarian stimulation, and the mean numbers of oocytes increased from 0.64 before PRP injection to 2.1 after rejuvenation. Two patients experienced spontaneous conceptions. The third case achieved clinical pregnancy and delivered a healthy baby in June 2018. Of course, this is a case report and further evidence of the application of PRP is hopped to achieve in the future, confirmed by the anticipated large clinical trials, to extrapolate that it could become an option for prematurely menopausal women aiming to achieve a pregnancy.

In conclusion, this study found that PRP is effective in ovarian rejuvenation in women with poor ovarian reserve as it improved clinical hormone levels of FSH, AMH toward normal ranges after 4 weeks. Moreover, it might increases the AFC and ovarian volume making more chance for ovulation and may be later for fertilization.

Ethical Clearance- Taken from The Arab Board of Health Specialization for Obstetrics and Gynecology in Iraq ethical committee and The High Institute for Infertility Diagnosis and Assisted Reproductive Technologies – Al Nahain University ethical committee

Source of Funding - Self

Conflict of Interest - Nil

References


The Effect of Prenatal Yoga in Reducing Pregnancy Complaints

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Abstract

There are physical and psychological changes during pregnancy which could lead to discomfort, especially during third trimester of pregnancy. Prenatal yoga is one of pregnant treatments with benefits to reduce signs and symptoms commonly experienced by pregnant women. The aim of this study is to find the effectiveness of prenatal yoga in reducing maternal discomfort at third trimester of pregnancy. We used quasi-experiment design with one group pretest – posttest design. This study was performed from July to October 2017 in four different primary healthcare units (Public Health Center) in Palu: Talise, Sangurara, Mabelopura, and Mamboro. Samples were obtained from pregnant women at third trimester of pregnancy, fit with our criteria in these Public Health Centers, amounted to 34 respondents in total. We collected the information by performing interview, observation and prenatal yoga as direct intervention. The data were then analyzed using Wilcoxon test. We found that the average complaints experienced by pregnant women during pretest were 7.21 with deviation standard (SD) of 3.4. Post-test data showed a mean of 3.06 with SD 1.7. Our statistical analysis of those comparison was p=0.000. There was significant difference of complains before and after prenatal yoga. Prenatal yoga could reduce pregnancy complains during third trimester of pregnancy.

Keyword: Prenatal Yoga, Pregnancy Complaints, third trimester of pregnancy.

Introduction

Anatomical, physiological, and biochemical adaptation will occur during pregnancy. Most of these changes begin shortly after fertilization occurs, and will continue to happen throughout the gestation period1. Dramatic weight gain makes pregnant women easily feel tired, have difficulties to fall asleep, breath shortness, foot and hand edema2. In line with fetal growth, there are changes in the shape and size of chest cavity due to fetal growth, causing pregnant women to experience breath shortness1,2.

Increased height of the uterine fundus accompanied by enlarged abdomen makes the body weight fall in the front. It happens so as an effort of adjusting to excessive body weight to push the spine backwards, creating lordosis posture. It causes the mother to feel sore waist, varicose veins and cramps in the legs. Muscle spasm is caused by traction of a number of nerves and muscles and is associated with lordosis posture in pregnancy1,2.

Changes in uterine size and body metabolism cause pregnant women to experience frequent urination, feeling hot flashes/ feverish heat, varicose veins in the limbs, hemorrhoids and constipation1,3,4.

Pregnant women are advised to do light exercise during pregnancy to keep their bladder healthy and reduce the problems normally appear during pregnancy5–7. Yoga is one of the mild exercise choices that can be done by pregnant women8,9.

Prenatal yoga focuses attention on the breath rhythm, prioritizes comfort and safety in training, thus providing many benefits10. Yoga is similar to body, mind and mental exercise that is highly helpful for pregnant women to flex joints and calm the mind, especially in the third trimester. Prenatal yoga has five ways, for instance yoga physical exercise, breathing (pranayama), position

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(mudra), meditation and deep relaxation that can be used to get benefits during pregnancy. It can also help smooth, natural, and healthy pregnancy and childbirth.

The objective of this research was to determine the effectiveness of yoga in reducing complaints of pregnant women in the third trimester of pregnancy in the Public Health Center of Palu.

**Material and Method**

**Research design**

The present research was quasi-experimental design research with the design of one group pretest-posttest design, as it measured changes in the level of complaints of mothers in the third trimester after performing a certain treatment, namely yoga. The research conducted observation before treatment (pretest) and after yoga intervention (post-test).

**Samples**

The respondents as samples of this research was 34 in total, using purposive sampling, namely the sampling taken from the entire pregnant women population in the work area of Mamboro, Sangurara, Mabelopura and Talise public health centers in August 2017, according to the inclusion criteria. The inclusion criteria for this research: willingness to be put under study, no pregnancy complications, and no preterm labor in previous pregnancies, the growth and development of the fetus according to gestational age, and no mental disorder.

**Data collection**

The research was carried out by examining the complaints of pregnant women in the third trimester before (pre-test) and after (post-test) prenatal yoga. After conducting interview for pre-test, Yoga was held for 8 times: twice every week for a month. Yoga were held in the morning and evening, according to the joint time contract between the researcher and the respondents. Yoga was conducted with duration of 30-60 minutes, including whole movement and relaxation/meditation. Each movement was done for 10 seconds, and 3 minutes for relaxation, meditation for breathing, respectively. The movements used in this research covered Mudhasana (child posture), Utkasana (seat posture), pelvic rocking, squatting posture, Baddha Konasana (butterfly posture), Sufi twirl, and meditation.

**Data analysis**

To analyze the data collected, the technique used was univariate analysis, with frequency distribution of respondent characteristics, independent variables and dependent variables. Bivariate analysis was to see the difference in the level of complaint of the experimental group before intervention. After the final treatment, Wilcoxon test was used with a significance value of 0.05 using a confidence interval of 95%.

**Results**

Based on the level of education and employment (Table 1), it appears that the majority of pregnant women earned higher education (82.4%); and most of them are housewives. Based on age, it was known that the average age of pregnant women was 27.08 years old mean age of 28 years old, and SD 4.8, the youngest was 19, while the oldest was 37.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>28</td>
<td>82.4</td>
</tr>
<tr>
<td>Low</td>
<td>6</td>
<td>17.6</td>
</tr>
<tr>
<td><strong>Occupation:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed women</td>
<td>5</td>
<td>14.7</td>
</tr>
<tr>
<td>Housewives</td>
<td>29</td>
<td>85.3</td>
</tr>
<tr>
<td><strong>Age (Year)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>27.08 ± 4.8</td>
<td></td>
</tr>
<tr>
<td>Min – Max</td>
<td>19 – 37</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Distribution of Respondent Complaints, before and after Prenatal Yoga

<table>
<thead>
<tr>
<th>No.</th>
<th>Respondent Complaints</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Easily exhausted</td>
<td>26</td>
<td>76,5</td>
</tr>
<tr>
<td>2</td>
<td>Difficulties to fall asleep</td>
<td>22</td>
<td>65</td>
</tr>
<tr>
<td>3</td>
<td>Breath shortness</td>
<td>18</td>
<td>53</td>
</tr>
<tr>
<td>4</td>
<td>Foot and hand edema</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>Low back pain</td>
<td>19</td>
<td>56</td>
</tr>
<tr>
<td>6</td>
<td>Muscle spasm</td>
<td>9</td>
<td>26,4</td>
</tr>
<tr>
<td>7</td>
<td>Anxiety</td>
<td>14</td>
<td>41,1</td>
</tr>
<tr>
<td>8</td>
<td>Lower abdominal pain</td>
<td>23</td>
<td>68</td>
</tr>
<tr>
<td>9</td>
<td>Feverish heat and hot flashes</td>
<td>22</td>
<td>65</td>
</tr>
<tr>
<td>10</td>
<td>Frequent urination</td>
<td>31</td>
<td>91,1</td>
</tr>
<tr>
<td>11</td>
<td>Foot Cramps</td>
<td>19</td>
<td>56</td>
</tr>
<tr>
<td>12</td>
<td>Fake Contractions</td>
<td>16</td>
<td>47</td>
</tr>
<tr>
<td>13</td>
<td>Varicose veins</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>14</td>
<td>Hemorrhoids</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>15</td>
<td>Stretch March</td>
<td>14</td>
<td>41,2</td>
</tr>
<tr>
<td>16</td>
<td>Constipation</td>
<td>10</td>
<td>29,4</td>
</tr>
</tbody>
</table>

From 34 respondents, interviews were conducted to 16 complaints mostly felt by pregnant women. As shown in Table 2, frequent urination was the most common complaint during pre-test (91.1%), while the least perceived complaint was hemorrhoids (9%). After Yoga, post-test interviews were conducted with the results showing that all respondents no longer felt muscle spasms (0%). Even so, lower abdominal pain and frequent urination were felt by half (50%) of the total respondents.

This bivariate analysis used paired T test for the hypothesis to see the difference on reduced complaints perceived by pregnant women in the third trimester, before and after prenatal yoga. Therefore, the normality test result of Shapiro-Wilk test produced a probability value (p) <α (0.05), which meant that the data were not normally distributed. Therefore, the hypothesis test used was Wilcoxon test. The results of the statistical analysis (Table 3) show that the mean score of pre-test and post-test complaints is 4.7. Wilcoxon test obtains significance p value of = 0.000, therefore the p value is = 0.000 <α = 0.05. It can be concluded that prenatal yoga is effective in reducing complaints in third trimester of pregnancy.

Table 3. Statistical Result Analysis of Effectiveness, before and after Prenatal Yoga

<table>
<thead>
<tr>
<th>Compliments</th>
<th>N</th>
<th>Mean rank</th>
<th>Z</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>34</td>
<td>4,7</td>
<td>-4,68</td>
<td>0.000</td>
</tr>
<tr>
<td>Post test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussions

There are sixteen pregnancy complaints as a measurement of the effectiveness of prenatal Yoga in this research: fatigue, difficulty to fall asleep, breath shortness, edema, low back pain, muscle spasm, anxiety, lower abdominal pain, feverish heat and hot flashes, frequent urination, feet cramps, fake contractions, varicose vein, hemorrhoids, stretch marks, and constipation.

Data analysis, in general, shows a significance value of p = 0.000 (p <0.05), indicating that prenatal exercise has real and significant potential in reducing pregnancy complaints. A number of movements performed in Yoga
have an impact on various organ systems that each plays a role in causing complaints in the third trimester of pregnancy.

Systemic inflammatory response and increased CRP level occur during pregnancy. Lack of physical activity, coupled with psychological factors can turn pregnant women vulnerable to inflammation and other disorders associated with inflammation and hormonal fluctuations

Hot flashes are generally felt by women who have reached menopause health, or lifestyle factors.

METHODS We followed 3198 women enrolled in the Study of Women’s Health Across the Nation during 1996 through 2002. We analyzed frequency of vasomotor symptom reporting using longitudinal multiple logistic regressions. RESULTS Rates of vasomotor symptom reporting were highest among African Americans (adjusted odds ratio [OR]=1.63; 95% confidence interval [CI]=1.21, 2.20. However, these symptoms can also occur in pregnant women due to hormonal fluctuations. Physical activity can help improve changing body’s metabolism during pregnancy, thus reducing complaints of hot flashes. However, frequent and regular physical activity is needed to completely eliminate the complaints.

Frequent complaints of frequent urination are caused by the influence of progesterone hormone. Increased glomerular filtration is sometimes exacerbated by the occurrence of pyelonephritis as another effect of anatomical changes in the ureter, causing this complaint to be quite common. Yoga, besides playing a role in helping control hormonal fluctuations, can also help reduce symptoms of anatomical and physiological changes during pregnancy.

Disorders of the circulatory system and respiration see a decrease after doing Yoga. It is evident from the reduced complaints of fatigue and breath shortness. Anatomical changes due to pressure from pregnancy on the diaphragm which narrowed chest cavity could be handled through exercise. Mechanical adaptation to the respiratory system, including increased resting inspiration capacity and bronchodilator, leads to increased VT expansion when pregnant women are engaged in physical activity. Through regular activities, therefore, fatigue and breath shortness complaints can be resolved properly.

Musculoskeletal complaints, i.e. low back pain, muscle spasm, stretch marks, and foot cramps are also proven to have been reduced through Yoga. Practicing yoga on regular basis can improve muscle health, blood circulation, balance and range of motion. Relaxation that appears through Yoga can also help muscle relaxation which results in reduced musculoskeletal complaints.

The scientific explanation of the physiological effects of each movement in prenatal Yoga makes these sixteen movements in this research usable as basic Yoga movement. The results of this research also illustrate the significance of changes in complaints, before and after the research. These movements, therefore, can be recommended for use in Public Health Centers and other institutions that wish to include prenatal yoga as one of their programs.

The present research is not conducted throughout the third trimester, but only for 1 month. Further research, especially conducted throughout the third trimester, is needed to determine the effects of this exercise within lengthy period of time. Also, items of physiological pregnancy disorders that may change during pregnancy can be added in the third trimester as effectiveness indicators of prenatal yoga.

Conclusion

Yoga has considerably good effectiveness in controlling and reducing complaints during the pregnancy.

Ethical Clearance: Taken from Health Polytechnic of Palu committee.

Source of Funding: Self funding

Conflict of Interest: None

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7. Mary AJK, Latheef F. Effectiveness of selected mind body interventions on anxiety related to childbirth and labour outcomes. NISCAIR-CSIR. 2017;16(June):122–8.


Effectiveness of Clindamycin in Treatment of Periodontitis

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Abstract

Clindamycin is a systemically administered antibiotic to support periodontal treatment. Each antibiotic has specifications in destroying microorganisms.

Giving prescription drugs for handling a bacterial infectious disease must consider the effectiveness of these antibiotics, therefore to see the level of bacterial sensitivity to certain antibiotics a bacterial sensitivity test is carried out in vitro. It is important to do research to see whether clindamycin is still effectively used for the treatment of periodontitis in patients at RSGM Kandea Makassar.

Identification of bacteria from patient samples was diagnosed with periodontitis to obtain Porphyromonas gingivalis (P. gingivalis) and Aggregatibacter actinomycetemcomitans (A. actinomycetemcomitans) bacteria in the Microbiology laboratory of the Faculty of Medicine, Hasanuddin University. From 20 samples, A. actinomycetemcomitans were identified in 13 samples and P. gingivalis bacteria in 4 samples. From the disc diffusion test, 8 samples (61.5%) of A. actinomycetemcomitans and 3 samples (75%) of P. gingivalis were still sensitive to Clindamycin.

From these results it can be concluded that clindamicyn antibiotics are still quite effective in killing bacteria that cause periodontitis. Clindamicyn is still an alternative medicine for bacterial infections of the oral cavity.

Keywords: Clindamycin, Treatment Periodontitis

Introduction

Antibiotics are needed to remove bacteria from periodontal tissue. The most common antibiotics used in periodontal treatment are penicillin, metronidazole, tetracycline and clindamycin. Irrational use of antibiotics can cause resistance. Resistance is the ability of bacteria to neutralize and weaken the working power of antibiotics.

In Southeast Asia the problem of antibiotic resistance is also quite serious. WHO Southeast Asia region sets out several strategies, among others by rationalizing antibiotic use, reducing selection preassure, changing the behavior of antibiotic prescribers and making the issue of antibiotic resistance a national problem in every country in Southeast Asia. Mechanism of antibiotic resistance involving various biochemical mechanisms in bacterial cells can be explained by the existence of mutations in genes that encode one of the components involved in biochemical interactions between antibiotics and bacteria. Phenotypic changes in bacteria can result in bacterial resistance to antibiotics.

Clindamycin is a systemically administered antibiotic to support periodontal treatment which has shown good results. Each antibiotic has specifications in destroying microorganisms.

Antibiotics can be classified based on the mechanism of action into six major groups, namely:

Inhibits cell wall synthesis, including: penicillins, cephalosporins, vancomycin, inhibits betalactamase, carbapenems, aztreonam, polymyxin and bacitracin;

Inhibits protein synthesis, including: aminoglycosides (gentamicin), tetracyclines, macrolides, chloramphenicol, clindamycin, linezolid and streptogramins;

Inhibits DN synthesis, including: fluoroquinolones and metronidazole;
Inhibits RNA synthesis, including: rifampicin;
Inhibits the synthesis of mycolic acid, including: isoniazid;
Inhibits folic acid synthesis, including: sulfonamides and trimethoprim.

**Clindamycin**

Clindamycin is a semisynthetic derivative of lincomycin, a natural antibiotic produced by actinobacterium Streptomyces lincolnensis. Lincosamide (eg lincomycin, clindamycin) is a class of drugs that bind the 23S part of the bacterial 50S subunit and inhibits the initial elongation of the peptide chain by inhibiting the transpeptidase reaction. In this sense, they have similar actions towards macrolides.\textsuperscript{6,7}

Clindamycin has a bacteriostatic effect. It is used primarily to treat infections caused by anaerobic bacteria.\textsuperscript{5,8} Clindamycin can also be used in combination with chloroquine and quinine to treat malaria caused by Plasmodium falciparum. This is commonly used as a topical treatment for acne, and can be useful in some methicillin-resistant Staphylococcus aureus infections (MRSA).\textsuperscript{5}

Clindamycin is used in the treatment of recurrent periodontal diseases, especially if mechanical treatment or other antibiotic treatments (penicillin and tetracycline) do not show success.\textsuperscript{9}

The mechanism of resistance in bacteria includes mutations, inhibition of enzymatic antibiotic activity, protein changes which are targets of antibiotics, changes in metabolic pathways, antibiotic efflux, changes in the channel and changes in membrane permeability.\textsuperscript{10,11}

Gram negative bacteria such as Aggregatibacter actinomycetemcomitans, Fusobacterium nucleatum, Porphyromonas gingivalis, Prevotella intermedia and Eikella corrodent types of dental plaque bacteria in healthy periodontal tissues.\textsuperscript{12} Systemic antibiotic therapy for periodontal treatment is usually monotherapy including amoxicillin, metronidazole, tetracyclines (tetracycline, doxycycline, minocycline), clindamycin and ciprofloxacin.\textsuperscript{13}

**Method**

The type of research that will be conducted is descriptive. The sample used in this study were patients diagnosed as periodontitis in the Dental and Oral Hospital of the Faculty of Dentistry, Hasanuddin University, Makassar. The number of samples were 20, the sampling method used in this study was purposive sampling.

**Tools and Materials**

1. A. Tools
2. Gloves (Handscone)
3. Masks
4. Test tube
5. Mouthpiece
6. Sonde
7. Tweezers
8. Nierbecken
9. Excavator
10. Stationery
11. Camera
12. Tube
13. Petri dish
14. Ose
15. Tube racks
16. Cold box
17. Lamp spirits
18. Glass object
19. Autoclave
20. Incubator
21. Microscope
22. Cotton swabs
23. Calipers

B. Materials

1. Specimen of subgingival bacteria
2. Medium transport: BHIB
3. Bacterial Culture Medium: Nutrient Agar (NA), Mac Conkey Agar (Me)

**Procedures**

Samples that met the criteria were taken for bacterial specimens in the subgingival area using swabs. Swabs containing bacterial specimens were put
into the transport medium and then tightly closed and taken to the Microbiology Laboratory of the Faculty of Medicine for further examination. Bacterial culture was carried out into Sodium Agar (NA) and MacConkey (Me) media in petri dishes, then incubated for 24 hours at 37°C. After incubation then carried out gram staining and looked at the colony (microscopic), biochemical test (not done). An interpretation of the type of bacteria present in the sample was carried out. Bacterial culture which was included in the criteria into the medium NA slant. Bacteria originating from medium NA slant were suspended (MHA bacterial suspension into sterile 0.9 NaCl, mac fallen standard turbidity 0.5).

Bacterial culture into the MHA medium for sensitivity testing. Test the sensitivity of the test by inserting an antibiotic paper disc, and then incubation for 24 hours at 37°C. Measuring the inhibitory zone using calipers to see the results of the bacterial sensitivity test.

**Results**

Identification of Bacteria

Based on the research carried out, bacteria were identified in periodontitis patients at the Dental and Oral Hospital (RSGM) in Kandea Makassar (table 1).

<table>
<thead>
<tr>
<th>No. Sample</th>
<th>Microbe</th>
<th>n</th>
<th>Negative</th>
<th></th>
<th>Positive</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>K01</td>
<td><em>A. actinomycetemcomitans</em></td>
<td>20</td>
<td>7</td>
<td>35.0</td>
<td>13</td>
<td>65.0</td>
</tr>
<tr>
<td>K02</td>
<td><em>P. gingivalis</em></td>
<td>20</td>
<td>16</td>
<td>80.0</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>K03</td>
<td>Candida sp.</td>
<td>20</td>
<td>15</td>
<td>75.0</td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td>K04</td>
<td>Propionibacterium</td>
<td>20</td>
<td>17</td>
<td>85.0</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>K05</td>
<td><em>S. Pneumoniae</em></td>
<td>20</td>
<td>19</td>
<td>95.0</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>K06</td>
<td>Fusobacterium sp.</td>
<td>20</td>
<td>19</td>
<td>95.0</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>K07</td>
<td>Staphylococcus</td>
<td>20</td>
<td>19</td>
<td>95.0</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>K08</td>
<td>E. coli</td>
<td>20</td>
<td>19</td>
<td>95.0</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>K09</td>
<td>Klebsiella</td>
<td>20</td>
<td>18</td>
<td>90.0</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>K10</td>
<td>Enterobacter Agglomerous</td>
<td>20</td>
<td>18</td>
<td>90.0</td>
<td>2</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Based on biochemical and physiological tests, 10 types of microbes have been identified, namely *Bacteria A. actinomycetemcomitans* amounting to 13 (65%), *P. gingivalis* as many as 4 (20%), Propionibacterium as many as 3 (15%), Klebsiella as many as 2 (10%), Enterobacter agglomerous as many as 2 (10%), *S. Pneumoniae* as many as 1 (5%), Fusobacterium as many as 1 (5%), Staphylococcus as many as 1 (5%), and E. coli as many as 1 (5%) and Candida sp. as many as 5 (25%).

**Bacterial Resistance Levels**

The bacteria found in people with periodontitis were not all bacteria that may cause periodontitis. Based on the formulation of the problem that we have determined, we will test antibiotic resistance in pathogenic bacteria that cause periodontitis. Bacteria that causes periodontitis in this case are bacteria *Porphyromonas gingivalis* (*P. gingivalis*) and *Agregatibacter actinomycetemcomitans* (*A. actinomycetemcomitans*). Of the 20 samples we took were identified *A. actinomycetemcomitans* in 13
samples and P. gingivalis bacteria in 4 samples. The results of the resistance test for A. actinomycetemcomitans and P. gingivalis bacteria can be seen in Table 2 below.

### Table 2. Bacterial resistance test results

<table>
<thead>
<tr>
<th>Microbe</th>
<th>n</th>
<th>Sensitive</th>
<th></th>
<th>Resistant</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>%</td>
<td>Total</td>
<td>%</td>
</tr>
<tr>
<td>A. actinomycetemcomitans</td>
<td>13</td>
<td>8</td>
<td>61.5</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td>P. gingivalis</td>
<td>4</td>
<td>3</td>
<td>75.0</td>
<td>1</td>
<td>25.0</td>
</tr>
</tbody>
</table>

Of the 13 samples A. actinomycetemcomitans the number of samples that are still sensitive is 8 samples (61.5%) and for P. gingivalis samples, there are 3 (75%) samples that are still sensitive to clindamycin.

#### Discussion

**Identification of Bacteria**

In this study, bacteria were identified in periodontitis patients and carried out bacterial resistance testing for periodontitis with clindamycin antibiotics. The main bacteria causing periodontitis tested in this study were the bacteria Aggregatibacter actinomycetemcomitans (Aa) and Porphyromonas gingivalis (Pg). Aggregatibacter actinomycetemcomitans is an anaerobic Gram-negative bacterium in the form of a coccus measuring around 0.4x1.0 μm while Porphyromonas gingivalis is a melanogenic, non-monolytic, and part of anaerobic negative Black-pigmented Gram colonies.

In this study 10 types of microbes were identified, namely Aa Bacteria of 13 (65%), Pg of 4 (20%), Propionibacterium of 3 (15%), Klebsiella of 2 (10%), Enterobacter agglomerus of 2 (10%), S. pneumoniae of 1 (5%), Fusobacterium of 1 (5%), Staphylococcus of 1 (5%), and E. coli and Candida sp. of 5 (25%).

In this study the most common bacteria were Aa bacteria, which is as much as 65%, which is in line with research conducted in Finland, namely 50% of adult periodontitis containing the bacterium Aggregatibacter actinomycetemcomitans.14

The lack of the type of bacteria obtained in each sample is also likely to be caused by bacteria found in periodontitis are anaerobic bacteria while the culture process is not carried out anaerobically.

#### 5.2 Levels of resistance of bacteria Aa and Ph to clindamycin antibiotics

According to Krismariono A., systemic antibiotics help with mechanical treatment. Each antibiotic has certain specifications, so it is important to test the main bacterial sensitivity for the cause of periodontitis with antibiotics to be given. As in this case the clindamycin antibiotic which is a bacteriostatic antibiotic that works to inhibit bacterial protein synthesis, is very effective against anaerobic bacteria that produce enzymes β-lactamase.3

Systemic use of clindamycin antibiotics can reduce the rate of tooth loss due to periodontal disease.14 In addition to systemic, topical administration of clindamycin in concentrations below 1% is also effective in aiding the treatment of periodontal disease.15

In other studies, it is recommended to reduce the use of clindamycin antibiotics in patients with caries or periodontal disease. This is because the bacteria isolated from dental plaque found a resistance level of 83%.16

The results of our research, from 13 samples of A. actinomycetemcomitans, the number of samples that were still sensitive was 8 samples (61.5%) and for samples of P. gingivalis, there were 3 (75%) samples that were still sensitive to clindamycin.

From these results it can be seen that clindamycin antibiotics are still quite effective in killing bacteria that cause periodontitis. this is in line with the results of a study conducted by Gunawan S. et al. who conducted a study of differences in the antibacterial power of zinc oxide-based root canal medicaments in combination with 5% clindamycin hydrochloride and calcium hydroxide against enterococcus faecalis bacteria. In this study the zinc oxide combination of clindamycin hydrochloride...
was 5% more effective than other medicaments. This proves that clindamicyn is still an alternative drug for bacterial infections of the oral cavity.

The relationship between drug consumption patterns and resistance levels

Definite resistance begins with antibiotic exposure, and although only one or two bacteria can survive, they have the opportunity to create a new strain that is resistant. This new resistant strain can spread from one person to another, increasing its potential in epidemic proportions. This spread is facilitated by weak infection control and extensive use of antibiotics. Resistance is defined as the inhibition of bacterial growth by giving systemic antibiotics with normal doses that should or minimum inhibitory levels. Whereas multiple drugs resistance is defined as resistance to two or more drugs and drug classification. While cross resistance is the resistance of a drug followed by other drugs that have never been exposed Resistance occurs when bacteria change in one way or another that causes a decrease or loss of effectiveness of drugs, chemical compounds or other ingredients used to prevent or treat infections.

Conclusion

In this study 10 types of microbes were identified in subgingival specimens of periodontitis patients. The bacteria that caused periodontitis, Aggregatibacter actinomycetemcomitans (A. actinomycetemcomitans), are found in 13 samples (65%) and Porphyromonas gingivalis (P. gingivalis) in 4 samples (20%). Resistance tests were carried out on two types of bacteria. Obtained the results of A. actinomycetemcomitans bacterial resistance to clindamicyn reaches 38.5% while the level of resistance of P.gingivalis bacteria to Clindamicyn is 25.0%

Conflict of Interest: There is no conflict of interest in this study.

Source of Funding: Domestic government

Ethical Clearance: This study obtained a label of ethics escaped by the number: 0080/PL09/KEPKFKG - RSGMUNHAS/2018 and register number UH 17120068 on Oktober 9, 2018.

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A Comparison Between Luteal Phase Treatment with Estradiol and GnRH Antagonist for Ovarian Follicular Synchronization in ICSI Cycle

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Abstract

The Objective of this study is to compare the results of luteal phase treatment by estradiol versus GnRH antagonist on antral follicular size coordination and hormonal levels before ICSI cycles, assessment of follicular growth synchronization during controlled ovarian stimulation and evaluate ICSI outcome. This a prospective randomized clinical trial included 60 infertile women evaluated in second day of menstrual cycle for antral count and their sizes, FSH, LH, estradiol, and progesterone, then assigned randomly according to luteal treatment to 3 groups; with 20 patients in each treated with estradiol, or cetrorelix acetate or no treatment. All then enrolled in ICSI with flexible antagonist protocol. Findings revealed significantly reduction of antral follicles sizes, and improve their growth symmetry in early follicular phase after treatment, reduction in second day FSH, LH and progesterone. Reduction in follicular growth discrepancies at day 8. At trigger day the antagonist group had a significant more numbers of the follicles size ≥17 mm. larger number of retrieved–oocytes, (MII) than other groups, (P<0.05). No significant difference in biochemical and clinical pregnancy rates between groups. In conclusions premenstrual estradiol or GnRH antagonist treatment decrease size discrepancies of antral follicles, and improve synchronization of their growth.

Keywords : ICSI, synchronization, GnRH antagonist, estradiol.

Introduction

Through the initial follicular portion of the menstrual cycle, the size of the antral follicle is usually heterogeneous. These differences in follicle size are due to the early exposure of F.S.H. -sensitive follicles to F.S.H. gradient-concentrations through-out the luteal phase1,2. This event, may potentially impact the outcomes of controlled ovarian stimulation (COS), because of the pre-existing asynchronous follicle size may disturb coordinated follicular growth during COS3. In addition, at COS, asynchronous follicular growth can be intensified by the administration of exogenous FSH and as the exogenous FSH begins in the early follicular phase, a period in which endogenous FSH levels dropped to lower than the threshold for the already existed antral follicles. This results in the growth of some of the antral follicles to preovulatory stage and this more likely lead to further discrepancies in the sizes of the growing follicles throughout the COS, this more likely to intensify the differences in the sizes of the grown follicles during COS, which results in a decrease in the maturity of the oocytes and the rate of fertilization, which inversely affects the number of transferable embryos and the probability of conception4,5.

Many approaches can be used in ART to ascertain the good synchronization of the antral follicle, one of these approaches is suppression of the natural increase in the level of FSH during luteofollicular transition by medications6,7. The pre-treatment of estradiol lead to reduced premature gradual exposure of the follicles to

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FSH in the late luteal phase by inhibiting the secretion of GnRH and during the succeeding early follicular phase in the next cycle, a significant condensation of the mean follicular size with improved homogeneity in the overall follicles size through the follicular phase. It also induces the formation of FSH-receptor in the resistant-follicles and leads to further coordinated gonadotropin responses.\textsuperscript{8,9}

The GnRH antagonist when administered in the mid-luteal phase, results in premature decease of the corpus leuteum which leads to a new group of healthy follicles by discontinuing the inhibitory effect of the progesterone on the growth of the antral follicles, furthermore, it results in optimal synchronization of the sizes of antral follicles via prevention of the elevation of the levels of premature FSH throughout the luteo-follicular conversion. during luteo-follicular transition, and after the acutely induced luteolysis, there is FSH flare-up that positively could influence follicular growth and estrogen concentrations in serum.\textsuperscript{10,11}

Patients and Method

This was a prospective randomized clinical trial conducted at the Fertility center- AL Sadder Medical city, AL-Najaf, Iraq between November 2018 to the May 2019.

It included 60 women who attend for ICSI cycle having either primary or secondary infertility.

**Inclusion criteria:** Age 20-35 years, BMI 18-25Kg/m\(^2\), regular cycle(25-35days), the 2 ovaries seen with normal uterus, no previous hormonal treatment within the last three months.

**Exclusion criteria:** Single ovary, ovarian cyst or had ovarian cystectomy, endometriosis, pelvic inflammatory diseases, history of autoimmune, endocrine or metabolic disorders, severe male factor or azoospermia, and hypogonadotrophic hypogonadism.

Participant women were assigned randomly into 3 groups with 20 women in each:

- **Estradiol group** received oral estradiol 4 mg/ day from day 20 of the menstrual cycle, until first day of next cycle.

- **GnRH Antagonist group** received cetrorelix acetate as daily subcutaneous injections of 0.25 mg for 3 consecutive days before the first day of suspected next cycle.

**Control group** started with ICSI cycle of flexible antagonist protocol immediately without luteal phase treatment.

Patients in Estradiol and GnRH antagonist groups were reevaluated in the second day of the second menstrual cycle (immediately after luteal phase treatment) for FSH, LH, estradiol, and progesterone, then enrolled in a flexible antagonist protocol.

In all groups the stimulation was initiated on day 2 of the cycle. Recombinant FSH in form of follitropin alpha was administered subcutaneously, starting dose ≥ 150IU were adjusted to each individual according to AMH, FSH, age, BMI, and previous IVF cycles response, the starting dose constantly maintained for five days, then subsequently set according to the ovarian response. The follicular growth was monitored by transvaginal ultrasonography performed on day 6 and 8 of stimulation, then continue every two days until day of trigger. When the leading follicles diameter reached 12-14 mm, cetrorelix acetate 0.25 mg was given as daily subcutaneously up to the time of HCG intake. In all groups when at least three follicles ≥ 18 mm were obtained, serum estradiol and progesterone levels were detected, and an i.m. injection of hCG (5000-10,000 IU) were given at 11:00 pm.

Transvaginal oocyte retrieval(OR) achieved 35-36 hours later. ICSI was done, and embryos transfer was performed two days later.

Data analysis performed by SPSS version 25. Appropriate statistical tests were applied at level of significance of 0.05.

Results

Findings revealed a significant increment in the recruited antral follicles, significant reduction of their sizes, and improve their growth symmetry in the early follicular phase in both treatment groups, (Table 1). At day 2, a significant reduction in the levels of serum-LH and FSH after treatment with E2 or antagonist was reported, (P.value<0.05). Estradiol-levels were elevated significantly in estradiol group, while they reduced in antagonist group, (P.value< 0.05). There was a significant reduction in progesterone levels after
estradiol and antagonist treatment (P<0.05). Antagonist reduced the FSH, and progesterone more significantly than estradiol. (Table 2)

A significant increment in number of follicles that measured 15-16mm in antagonist group (p =0.001), and good reduction in follicular growth discrepancies at day 8. At day of trigger the antagonist group had lower number of follicles of 11-14 mm, 15-16 mm, and higher number of follicles ≥17 mm, (P<0.05), than other 2 groups, progesterone was more elevated in the estradiol group. Higher number of retrieved oocytes and MII in antagonist group (P<0.05), and higher number of embryos transferred in estradiol and antagonist groups than controls (P<0.05). (Table 3)

The HCG positive rate in estradiol group (20%), in GnRH antagonist group (35%), and in control it was (30%) (Figure 1). The clinical pregnancy rates of the studied groups were (20%) , (30%), and (25%), respectively, (Figure 2). The clinical pregnancy rates of the studied groups out of HCG positive cases were 100%, 86% and 83%, among the three groups, respectively, (Figure 3).

### Table 1. Mean follicles counts before and after treatment in Estradiol and GnRH antagonist groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estradiol</th>
<th>GnRH antagonist</th>
<th>P. value between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean Total Antral follicles count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretreatment</td>
<td>13.45</td>
<td>11.75</td>
<td>0.268</td>
</tr>
<tr>
<td>After treatment</td>
<td>15.7</td>
<td>13.15</td>
<td>0.185</td>
</tr>
<tr>
<td>P.value**</td>
<td>0.001*</td>
<td>0.032*</td>
<td></td>
</tr>
<tr>
<td>mean No. of follicles 2-5 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretreatment</td>
<td>5.6</td>
<td>4.7</td>
<td>0.292</td>
</tr>
<tr>
<td>After treatment</td>
<td>9.85</td>
<td>10.2</td>
<td>0.817</td>
</tr>
<tr>
<td>P.value**</td>
<td>0.001*</td>
<td>0.001*</td>
<td></td>
</tr>
<tr>
<td>mean No .of Follicles 6-10 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretreatment</td>
<td>5.7</td>
<td>5.05</td>
<td>0.541</td>
</tr>
<tr>
<td>After treatment</td>
<td>5.55</td>
<td>2.85</td>
<td>0.001*</td>
</tr>
<tr>
<td>P.value**</td>
<td>0.883</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>mean No. of follicles &gt;10 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretreatment</td>
<td>2.05</td>
<td>2</td>
<td>0.866</td>
</tr>
<tr>
<td>After treatment</td>
<td>0.35</td>
<td>0.1</td>
<td>0.061</td>
</tr>
<tr>
<td>P.value**</td>
<td>0.001*</td>
<td>0.001*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at P<0.05

**Paired t test for the change within group
Table 2. Comparison of mean hormonal levels of in 2nd day of menstrual cycle between treatment groups

<table>
<thead>
<tr>
<th>Hormones</th>
<th>Estradiol group</th>
<th>GnRH antagonist group</th>
<th>P value Between group</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean FSH (m IU/ml)</td>
<td>6.1</td>
<td>6.22</td>
<td>0.844</td>
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<tr>
<td>Pretreatment</td>
<td>4.26</td>
<td>3.1</td>
<td>0.032*</td>
</tr>
<tr>
<td>P.value**</td>
<td>0.001*</td>
<td>0.001*</td>
<td></td>
</tr>
<tr>
<td>mean LH (mIU/ml)</td>
<td>4.08</td>
<td>5.58</td>
<td>0.135</td>
</tr>
<tr>
<td>Pretreatment</td>
<td>3.03</td>
<td>2.07</td>
<td>0.07</td>
</tr>
<tr>
<td>P.value**</td>
<td>0.006*</td>
<td>0.001*</td>
<td></td>
</tr>
<tr>
<td>mean Estradiol (pg/ml)</td>
<td>34.42</td>
<td>49.32</td>
<td>0.157</td>
</tr>
<tr>
<td>Pretreatment</td>
<td>45.98</td>
<td>23.19</td>
<td>0.001*</td>
</tr>
<tr>
<td>P.value **</td>
<td>0.018*</td>
<td>0.015*</td>
<td></td>
</tr>
<tr>
<td>mean Progesterone (ng/ml)</td>
<td>1.067</td>
<td>1.332</td>
<td>0.251</td>
</tr>
<tr>
<td>Pretreatment</td>
<td>1.03</td>
<td>0.564</td>
<td>0.002*</td>
</tr>
<tr>
<td>P.value **</td>
<td>0.015*</td>
<td>0.001*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at P<0.05
**Paired t test for the change within group

Table 3. Significant changes and outcomes of the studied groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group</th>
<th></th>
<th></th>
<th>P. value between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Estradiol</td>
<td>GnRH</td>
<td>antagonist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>antagonist</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>No. of follicles 11-14 mm on day 6 of stimulation</td>
<td>4.3</td>
<td>4.7</td>
<td>2.7</td>
<td>0.023 *</td>
</tr>
<tr>
<td>No of follicles 15-16 mm on day 8 of stimulation</td>
<td>3.2</td>
<td>6.6</td>
<td>2.6</td>
<td>0.001*</td>
</tr>
<tr>
<td>No. of follicles 11-14 mm at day of trigger</td>
<td>2.4</td>
<td>0.3</td>
<td>3.9</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>No of follicles 15-16 mm at day of trigger</td>
<td>3.3</td>
<td>2.2</td>
<td>4.4</td>
<td>0.027*</td>
</tr>
<tr>
<td>No of follicles ≥17 mm at day of trigger</td>
<td>8.4</td>
<td>10.2</td>
<td>6.1</td>
<td>0.025*</td>
</tr>
<tr>
<td>Progesterone(ng/ml)at day of trigger</td>
<td>1.81</td>
<td>1.15</td>
<td>1.73</td>
<td>0.011*</td>
</tr>
<tr>
<td>No. of oocytes retrieved</td>
<td>9</td>
<td>10.6</td>
<td>9.5</td>
<td>0.006*</td>
</tr>
<tr>
<td>No. of MII oocytes</td>
<td>7.3</td>
<td>9.1</td>
<td>6.3</td>
<td>0.001*</td>
</tr>
<tr>
<td>No. of transferred embryos</td>
<td>2.9</td>
<td>3</td>
<td>1.8</td>
<td>0.013*</td>
</tr>
</tbody>
</table>

*Significant at P<0.05
Discussion

The present study showed that suppression of FSH by luteal phase treatment by either oral estradiol and GnRH antagonist lead to significant increment in the recruited antral follicles, and significant reduction in their sizes and improve their growth symmetry in the early follicular phase. The extent of follicular size reduction was statistically significant more in antagonist than in estradiol group specially for antral follicles that measure 6-10 mm (P < 0.001). These findings agreed that reported by Fanchin et al, there was attenuation in the antral follicle size heterogeneity after administration of cetorexil or estradiol during the luteal phase, but there were no significant change in total no. of antral follicles after treatment with E2 or antagonist. Batool et al found significant reduction in the early antral follicles sizes after using estradiol or antagonist in luteal phase.

In the present study a significant reduction of day 2 serum FSH, LH, and progesterone levels after treatment, and the antagonist reduced FSH and progesterone more significantly than estradiol. Estradiol levels were significantly elevated within estradiol group, while in antagonist group there was significant reduction. Batool et al, also found significant reduction of FSH in early follicular phase in both estradiol and antagonist group but no difference found when compared the 2 groups. A significant elevation of E2 levels in estradiol group ,and it was insignificantly reduced in antagonist group. Similar findings reported by Blockeel et al.

In the current study, no significant difference among the three groups, regarding the gonadotrophin dose or length of stimulation period. Hong Ye et al and Cédrin-et al had same findings.

In the present study a significant increment in number of follicles that measured 15-16mm in antagonist group with good reduction in follicular growth discrepancies at day 8. At day of trigger the antagonist group had lower number of 11-14 mm, and 15-16mm follicles, and higher number of follicles ≥17 mm, when compared with other 2 groups. Fanchin et al stated that luteal FSH reduction by either estradiol or GnRH antagonist treatment improves the homogeneity of early antral follicles during the early follicular phase, an effect that persists during ovarian stimulation.

While Cédrin et al observed a significant lower number of medium-size follicles on day 6 of ovarian stimulation and a lower ratio of cycles had follicles more than 15 mm in women treated with E2 proposed a retarded in the initiation of follicular development.

In our study there no significant differences in estradiol levels at day of trigger between 3 groups, but there was significant elevated progesterone levels in group treated with estradiol. Also Hong Ye et al reported similar findings.

In the present study, antagonist group had significant higher number of oocytes retrieved and high number of mature oocytes. More, embryos transferred in estradiol
and antagonist than control, but the results between E2 group and antagonist group were not significant. It is worth mentioning that some patients in all groups had no embryo transfer due to different factors. The biochemical and clinical pregnancy rates were insignificantly different among the 3 groups. The HCG positive rates in estradiol group was 4/20 (20%), in GnRH antagonist group 7/20 (35%) and in control was 6/20 (30%). The clinical pregnancy rates were 4/20 (20%) in estradiol group, 6/20 (30%) in GnRH antagonist group, and 5/20 (25%) in controls. Cunha et al found no significant differences in the number of oocytes retrieved between group received luteal phase estradiol combined with GnRH antagonist, and control group. Nigel et al found no significant differences in the total and MII oocytes retrieved, or in the rates of biochemical and clinical pregnancy, between the group treated with E2 and that had COCP in luteal phase.

Conclusion

Premenstrual estradiol or GnRH antagonist treatment decrease size discrepancies of antral follicles, and improve synchronization of their growth. GnRH antagonist achieved that more significantly than estradiol. Higher total oocytes and MII retrieved in antagonist group, significant embryo transferred in both treatment groups.

Ethical Clearance: The study protocol approved by the Arab Board of Health Specialization for Obstetrics and Gynecology in Iraq. Informed signed consents obtained from all participants

Conflict of Interest: None

Funding: None

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Diagnostic Study on Intestinal Parasites Isolated from Raw Consumed Vegetables in Misan City/ Iraq

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¹Department of Clinical and Laboratory Science, College of Pharmacy, University of Misan, Iraq, ²Department of Basic Medical Science, College of Dentistry, University of Misan, Iraq.

Abstract

Objectives: It is well known that raw vegetables have an important role in human nutrition. And considered as an agent for transmission of intestinal parasites Therefore, the present study is designed to detect the parasite contamination in Misan city.

Method: A total of 45 fresh vegetables were randomly collected. All samples were examined according to standard methods for detection of protozoan cysts, oocysts, helminth eggs as well as larva.

Results: Intestinal parasites were detected in 23/45 (51.1%). The highest contaminated vegetable were celery (66.7%) followed by cress (46.7%) and lettuces (40%). Giardia lamblia cysts were the most prevalent (43.5%) followed by Fasciola hepatica eggs (34.7%), Entamoeba spp. cysts (26.1%), Hymenolepis nana eggs (17.4%), Cryptosporidium spp. oocysts (13.1%), Toxoplasma gondii oocysts (8.7%), Enterobius vermicularis eggs (8.7%) and Emeria spp.oocysts (3.4%).

Conclusions: These findings provide evidence for the high risk of acquiring parasitic infection from the consumption of raw vegetables in Misan city.

Keywords: Vegetables, Intestinal parasites, Celery, Cress, Lettuces, Misan.

Introduction

Leafy vegetables regarded as an important part of the healthy diet. In many countries such leafy plants are eaten raw and this practice may also favor the likelihood of foodborne parasitic infections ¹. In recent years, there has been an increase in the number of report cases of food-borne illnesses linked to consuming fresh vegetables. Parasitic diseases can be considered among the most common diseases on earth, transmitted to humans through water, soil, and foodstuffs ². Vegetables, especially salads, are an important route of transmission of intestinal source of food borne outbreaks in developing countries ³,⁴. In Iraq there are many epidemiological studies of the intestinal parasitic infections. In Naienawa province show the total percentage of the intestinal parasites was (70%) where including (19.5%) Entamoeba coli (3.11%) Entamoeba histolytica (11.9%) Giardia lamblia (19.5%) Hymenolepis nana (11.8%) Enterobius vermicularis (2.95%) Ascaris lumbricoides and (0.6%) Ancylostoma duodenale ⁴, in field study for intestinal parasites infection among Deiala city 6645 stool specimens were tested and revealed that total infection was 29.1% and many intestinal parasites were recorded such as E. histolytica (13.6%) , E coli (1%), G. lamblia (11.1%), H. nana (0.6%), E. vermicularis (1.9%) and A. lumbricoides (0.2%) ⁶.

Many studies had been conducted to evaluate the role of raw vegetables in the transmission of intestinal parasites, for example, in Iraq, Alexandria, Egypt; Tripoli, Libya; Riyadh, Saudi Arabia, Tehran and Qazvin Province, Iran; and the Philippines. All have stressed the importance of fruits and vegetables, particularly which are consumed raw and unwashed in the transmission of medically important parasites ⁵.

The aim of the present study was to know the prevalence of intestinal parasitic contamination in raw vegetables in Misan city and to explore the types of intestinal parasites in these vegetables.
Material and Method

Sample collection

Three types of green vegetables were selected in this study lettuce (*Lactuca sativa*), Celery (*Aplum graveolens*) and Cress (*Lepidium sativum*). A total of 45 samples (15 samples from each type of green vegetables) were purchased at the smallest retail size available. Samples were collected monthly and picked randomly from, supermarkets and street vendors in Misan city during October 2017–April 2018. 200 grams were being prepared from the edible part of each vegetable sample.

Procedure for sample preparation and washing

Fresh samples were collected randomly from Misan city. Each vegetable sample was placed in a separate nylon bag and labeled with a unique number and date of collection. Approximately 200 gm. of each vegetable was soaked (for fifteen minutes) in one liter of physiological saline, Vegetable sample was removed and the remaining wash solution was left for 12 hours for sedimentation. The top layer was discarded and the remaining wash solution was filtered through a sieve (425 um pore size) to remove large debris and then centrifuged at 2000 rpm for 15 min. The supernatant was decanted into another tube to be examined by flotation, and a few drops of the sediment were placed on glass slides and examined for parasites. The sediment was mixed and examined with (Simple smear, Iodine smear staining and Modified Zeihl–Neelsen stain).

Data Analysis

Statistical analyses were carried out using the chi-square. Differences among samples were considered to be statistically significant if p<0.05.

Results

The examination of vegetables collected from Misan city showed contamination of these vegetables with many types of parasites (eggs and cysts). The parasites were determined in 23/45 (51.1%) samples. The highest contaminated one was celery (66.7%) followed by cress (46.7%) , and lettuces ( 40%). Statistical analysis showed that there was no significant differences among the three studied types of vegetables.

The rate of contamination with mixed parasites (65.2%) was higher than the rate of contamination with single parasites (34.8%) (Table 1). There was no significant difference between single and mixed contamination (P>0.05).

*Giardia lamblia* cysts were the most prevalent (43.5%) followed by *Fasciola hepatica* eggs (34.7%), *Entamoeba* spp. cysts (26.1%), *Hymenolepis nana* eggs (17.4%), *Cryptosporidium* spp. oocysts (13.1%), *Toxoplasma gondii* oocysts (8.7%), *Enterobius vermicularis* eggs (8.7%) and *Emerica* spp.oocytes (3.4%).

<table>
<thead>
<tr>
<th>Type of vegetables</th>
<th>No. of examined samples</th>
<th>No. of contaminated vegetables (%)</th>
<th>Single contamination (%)</th>
<th>Mixed contamination (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lettuces</td>
<td>15</td>
<td>6 (40)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Cress</td>
<td>15</td>
<td>7 (46.7)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Celery</td>
<td>15</td>
<td>10 (66.7)</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>23 (51.1)</td>
<td>8 (34.8)</td>
<td>15 (65.2)</td>
</tr>
</tbody>
</table>
Table 2: The contamination of 23 out of 45 fresh leafy vegetables examined with parasitic stages in Misan city

<table>
<thead>
<tr>
<th>Type of parasites</th>
<th>Parasitic stage</th>
<th>contaminated vegetables (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giardia lamblia</td>
<td>cyst</td>
<td>10 (43.5)</td>
</tr>
<tr>
<td>Entameoba spp.</td>
<td>cyst</td>
<td>6 (26.1)</td>
</tr>
<tr>
<td>Toxoplasma gondii</td>
<td>oocyst</td>
<td>2 (8.7)</td>
</tr>
<tr>
<td>Enterobius vermicularis</td>
<td>egg</td>
<td>2 (8.7)</td>
</tr>
<tr>
<td>Fasciola hepatica</td>
<td>egg</td>
<td>8 (34.7)</td>
</tr>
<tr>
<td>Emeria spp.</td>
<td>oocyst</td>
<td>1 (3.4)</td>
</tr>
<tr>
<td>Hymenolepis nana</td>
<td>egg</td>
<td>4 (17.4)</td>
</tr>
<tr>
<td>Cryptosporidium spp.</td>
<td>oocyst</td>
<td>3 (13.1)</td>
</tr>
</tbody>
</table>

Discussion

Intestinal parasitic diseases are still a public health problem in the developing countries, more than two billion people are infected with intestinal parasites. It was clear from the results obtained from this study that percentage of contamination of vegetables with different intestinal parasites was (51.1%)(23) positive out of 45 samples were examined. This percentage considered close to results obtained by study 9 in Mosul which showed that 52% of vegetables were found contaminated with parasitic stages but less than what reported in retail markets in Tripoli, Libya (58%) 10 and higher than those in study 11 done in Saudi Arabia that appeared 76 out of 470 samples (%16.2) contained parasite stages. Results of study 12 have reported that the rate of parasitic contamination of vegetables was (31.7%) in Alexandria, Egypt.

These differences can be explained by the influence of environmental conditions, difference of the used techniques of investigations, the soil’s type, type of water used for irrigation, climatic conditions, geographical locations and sanitary habits 13.

In present study we found celery vegetables were highly contaminated with the parasitic stages than others, these results were similar to the findings of 14 that showed that the contamination with the parasitic agents was higher in celery, rocket and parsley, while was lower in leek, dill and cressa in Erbil and disagreement with 15. The highest percentage of contamination was detected in...
lettuce samples and Said in Egypt.

The rate of contamination by mixed parasites (65.2%) was higher than the rate of contamination by single parasites (34.8%) with significant differences between single and mixed contamination (P>0.05) and this agree nearly with that reported that among all examined fresh vegetable samples none of them had single parasitic contamination.

According to the results of this study we would like to aware the people in Misan city for the presence of many causatives of parasitic disease in vegetables in markets, and to avoid infection with these parasites, we would like to suggest the appropriate washing of vegetables with tap water for many times to remove all parasitic agents from the vegetables. Contamination of vegetables may occur in a variety of ways, such as from contact with soil, and from contact pre- and postharvest. In most cases, contamination is associated with the water used for irrigation.

Our study has isolated different types of parasitic stages from the vegetables. *Giardia lamblia* cyst was the most common parasite detected in the examined vegetables (43.5%) followed by *Fasciola hepatica* egg (34.7%), *Entamoeba* spp. cysts (26.1) *Hymenolepis nana* eggs (17.4%), *Cryptosporidium* spp. oocysts (13.1%), *Toxoplasma gondii* oocysts (8.7%), *Enterobius vermicularis* eggs (8.7%) and *Emeria* spp. Oocysts (3.4%). This is in agreement with several studies carried out in different parts in the world which detected different parasitic stages in vegetables, the study showed that *Entamoeba* spp. was the most common parasite detected in the examined vegetables 41(%25.30) followed by *Ascaris lumbricoides* 33 (%20.37), *Giardia lamblia* 28 (%17.28), *Fasciola hepatica* 26 (%16.04), *Trichuris trichiura* (%5.55), *Toxocara* spp. 7 (%4.32), *Taenia* spp. 7 (%4.32), *Hymenolepis nana* 6 (%3.70) and *Stronglyloides stercoralis* (%3.08) in Al-Nassiriyah city. in Kenya the intestinal parasites found on the vegetable samples include protozoa: *Entamoeba histolytica, Giardia lamblia* and *Balantidium coli* and helminthes: *Ascaris lumbricoides, Trichuris trichiura* and hook worms, while in Iran the parasites’ stages detected in the vegetables were *Giardia lamblia* cysts (7%), *Dicrocoelium* eggs (6%), *Fasciola* eggs (5%) and *Ascaris* eggs (2%).

Some studies indicated that agricultural use of untreated wastewater was the major cause of the increase in intestinal parasites. The use of sewage water plays also an important role in the epidemiology of transmission of parasitic diseases to human through consuming such vegetables.

### Conclusions

These findings provide evidence for the high risk of acquiring parasitic infection from the consumption of raw vegetables in Misan city, Iraq.

**Ethical Clearance:** This research article was done without using humans and animals.

**Source of Funding:** Taken from the Ministry of Higher Education and Scientific Research via University of Misan/ Iraq.

**Conflict of Interest:** The authors assure that this review article content has no conflicts of interest.

### References


Factors Affecting the Smoking Behavior of 17-25 Year-Old Teenagers in Urban Areas

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Introduction. Indonesia is one of low-income countries with smoking as its primary health problem. This problem also appears among women living in urban environments. Although Indonesian culture previously held smoking to be a taboo for Indonesian women, with the passing time, the number of female teen smokers has been growing.

Objective: The aim of this research was to analyze factors influencing the smoking behavior of urban females of 17–25 years of age. Method. This quantitative research employed a cross-sectional design. The population of this research includes urban females aged 17 to 25 years old. The sample used consisted of 35 respondents who were selected by the consecutive sampling technique. The independent variables of this research were environment (peer and family support), location, and psychological factor (stress). The dependent variable was smoking behavior. The whole data were analyzed using Spearman’s statistical test. Results. The research results show that the smoking behavior of females in their late adolescence was influenced by peer support (p = 0.026), family support (p = 0.038), and location (p = 0.003). The psychological factor, stress, did not affect the smoking behavior of females in their late adolescence (p = 0.133). Conclusion. Location was the dominant factor that influenced female adolescents’ smoking behavior (correlation coefficient = 0.482). It is expected that this research provides recommendations for preventing the increase in the number of female smokers, especially those living in urban environments.

Keywords: smoking behavior, female in late adolescence, peer, family, location, stress

Introduction

Tobacco consumption has caused the world’s smoking-induced mortality to increase significantly1. By 2030, 8 million people are predicted to die from smoking, with those in low- and medium-income countries accounting for the majority of the number2. Although being a developing country with smoking behavior as its main health problem—which has claimed over 200,000 lives every year—Indonesia becomes the only country within the Asia-Pacific region that has yet to sign the WHO Framework Convention on Tobacco Control3. Developing countries consume tobacco at a rate of 2.7% per year, while the tobacco consumption rate of developed countries has decreased to 1.8% per year4.

Some 90% of smokers are 18 years of age, and 99% of all cigarette addicts are about 265. A previous study estimated that every day, 3,000 to 5,000 teens try smoking for the first time in their lives6. Both female and male smokers engage in this high-risk behavior7 low leisure-time physical activity, low fruits/vegetables intake, and high alcohol consumption, with 250 million females worldwide having been smoking, most of whom being citizens of low-income countries8. Consequently, 1.5 million females die from smoking tobacco annually9.

Traditionally, Indonesian women do not smoke. However, there is a rising trend of smoking among women in cities as a consequence of cigarette ads, promotion, and sponsorship as well as influence from peers to smoke10. A fair number of women in urban environments have a tendency of smoking as a way of relieving stress and relaxation11.

The effect of smoking on health in women is stronger than in men. Female smokers’ lungs are more...
susceptible to COPD (chronic obstructive pulmonary disease) than male smokers\textsuperscript{12,13}. Not only are they prone to such general health problems as heart disease, cancer, hypertension, and diabetes mellitus, women are also at a high risk of problems men are unaffected by such as pregnancy issue and certain cancers like cervix cancer\textsuperscript{14}.

Smoking behavior in youths today has become a common phenomenon we can encounter at any time. Not only men, we can now readily find smoking young women in public areas such as cafés, malls or department stores, recreational places, to name but few. Previously, smoking in women was considered to be a deviance\textsuperscript{15}. Earlier findings also indicate that women who smoked in the past experienced stigma from society\textsuperscript{16}. This research aimed to analyze the factors influencing the smoking behavior of female adolescents in urban environments.

Method

2.1 Research Design and Sample

This research is quantitative research with a cross-sectional design\textsuperscript{17,18}. Because this research used a small sample size (less than 100), the sample was selected by a convenience sampling technique. The research sample of 35 respondents, consisted of females in the age range of 17 to 25 years who lived in the City of Surabaya, Indonesia.

2.2 Research Variables and Instruments

The independent variables in this research included peers, family, psychological factor, and age. The dependent variable was the smoking behavior in females who were in their late adolescence. Data were collected using research instruments in the form of questionnaires which previously were subjected to validity and reliability testing. The questionnaires were intended to figure out the factors causing smoking behavior, including, peer support, family support, location, and psychological factor (stress), as well as the smoking behavior itself.

2.3 Data Processing

After all the needed data were collected, data processing was conducted. The data processing began with editing, in which all questions were rechecked for completion, followed by scoring, in which every answer was scored. The data were encoded for the ease of the data processing that was aided by the SPSS program for Windows through the final stage. The data were analyzed using univariate and bivariate analyses. These analyses were followed by Spearman’s rho calculation.

RESULTS

There were 35 respondents representing a population of urban young woman smokers in this research. The characteristics of the respondents are presented in detail in the following table.

Table 1. Frequency and percentage distribution of socio-demographic characteristics of the participants (n = 35)

<table>
<thead>
<tr>
<th>Sample Characteristic</th>
<th>Female Smoker, N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>3 (8.6)</td>
</tr>
<tr>
<td>Student</td>
<td>21 (60.0)</td>
</tr>
<tr>
<td>Private employee</td>
<td>7 (20.0)</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>1 (2.9)</td>
</tr>
<tr>
<td>Part-timer</td>
<td>3 (8.6)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Senior high school</td>
<td>23 (65.7)</td>
</tr>
<tr>
<td>Higher education</td>
<td>12 (34.3)</td>
</tr>
<tr>
<td>Age at which respondents came into contact with cigarette</td>
<td></td>
</tr>
<tr>
<td>Childhood (5–11 years old)</td>
<td>6 (17.1)</td>
</tr>
<tr>
<td>Early adolescence (12–16 years old)</td>
<td>12 (34.3)</td>
</tr>
<tr>
<td>Late adolescence (17–25 years old)</td>
<td>17 (48.6)</td>
</tr>
</tbody>
</table>

In the occupation category, 60% of the respondents were students, 20% private employees, 2.9% entrepreneurs, 8.6% part-timers, and the rest unemployed. These respondents were later re-categorized into two: 65.7% were graduates of senior high schools, and 34.3% graduates of higher education institutions. Out of all respondents, 48.6% knew cigarette since the ages of 17–25 years (late adolescence), 34.3% since the ages of 12–16 years (early adolescence), and the remaining 6% since the ages of 5–11 (childhood). An analysis of the factors influencing the smoking behavior of females in late adolescence was then conducted based on those characteristics.
Table 2. Relationship between peer support and the smoking behavior of females aged 17–25 years in urban environments

<table>
<thead>
<tr>
<th>Peers</th>
<th>Smoking Behavior</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Light</td>
<td>Moderate</td>
<td>Heavy</td>
<td>Total</td>
</tr>
<tr>
<td>Non-supportive</td>
<td>3 (8.6%)</td>
<td>0</td>
<td>0</td>
<td>3 (8.6%)</td>
</tr>
<tr>
<td>Supportive</td>
<td>9 (25.7%)</td>
<td>16 (45.7%)</td>
<td>7 (20.0%)</td>
<td>32 (91.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>12 (34.3%)</td>
<td>16 (45.7%)</td>
<td>7 (20.0%)</td>
<td>35 (100%)</td>
</tr>
</tbody>
</table>

Correlation coefficient = 0.377; p = 0.026

According to Table 2, all moderate and heavy smokers stated that the smoking behavior of their peers had an effect on their own. Three respondents (8.6%) who stated that the smoking behavior of their peers did not affect their own smoking behavior were all engaged in light smoking behavior.

Out of the 32 respondents who stated that their peers supported their smoking behavior, a majority revealed that they had smoking friends and were once offered cigarette. The Spearman’s test yielded a p value of 0.026 (p < 0.05), meaning that peer support had a significant effect on smoking behavior. The correlation coefficient was 0.377, which was below 0.40. This value indicates that peer support and smoking behavior of females in late adolescence was related at a low level of correlation. The positive mark of the correlation coefficient shows that there was a positive relationship between peer support and smoking behavior.

Table 3. Relationship between family support and the smoking behavior of females aged 17–25 years in urban environments

<table>
<thead>
<tr>
<th>Family</th>
<th>Smoking Behavior</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
<td>Severe</td>
<td>Total</td>
</tr>
<tr>
<td>Non-supportive</td>
<td>5 (14.3%)</td>
<td>0</td>
<td>1 (2.9%)</td>
<td>6 (17.1%)</td>
</tr>
<tr>
<td>Supportive</td>
<td>7 (20.0%)</td>
<td>16 (45.7%)</td>
<td>6 (17.1%)</td>
<td>29 (82.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>12 (34.3%)</td>
<td>16 (45.7%)</td>
<td>7 (20.0%)</td>
<td>35 (100%)</td>
</tr>
</tbody>
</table>

Correlation coefficient = 0.353; p = 0.038

Table 3 indicates that the number of severe smokers who received influence from their families was higher than that of severe smokers without the influence of their families. The Spearman’s statistical test yielded a p value of 0.038, meaning that there was a significant relationship. The correlation coefficient obtained was 0.353, suggesting that the relationship was positive. A correlation coefficient that was below 0.40 indicates that the correlation between family support and the smoking behavior of females in late behavior was low.
Table 4. Relationship between location and the smoking behavior of females aged 17–25 years in urban environments

| Location       | Smoking Behavior |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | Total     |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                | Light            | Moderate | Heavy    |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Private        | 5 (14.3%)        | 0        | 0        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Heterogeneous  | 6 (17.1%)        | 16 (45.7%)| 5 (14.3%)|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Homogeneous    | 1 (2.9%)         | 0        | 2 (5.7%) |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Total          | 12 (34.3%)       | 16 (45.7%)| 7 (20.0%)|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |

Correlation coefficient = 0.482; p = 0.003

Table 4 shows that 16 moderate smokers preferred smoking in heterogeneous places. Only 3 respondents (8.6%) did in homogeneous places such as smoking areas. This is due to the society’s lack of awareness of the effect that can be inflicted on passive smokers. The society tended to be ignorant of the surrounding. As many as 7 heavy smokers smoked in heterogeneous or homogeneous places. These results show that location had a significant effect on smoking behavior at a p value of less than 0.05 (p = 0.03). It was found that there was indeed a relationship between the two variables, location and the smoking behavior of females in late adolescence. The correlation coefficient of more than 0.40 indicates that the correlation between location and the smoking behavior of females in late adolescence was moderate.

Table 5. Relationship between stress and the smoking behavior of females aged 17–25 in urban environments

| Stress   | Smoking Behavior |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | Total     |
|----------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|          | Light            | Moderate | Heavy    |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Mild     | 8 (22.9%)        | 2 (5.7%) | 0        |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | 10 (28.6%)|
| Moderate | 0                | 9 (25.7%)| 6 (17.1%)|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | 15 (42.9%)|
| Severe   | 4 (11.4%)        | 5 (14.3%)| 1 (2.9%) |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | 10 (28.6%)|
| Total    | 12 (34.3%)       | 16 (45.7%)| 7 (20.0%)|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          | 35 (100%) |

Correlation coefficient = 0.273; p = 0.113

Table 5 indicates a p value of 0.113 (p > 0.05), meaning that psychological factor (stress) did not significantly influence the respondents’ smoking behavior. Eight respondents (22.8) were under a severe stress condition, yet such psychological condition did not drive them to be heavy smokers. This shows that stress level is not always directly proportional to the level of cigarette consumption.

**Discussion**

Through interactions, adolescents can share their feelings, problems, and thoughts with their peers. They have higher confidence in their peers than in their family. Behaviors and attitudes in adolescents and young adults are strongly influenced by peers and family, either directly or indirectly and attitude may influence young people to initiate smoking. The aims of this study were to 1. This behavior is assumed to be the function of the belief, while the belief determines the presence or absence of factors that facilitate or hinder performance, hence the formation of the behavior.
On average, female adolescents started smoking around the age of 20\textsuperscript{11}. The desire is stronger in more popular female adolescents than the lesser ones\textsuperscript{22}. Everyone in a popular female adolescents group is expected to be on par with the rest of the group. Consequently, one will befriend another who shares smoking behavior with them. This is the very reason why teens are selective when choosing friends\textsuperscript{1994-1996} (46.6% female, mean age at outset=15.4 years).

This study also shows that peer support and family support improved the smoking behavior of females in their late adolescence. The two factors were also responsible for the increase in the severity of cigarette addiction of females in late adolescence as was revealed by several earlier studies\textsuperscript{24,25}. This study reveals that those who engage in smoking behavior had latest education at senior high school level. Females of higher education, in this case those with Bachelor’s degree or above, preferred not to smoke out of their take that smoking is a negative behavior\textsuperscript{26}.

Family support was measured based on the smoking actions of family members (parents or siblings) that might support the respondents’ decision to smoke. Most respondents in this study had smoking family members (father or siblings). This caused the family members to be unable to prohibit the respondents from smoking. Smoking parents mostly would increase the possibility of their teen children to smoke\textsuperscript{27}.

Location was also related to peer influence on smoking behavior. This research’s results are in line with those of previous research, which states that community or location is one of the factors causing the development of smoking behavior\textsuperscript{28}. To smoking females, private or quiet places such as toilets are highly preferable for smoking\textsuperscript{29}. This is related also to females’ hangout and favorite spots.

**Conclusion**

Many factors might influence the smoking behavior of females aged 17–25 in urban environments. Support from parents and peers had an effect on the smoking behavior of females in late adolescence. Yet location was the dominant factor that influenced their smoking behavior. Meanwhile, stress as a psychological factor did not have any influence on their smoking behavior.

**Ethical Clearance:** This research has obtained an ethical clearance numbered 329-KEPK from the Faculty of Public Health, Universitas Airlannga, Surabaya, Indonesia.

**Conflict of Interest:** None declared

**Source of Funding:** This study is done with individual funding.

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Effectiveness of the Otaria’s Postpartum Gymnastic Model and Caregiver Assistance on Decreasing of Uterine Fundal Height in Postpartum Mothers

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¹Department of Midwifery, Health Polytechnic of Jakarta I, Indonesia, ²Department of Midwifery, Health Polytechnic of Tanjung Karang, Indonesia, ³Department of Midwifery, Health Polytechnic of Jakarta III, Indonesia, ⁴Department of Nutrition, Health Polytechnic of Bandung, Indonesia, ⁵Center for Research and Development of Public Health Efforts, Indonesia

Abstract

Postpartum gymnastic is one of the efforts to restore the postpartum mother’s womb, therefore the development of postpartum gymnastic to get an effective gymnastic model is still needed. The purpose of this study was to assess the effectiveness of the Otaria postpartum gymnastic model and caregiver assistance to reduce of postpartum maternal uterine fundal height, using matching pretest-posttest with control group, involved 160 postpartum maternal. The final results based on the General Linear Model-Repeated Measures (GLM-RM) for the difference (Δ) between of uterine height in the intervention group and the control group showed that a very significant difference occurred on the 6th day to the 7th day postpartum with a difference of 1.65 cm (p<0.05). Conclusion, that by implementing Otaria’s postpartum gymnastic model and caregiver assistance, the uterine height will return to its normal form on the 7th day postpartum.

Keywords: Postpartum, Gymnastic, Caregiver, Uterine Fundal Height

Introduction

The maternal mortality rate has decreased since 2002 at 307 per 100,000 live births, and in 2008 it was 228 per 100,000 live births, but the MMR increased again in 2012 to 359 per 100,000 live births. Based on the evaluation of the Millennium Development Goals (MDGs) in 2015, cases of maternal deaths in Indonesia are still 305 per 100,000 live births, even though the target set by the United Nations is 102 per 100,000 live births, the program has not been implemented properly so that the program is currently being continued through Sustainable Developments Goals (SDGs) with the target is to reduce maternal mortality to below 70 per 100,000 live births by 2030.¹ The cause of maternal death in Indonesia is still dominated by bleeding, namely 32%, hypertension 25%, followed by 5% infection, 5% prolonged labor and 1% abortion. One of the causes of the bleeding is uterine atony.²

Uterine involution is the process of the uterus returning to the condition before pregnancy. Uterine involution in postpartum mothers must return well, so that there is no uterine sub involution or delayed uterine return to normal size which caused bleeding, and occurs diastasis recti abdominis or separation of the right and left side of the rectus abdominis.³ To restore reproductive organs, postpartum mothers need effective postpartum care, including early mobilization and exercise. Contraction of the abdominal muscles will help the process of uterine involution, with ambulation as soon as possible and frequency is often very necessary in the process of uterine involution,⁴ (there was relationship between early mobilization and involution). The results of similar the study in Lampung showed that the factors associated with a decreased in uterine fundal height in postpartum mothers were early mobilization.⁵

The cause of diastasis recti is the softening of the ligament due to hormones resulting in very
rapid stretching of the abdominal wall due to uterine enlargement.\(^6\) The results of the study on the application of transversus abdominis muscle strengthening exercises in postpartum mothers have a significant relationship with a high decrease in uterine.\(^7\)

South Jakarta Health Center has the highest number in performing postpartum services by health workers, which is 35,588/year. South Jakarta is ranked the second highest in capital city of Jakarta, which is 38,832.\(^8\) Whereas in Lampung Province there are 115 Public Health Center units inpatient care and 85 units (73.9%) there are basic essential obstetric neonatal health service center.\(^9\)

The purpose of this study is assessing the effectiveness of the Otaria postpartum gymnastic model and caregiver assistance to decrease in the height of the uterine fundal in postpartum mothers.

**Method**

The study design was matching pretest-posttest with control group. The population was all postpartum mothers who gave birth in health centers of South Jakarta and Bandar Lampung. The intervention group were 80 postpartum mothers who gave birth at Pasar Minggu Health Center, South Jakarta and Kota Karang Health Center, Bandar Lampung. They were treated with the Otaria’s postpartum gymnastic model from 1\(^{st}\) day to 10\(^{th}\) day. The control group were 80 postpartum mothers who gave birth at Jagakarsa Health Center, South Jakarta and Kemiling Health Center, Bandar Lampung. They were treated with early mobilization. Sample restriction: the age of the mother during childbirth 20-35 years. Matching samples: multiparous mothers 2 and or 3, normal BMI values (18.5-22.9), normal Hb (11-12 gr/dL). Inclusion criteria: postpartum mothers who gave birth normally, did not experience labor complications, gestational age \(\geq\) 37 weeks, were born alive, by informed consent. A sample size of 160 people, calculated using the sample size formula with 95% of CI, 80% of power,\(^10\) selected by accidental sampling. Data was collected in May to October 2018, then analyzed by GLM-RM.

**Results**

Table 1 shows that based on measurements in centimeters unit the average value of uterine fundal height in the intervention group was lower than the control group and it’s began to occur on day 3 to day 7 and it was not palpable on the 8\(^{th}\) day. Whereas in the control group until the 10\(^{th}\) day the average of uterine fundal height was still as high as 1.01 cm.

**Table 1. Data of uterine fundal height Based on Postpartum Time Period**

<table>
<thead>
<tr>
<th>Group</th>
<th>Postpartum Period</th>
<th>Frequency</th>
<th>Centimeter Unit</th>
<th>Finger Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Range</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Intervention</td>
<td>2 hours</td>
<td>80</td>
<td>15.18</td>
<td>13-17</td>
</tr>
<tr>
<td></td>
<td>6 hours</td>
<td>80</td>
<td>14.68</td>
<td>12-16</td>
</tr>
<tr>
<td></td>
<td>24 hours</td>
<td>80</td>
<td>13.76</td>
<td>10-16</td>
</tr>
<tr>
<td></td>
<td>2(^{nd}) day</td>
<td>80</td>
<td>12.44</td>
<td>7-15</td>
</tr>
<tr>
<td></td>
<td>3(^{rd}) day</td>
<td>80</td>
<td>10.84</td>
<td>5-14</td>
</tr>
<tr>
<td></td>
<td>4(^{th}) day</td>
<td>80</td>
<td>8.58</td>
<td>3-13</td>
</tr>
<tr>
<td></td>
<td>5(^{th}) day</td>
<td>80</td>
<td>6.09</td>
<td>0-11</td>
</tr>
<tr>
<td></td>
<td>6(^{th}) day</td>
<td>80</td>
<td>3.55</td>
<td>0-7</td>
</tr>
<tr>
<td></td>
<td>7(^{th}) day</td>
<td>80</td>
<td>0.32</td>
<td>0-3</td>
</tr>
<tr>
<td></td>
<td>8(^{th}) day</td>
<td>80</td>
<td>0.00</td>
<td>0-0</td>
</tr>
<tr>
<td></td>
<td>9(^{th}) day</td>
<td>80</td>
<td>0.00</td>
<td>0-0</td>
</tr>
<tr>
<td></td>
<td>10(^{th}) day</td>
<td>80</td>
<td>0.00</td>
<td>0-0</td>
</tr>
<tr>
<td>Control</td>
<td>2 hours</td>
<td>80</td>
<td>14.81</td>
<td>12-17</td>
</tr>
<tr>
<td></td>
<td>6 hours</td>
<td>80</td>
<td>14.16</td>
<td>10-17</td>
</tr>
<tr>
<td></td>
<td>24 hours</td>
<td>80</td>
<td>13.49</td>
<td>9-15</td>
</tr>
</tbody>
</table>
Table 1. Data of uterine fundal height Based on Postpartum Time Period

<table>
<thead>
<tr>
<th>Group</th>
<th>Postpartum Period</th>
<th>Frequency</th>
<th>Centimeter Unit</th>
<th>Finger Unit</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Range Min</td>
<td>Range Max</td>
</tr>
<tr>
<td>2nd day</td>
<td>80</td>
<td>11.76</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>3rd day</td>
<td>80</td>
<td>11.33</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>4th day</td>
<td>80</td>
<td>9.70</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>5th day</td>
<td>80</td>
<td>8.30</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>6th day</td>
<td>80</td>
<td>5.51</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>7th day</td>
<td>80</td>
<td>3.94</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>8th day</td>
<td>80</td>
<td>3.00</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>9th day</td>
<td>80</td>
<td>1.81</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10th day</td>
<td>80</td>
<td>1.01</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2, it appears that the average of difference of uterine fundal height reduction based on measurements in centimeters in the intervention group was greater than the control group began to occur in the period of the 3rd day to the 10th days postpartum.

Table 2. The Difference of Decrease of Uterine Fundal Height Based on Period of Postpartum

Table 3, the results of the independent samples statistical analysis of delta difference T-Test decreases based on centimeter measurement showed that there was a significant difference (p<0.05) the mean of delta decrease in uterine height in the intervention group was greater than the control group on the 3rd day to 7th days. Whereas in the measurement of the first 6 hours postpartum, 24 hours and the 2nd day, there was no significant difference (p> 0.05).

Table 3. Difference of Decreasing of Uterine Fundal Height

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Frequency</th>
<th>Mean Diff and Standard Deviation Value Group</th>
<th>Value of t Count</th>
<th>Probability</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours</td>
<td>80</td>
<td>Intervention: 0.50 (± 0.60) Control: 0.65 (± 0.89)</td>
<td>-1.26</td>
<td>0.21</td>
<td>No difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 hours</td>
<td>80</td>
<td>Intervention: 1.48 (± 0.91) Control: 1.36 (± 1.15)</td>
<td>0.69</td>
<td>0.49</td>
<td>No difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd day</td>
<td>80</td>
<td>Intervention: 2.73 (± 1.61) Control: 3.06 (± 1.28)</td>
<td>-1.47</td>
<td>0.14</td>
<td>No difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd day</td>
<td>80</td>
<td>Intervention: 4.34 (± 2.02) Control: 3.49 (± 1.29)</td>
<td>3.18</td>
<td>0.00</td>
<td>There is a difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th day</td>
<td>80</td>
<td>Intervention: 6.59 (± 2.30) Control: 5.11 (± 1.18)</td>
<td>5.11</td>
<td>0.00</td>
<td>There is a difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th day</td>
<td>80</td>
<td>Intervention: 9.10 (± 2.97) Control: 6.51 (± 1.32)</td>
<td>7.14</td>
<td>0.00</td>
<td>There is a difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th day</td>
<td>80</td>
<td>Intervention: 11.65 (± 2.49) Control: 9.30 (± 2.95)</td>
<td>5.46</td>
<td>0.00</td>
<td>There is a difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7th day</td>
<td>80</td>
<td>Intervention: 14.88 (± 4.31) Control: 10.88 (± 1.27)</td>
<td>21.87</td>
<td>0.00</td>
<td>There is a difference</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4, results of the independent samples median statistical analysis of the delta difference based on finger measurements showed that there was a significant difference ($p<0.05$) that the decrease in uterine fundal height in the intervention group was greater than the control group occurred on the 3rd day to 6th days. Whereas in the first 6 hours postpartum, 24 hours, 2nd day and 7th day there were no significant differences ($p>0.05$).

**Table 4. Difference Statistic Test of Decreasing in Uterine Fundal Height Based on Finger Measurement**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Frequency</th>
<th>$\alpha = 0.05$</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours</td>
<td>80</td>
<td>1.00</td>
<td>No difference</td>
</tr>
<tr>
<td>24 hours</td>
<td>80</td>
<td>0.08</td>
<td>No difference</td>
</tr>
<tr>
<td>2nd day</td>
<td>80</td>
<td>0.85</td>
<td>No difference</td>
</tr>
<tr>
<td>3rd day</td>
<td>80</td>
<td>0.01</td>
<td>There is a difference</td>
</tr>
<tr>
<td>4th day</td>
<td>80</td>
<td>1.00</td>
<td>No difference</td>
</tr>
<tr>
<td>5th day</td>
<td>80</td>
<td>0.01</td>
<td>There is a difference</td>
</tr>
<tr>
<td>6th day</td>
<td>80</td>
<td>0.00</td>
<td>There is a difference</td>
</tr>
<tr>
<td>7th day</td>
<td>80</td>
<td>0.28</td>
<td>No difference</td>
</tr>
</tbody>
</table>

Table 5 show that the average difference in the decreased in uterine fundal height in the intervention group compared to the very significant control group occurred on the 6th day to the 7th day postpartum with a difference of 1.65 cm.

**Table 5. The Final Results**

<table>
<thead>
<tr>
<th>Delta</th>
<th>Measurement Time</th>
<th>Intervention</th>
<th>Control</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 vs Level 2</td>
<td>2 hours vs 6 hours</td>
<td>0.50</td>
<td>0.65</td>
<td>-0.50</td>
</tr>
<tr>
<td>Level 2 vs Level 3</td>
<td>6 hours vs 1st day</td>
<td>0.92</td>
<td>0.67</td>
<td>0.24</td>
</tr>
<tr>
<td>Level 3 vs Level 4</td>
<td>1st day vs 2nd day</td>
<td>1.32</td>
<td>1.73</td>
<td>-0.40</td>
</tr>
<tr>
<td>Level 4 vs Level 5</td>
<td>2nd day vs 3rd day</td>
<td>1.60</td>
<td>0.44</td>
<td>1.16</td>
</tr>
<tr>
<td>Level 5 vs Level 6</td>
<td>3rd day vs 3rd day</td>
<td>2.26</td>
<td>1.63</td>
<td>0.64</td>
</tr>
<tr>
<td>Level 6 vs Level 7</td>
<td>4th day vs 5th day</td>
<td>2.48</td>
<td>1.40</td>
<td>1.08</td>
</tr>
<tr>
<td>Level 7 vs Level 8</td>
<td>5th day vs 6th day</td>
<td>2.54</td>
<td>2.79</td>
<td>-0.24</td>
</tr>
<tr>
<td>Level 8 vs Level 9</td>
<td>6th days vs 7th day</td>
<td>3.23</td>
<td>1.58</td>
<td>1.65</td>
</tr>
</tbody>
</table>

**Discussion**

Based on centimeter unit measurements, the average of fundal height reduction of intervention group is faster than control group. This is in line with the opinion of Kenneth, that the process of decreasing uterine fundal height was fast if on the 3rd day the uterine fundal height was >3 fingers below the center. On the third to fourth day uterine fundal height was 2 cm below umbilicus, on the fifth to the seventh day uterine fundal height was half the symphysis, and on the tenth day the uterine fundal
height was not palpable. Immediately, after removal of the placenta the fundal drops 1-2 cm every 24 hours and after 6 days the fundal will be between the symphysis pubis and the umbilicus.\(^{(11)}\)

Based on measurements in the fingers unit it appears that the intervention fundal height was lower than the control group began to occur on the 5\(^{th}\), 6\(^{th}\), 7\(^{th}\), and on the 8\(^{th}\) day all were not palpable. Whereas in the uterine fundal height control group on the 9\(^{th}\) and 10\(^{th}\) day some were still half finger high.

The results of research in Kupang, measurement of day 2 uterine height there were 38 respondents (86%) experienced a decrease of 3 fingers below the center in mothers with primiparous age <35 years, there was a relationship between mobilization early with a decreased in uterine height where mothers who did early mobilization did not experience sub involution or failure in uterine involution.\(^{(12)}\)

Based on delta analysis, the average decreased in uterine height based on centimeter showed that the average decreased in uterine height in the intervention group was greater than that of the control group, starting at the 3\(^{rd}\) to 10\(^{th}\) day. The biggest difference in the decrease in uterine height in the intervention group compared to the control group occurred at the time period of the 7\(^{th}\) day postpartum with a difference of 4 cm.

After labor, the abdominal wall is loose because it is stretched for so long, but usually recovers within 6 weeks. Exercises carried out on certain muscles will give effect to increased muscle blood flow so that the transport of oxygen and other nutrients to the muscles also increases, this will give maximum strength to the muscles.\(^{(13)}\)

Otaria puerperal exercise carried out from the first 2 hours, 6 hours and 24 hours postpartum as initial mobilization and continued until 7 days postpartum. With early mobilization the mother will be more active in moving so that it will accelerate the process of involution of uterine devices, expedite the release of lockhea, and increase the smooth circulation of blood.\(^{(14)}\) A study found that there was a difference in the decrease in uterine fundus height between groups who performed a combination of abdominal and pelvic muscle exercises with a group that only performed pelvic floor muscle exercises.\(^{(15)}\) A Quasi-Experimental revealed that there were significant differences between pre-intervention and post-interventional scores of uterine involution in the experimental group and controls among postnatal mothers with p-value<0.05.\(^{(16)}\)

Strengthening the transversus abdominis muscle is an exercise by providing a stimulus to the part by contracting so that it can increase intra-abdominal pressure. The benefit of strengthening the transversus abdominis muscle is to tighten the uterine wall, accelerate uterine involution and facilitate the removal of lockhea.

**Conclusion**

The results of this study concluded that by implementing Otaria’s postpartum gymnastic model and caregiver assistance, the uterine involution process and/or High Uterine returned to its original form as before pregnancy occurred on the seventh day postpartum.

**Conflict of Interest, Funding and Ethical Clearance**

**Conflict of Interest:** No

**Source of Funding:** Authors

**Ethical Clearance:** No.226/EC/KEP/TJK/VII/2018 from Health Polytechnic of Tanjungkarang.

**References**


Problem-Based Learning Strategy based on Cognitive Style to Improve the Learning Outcomes of Nursing Students

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1Postgraduate Student, Department of Learning Technology, Malang State University / Health Polytechnic of RS dr. Soepraen of Malang, 2Department of Learning Technology, Malang State University, 3Department of Nursing, Health Polytechnic of Malang

Abstract

Problem-based learning (PBL) are very effective in nursing schools, because nursing students will face problems when they provide nursing care. Important problems that often occur in learning activities are learning outcomes. One of the characteristics of students that is important to understand and think about by lecturers is cognitive style. This study discusses PBL learning strategy and cognitive styles on learning outcomes in the nursing diploma III program, using a quasi-experimental design. The results: (1) there were significant differences in the learning outcomes of understanding basic nursing concepts between PBL group and DI group, (2) there were significant differences in understanding concepts between FI group and FD group, (3) there was an interaction between PBL learning strategies and strategies for learning with cognitive styles FI and FD. Thus PBL has advantages over DI in achieving learning outcomes understanding concepts depends on cognitive style. Educational institutions are expected to make policy policies to improve the quality of learning, especially in developing student-centered learning strategies.

Keywords: Problem based learning, Cognitive style, Learning outcomes.

Introduction

The progress of management of health personnel education in various levels and types will greatly determine the quality of health workers who are graduated. Therefore, the belief in the importance of advancing the process of education of health personnel must be truly considered important by the managers of educational institutions. Learning strategies are basic in efforts to help students in learning activities to achieve learning. Thus, teachers can use teaching materials as learning media. Learning strategies are a series of materials and learning procedures that are used together to obtain student learning outcomes.

The use of learning strategies that are lacking or inappropriate, which does not involve students playing an active role will influence student learning outcomes. The low student learning outcomes will have an impact on the decline in the quality of students in mastering the competencies of the subjects that must be mastered. This situation will lead to the low quality of graduates produced by these universities. Important problems and often faced in learning activities are the resulting incompatibility of learning outcomes as stated in the learning objectives. Understanding the character of the content of the subject matter, the character of students, and also the learning process is a determinant of success in learning. Bloom (1976) describes the relationship between student characteristics and the quality of learning and learning outcomes. Increasing the quality of learning and the ability of students to learn science in an effective and efficient way is influenced by the use of appropriate learning strategies.

PBL is a learning process that starts from real problems in life, based on a problem students are stimulated to learn problems based on the knowledge and experience previously possessed by students. This will make them have new knowledge and experience. PBL
learning strategies are very effective to use in nursing schools, because nursing students will be faced with problems when they provide nursing care and students are then required to solve the problem.

Comparison of PBL strategies in this study is used direct instruction strategy (direct learning). This learning strategy is a learning strategy that is actually teacher centered. This strategy according to the researcher is a strategy that can be used because it is in accordance with basic declarative nursing learning and procedural knowledge.

The purpose of this study is to test and analyze: 1) the presence or absence of differences in the learning outcomes of understanding basic nursing concepts between groups of students who learn to use PBL learning strategies with DI. 2) there is a difference in the learning outcomes of conceptual understanding between groups of students who have a cognitive style FI with FD. 3) whether there is an interaction between PBL and DI learning strategies with cognitive styles FI and FD on the learning outcomes of understanding the basic concepts of nursing of students.

### Materials and Method

This quasi-experimental research involved 129 nursing students who divided into experiment and control group, selected by cluster sampling technique. To determine the treatment class differently, random assignment was done. The design used in this study was factorial design (2x2). The experimental class studied using PBL learning strategy, and the control class using the DI learning strategy. The moderator variable was cognitive style, namely: field dependence and field independence. The dependent variable was learning outcomes (understanding and application of concepts). The variables that need to be controlled were the ability of lecturers, learning facilities and learning time. The research instrument were: GEFT cognitive style test and learning outcomes test. The data was analyzed by MANOVA (Multivariate Analysis of Variance).

### Findings

The understanding the concept obtained by the price of F=70.829 with a significance value of 0.000 (there was significant differences in understanding basic nursing concepts between groups of students who learn to use PBL strategy and DI strategy.

### Table 1. The Results of MANOVA I

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Pillai’s Trace</td>
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<td>19488.374a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>0.003</td>
<td>19488.374a</td>
<td>2.000</td>
<td>124.000</td>
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<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>314.329</td>
<td>19488.374a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>314.329</td>
<td>19488.374a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td>Learning Strategy</td>
<td>Pillai’s Trace</td>
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<td>37.329a</td>
<td>2.000</td>
<td>124.000</td>
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<tr>
<td></td>
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<td>37.329a</td>
<td>2.000</td>
<td>124.000</td>
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<tr>
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<td>37.329a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>0.602</td>
<td>37.329a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td>Cognitive Style</td>
<td>Pillai’s Trace</td>
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<td>37.983a</td>
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</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>0.620</td>
<td>37.983a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>0.613</td>
<td>37.983a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>0.613</td>
<td>37.983a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
<tr>
<td>Learning Strategy*Cogni-</td>
<td>Pillai’s Trace</td>
<td>0.074</td>
<td>4.983a</td>
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<tr>
<td></td>
<td>Wilks’ Lambda</td>
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<td>4.983a</td>
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<td>124.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>0.080</td>
<td>4.983a</td>
<td>2.000</td>
<td>124.000</td>
</tr>
</tbody>
</table>

Exact statistic
Design: Intercept+Learning-strategy+Cognitive-style+Learning-strategy*Cognitive-style

Table 2. The Results of MANOVA II

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected-Model</td>
<td>Learning outcomes understanding concepts (post test)</td>
<td>a 3474.119</td>
<td>3</td>
<td>1158.040</td>
<td>43.769</td>
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<td>Intercept</td>
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<td>618039.669</td>
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<tr>
<td>Learning-strategies</td>
<td>Learning outcomes understanding concepts (post test)</td>
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<tr>
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<td>1966.999</td>
<td>1</td>
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<td>74.344</td>
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<td>Learning outcomes understanding concepts (post test)</td>
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<td>0.870</td>
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<td>Total</td>
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<td>129</td>
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<tr>
<td>Corrected-Total</td>
<td>Learning outcomes understanding of concepts (post test)</td>
<td>6781.395</td>
<td>128</td>
<td></td>
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</tr>
</tbody>
</table>

R-Squared=0.512 (Adjusted R-Squared=0.501)

This can also be shown in terms of the estimated marginal means of understanding the concepts in both learning strategies (PBL and DI) as follows.

The mean-score of conceptual understanding of PBL group was higher than DI group. The F score for understanding basic nursing concepts based on cognitive style was 74.344 with p-value of 0.003 (there was a significant difference in understanding the concept between groups of students who have cognitive style FI and cognitive style FD.

This can also be shown in the form of an estimated marginal means of understanding the concepts based on cognitive style (FD and FI) as follows.

Figure 1. The estimated marginal means of understanding concepts in both learning strategies (PBL and DI)
It can be seen that the average value of the conceptual understanding of the student group had a relatively higher cognitive style FI than the average value of the student group that had the cognitive style of FD.

The results of calculating data to test hypotheses regarding the interaction between learning strategies and cognitive styles of students towards the ability to understand basic nursing concepts can be seen by looking at the calculated F scores and significance scores on the source learning strategy and cognitive style. Based on the table it is known that $F = 10.009$, with $p$-value $= 0.002$ (there was significant effect on the interaction between PBL learning strategies and DI learning strategies with the cognitive style of FI and FD).

This can also be shown in terms of the estimated marginal means of understanding basic student nursing concepts based on the interaction of learning strategies (PBL and DI) and cognitive styles (FI and FD).

By using PBL learning strategies, students are stimulated to learn so that conceptual understanding of the material is well achieved. The difference in learning outcomes between classes / groups of students learning using PBL learning strategies with DI shows that learning outcomes are influenced by learning strategies, even though students are given learning material and questions and the same facilities.

This is in line with Yudierawati’s research (2015) which states that there are differences in the learning achievement of nursing nursing clinical learning applications between learning and PBL strategies with direct learning strategies.

Some studies that show the effectiveness of PBL strategies in improving learning outcomes one of them is Oliveira et al (2016) which states that:

“The teaching strategies used and tested in the RCT with the aim of developing CT in undergraduate nursing students included PBL, the concept map, simulation, reflective writing, Role Modeling and Animated Pedagogical Agents. Furthermore, based on the meta-analysis of the studies included, the effectiveness of PBL was demonstrated in the increased overall CT scores"
from homogeneous studies. This result confirmed our hypothesis that the teaching strategies that show better efficacy in RCT are those that involve the use of active methodologies.

The results show that there are significant differences in the learning outcomes of conceptual understanding between groups of students who have cognitive styles and students who have cognitive style of FD. This shows that the ability to understand the concept of students who have a FI cognitive style is better than students who have a cognitive style of FD.

Woolfolk (1993) describes the definition of cognitive styles. Cognitive styles are about individuals to receive and organize information from the surrounding environment. Based on these opinions, it can be interpreted that what is meant by cognitive styles is the way a person processes, stores, or uses information to examine a task or interpret various types of environmental situations.

The results of this study are in line with the results of research from Udiyono, U. Research results from Hikmawati et al. (2013) also support that there is an influence of cognitive style on students’ mathematics learning outcomes. While the marginal mean of mathematics learning outcomes of students who have the FI cognitive style is better than the mathematics learning outcomes of students who have the FD cognitive style.

The success in the group of students who have the cognitive style FI, shows that students who have the cognitive style FI are strong analytical power (in response to the stimulus have a tendency to use their own perceptions and more analytical), more autonomous in concluding a conclusion, independent in working duty and confidence in his abilities because he has a high level of intellectuality and feels efficient when the task is done alone. A student with a cognitive style FD, finds difficulties in processing, but easily perceives when information is manipulated according to the context. He will be able to separate stimuli from the context.

The results of the calculation of data in order to test the hypothesis obtained the results that there is an interaction between PBL learning strategies and strategies of learning with the cognitive style FI and FD in understanding the concept of basic nursing students. The results of data calculations to test hypotheses about the interaction between learning strategies and cognitive styles of students towards the ability to understand basic nursing concepts can be known by looking at the calculated F scores and significance scores on the source learning strategy and cognitive style. Based on table 3, it is known that $F = 10.009$, with p-value of 0.002 (there was a significant effect on the interaction between PBL and DI strategy with the cognitive style of FI and FD).

The results of research that supports the results of this study are Shi, Changju (2011) which states that the results of the study show that cognitive style has a significant influence on the choice of learning strategies for students. Similarly, Suliani (2014) conducted a study on the effect of learning and cognitive style on students’ critical thinking skills in learning history. The results of the study obtained results that there is an influence of the interaction between learning strategies and cognitive styles on students’ critical thinking skills in learning history.

**Conclusion**

Based on the results of research and discussion, the conclusion of PBL learning strategies has advantages over DI learning strategies in achieving learning outcomes understanding concepts depends on the cognitive style possessed by students.

Educational institutions are expected to make policies to improve the quality of learning, especially in the development of learning strategies that are more student-oriented or better known as student centered learning. Lecturers are advised to use PBL learning strategies in managing nursing learning to improve student learning outcomes. PBL is a learning approach that is used to stimulate high-level thinking of students in situations that are oriented to real-world problems, including learning how to learn.

**Conflict of Interest:** No

**Ethical Clearance:** Yes

**Source of Funding:** Authors

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An Analysis of Psychological Health of Suicide Bombers’ Family in Surabaya

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Abstract

The increase of terrorism cases recently has become the world’s interest and Indonesian government’s as well. One of the cases occurred in Surabaya on May 13 and 14, 2018 that targeted three churches and one police station. There is a major change in terrorism act in which it now involves the bomber’s family members as the attacker. If in the previous cases women are considered as the influencers, in the present case they become the perpetrators who also involve their children to be a part of the attack. Thus, this present study aims to elaborate the psychological condition of the suicide bombers’ family.

Keywords: Health, Psychology, Family, Suicide bomber

Introduction

Terrorist refers to the person who uses violence by creating extreme fear in order to achieve his/her goals, for instance political goals(1). Terrorism is “planned, political-oriented violence performed by splinter groups or underground agents and aimed for unarmed targets in order to provoke public”(2).

Ancient Greek history Xenophon (430-349 SM) stated that psychological warfare had been used as an attempt to defeat enemy. In the early of French revolution (1793–1794), terrorism became a belief of coercion that is used to express opinion by doing something illegal that leads to violence, brutality and even murder(3).

Terrorism is chosen by certain group of people or organizations to force their will. Those people collectively choose terrorism as the primary action to achieve the goals without considering other alternatives(4).

A suicide bombing case occurred in several church in Surabaya on May 14, 2018. The bombers are Dita Aprianto and his whole family members that also have been killed during the bombing. They are Puji Kuswati, Dita’s wife; his daughters Fadilah Sari [12] and Pamela Riskika [9]; and his sons Yusuf Fadil [18] and Firman Halim [16].

There is a major change in terrorism act in which it now involves the bomber’s family members as the attacker. If in the previous cases women are considered as the triggers, in the present case they become the perpetrators who also involve their children to be a part of the attack.

Chief of the Indonesian National Police, Tito Karnavian explains that it is the first bombing case that involves children. This statement is also supported by Heru Susetyo, a critic from University of Indonesia. He explains that recently, there is a change in terrorism attack pattern. Formerly, terrorists are mostly young man with poor education background. Lately, terrorism attack also involves women and children in the action(5).

Post (1984)(6) in his study revealed that there is no psychopathological indication in the terrorists. Similar study is also conducted by Crenshaw(7) concerning the characteristics of terrorist organization called National Liberation Front (NLF) in Algeria. Crenshaw described that usually, terrorists are considered as common people

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or civilians with high intelligence.

Heskin (1984)\(^6\) who conducted study on terrorism case of the members of Irish Republican Army (IRA) in North Ireland. The result of the study indicates that terrorists are considered having emotional disorder. From the results of those studies, it can be inferred that generally, most terrorists or bomb attackers have psychopathological disorder. In regard to their social background, Clark, in his study of terrorism of Euzkadi Ta Askatasuna (ETA) in Spain, stated that most terrorists come from marginal families that experienced harassments in many aspects of life\(^8\).

Sociologically, multicultural issues often cause racial centrism that vulnerable to conflict as it closely related to ideology believed by those social groups. Thus, the result of several studies complied by Reich\(^9\) assert that ideology-related terrorism is not a sui generis concern–unidentified uniqueness–nor unexplained, random attack on humanity.

Reich\(^9\) from his experience in Weatherman organization explained that there are three phases of withdrawal process that underlying the formation of terrorism; (a) trust crisis phase, (b) legitimacy conflict and (c) legitimacy crisis. Each phase shows certain collective political stance identities that want to be achieved by certain groups are ideologically motivated.

Oppenheim\(^10\) undertook a study on radical ideology, terrorism and barbarian war of a group of adolescence and young adults. The result of the study showed that actually there is no certain sociological or psychopathological characteristic identified in those adolescences. However, there is a tendency of having triggers of weaknesses in regard with narcissism and identity.

The phenomenon of bombing case in Surabaya as what has been explained before shows that radicalism is getting worse since the perpetrator no longer execute his action individually but also involve the whole family member as the attacker\(^11\). This concern is crucial and is of significant to be analyzed. Therefore, this present article aims to discuss the psychological condition of the suicide bombers family in Surabaya.

Based on the previous explanation, this article will discuss how the psychological condition of the suicide bombers is and what kind of motivation the family had to do the suicide bomb.

**Research Methods**

This present study is a sociological research. It employs descriptive qualitative approach\(^12\).

**Results and Discussion**

Process that Triggers the Family to be the Suicide Bombers

To understand the process that may change common people into a terrorist, the researchers apply the theory of Staircases to terrorism from Moghaddam (2005)\(^13\). Staircases to terrorism refers to the processes someone may go through in becoming a terrorist. The aforementioned staircases include:

Ground floor that refers to search for meaning. In this stage, there is a disappointment and deprivation towards other groups’ condition that is perceived better than one’s own condition. Such condition is commonly known as identity crisis that may lead to a judgmental injustice perception of own group towards other groups.

First floor that refers to presenting the ideology. In this stage, there is a tendency to search for enemy or party to blame that is perceived being injustice or unfair to their groups. Thus, they start questioning how to defeat that injustice.

Second floor or known as cultivation stage. In this stage, the psychology and mental processes that triggers certain group to defeat injustice groups occur. The basis is displacement aggression; activities of torturing or cursing the other parties that are perceived causing injustice.

Third floor or the moral engagement. This stage involves moral doctrines to influence the perpetrators’ psychology. The purpose is to make them believe that what they do is not wrongdoing. Thus, they are mentally convinced and steady to spread the terror.

Ahmad Faiz Zainuddin [40], one of Dita’s colleagues, explains that he has close relationship to some people in Dita’s circle including the mentor or indoctrinator. Faiz further says that during his schooldays as senior high school student, Dita often conveyed his ideology in which he believed that the country should apply Islamic law. However, he never turned his ideology into an action, even violence\(^14\).
The founder of Indonesian de-radicalization organization Ali Fauzi assumes that Dita has believed the doctrine of radicalism and then pass it through his wife and children for a long time(15).

This statement is in line with the statement of Suratno, suicide bomber researcher. In this case, he states that indoctrination or brainwashing through psychological influence, family relationship and marriage is the easiest brainwashing activities to do.

Family relationship and marriage is considered effective to form networking since there is a strong psychological effect that bond one to each other. The affective aspect appears due to the close relationship as family while the cognitive aspect is involved since such close relationship is utilized in an extreme way(16).

The director of Institute for Policy Analyst of Conflict (IPAC) Sidney Jones (2018) states that such doctrines that convincing one’s thought psychologically is the same doctrine technique used by ISIS. Chief of the Indonesian National Police Tito Karnavian confirms that the bomb attacks in Surabaya that involve family members indicate a correlation between the attacker and ISIS. Even though the families never come to Syria before, those families have the same ideology and are still connected to other families that have been in Syria before yet currently stay in Indonesia(17).

In accordance with two previous statements, Inspector General of Indonesia National Police Machfud Arifin asserts that the bomb attacker Dita Aprianto engaged his family members in the doctrine processes through recitations or religious studies. In such studies, many videos showing how terrorists execute their bomb attack from which the prospective attackers and their family got brainwashed to be suicide bombers(18).

According to preceeding description, it can be seen that the whole family members of Dita Aprianto have been following the psychological doctrines as what has been explained by Fathali Maghadam in the Staircases theory(19). Actually Dita had been through the first and the second floor during his school life as senior high school student.

The third floor had been through once Dita graduated from senior high school. then he has been radicalized and radicalized his family. Dita believed in the doctrine and due to the strong bond he and his family had, he also engaged his family to be involved in the case as well as what is previously described by Suratno.

Halverson, Goodall & Corman(19) defined that there are three kinds of extreme narration within the radicalism process. They are:

Build understanding that extremist massager is a universal accepted understanding (obscuring internal contradiction).

Give an impression that what happened in certain places is a part of global or universal enemy’s scenario (universalizing them within populations).

Create an impression that their perspectives are common sense (naturalizing their claims as “common sense”)

Physical Condition of Perpetrators

Ahmad Faiz Zainuddin, one of Dita’s friends, revealed that Dita’s family came from a good family. He was not stressed. His educational achievement was great. He had an educational background as a chemistry graduate. He was also from a wealthy family, he was a loyal friend and gentle.

The defendant of the terrorism case Aman Abdurrahman, at a hearing at the South Jakarta District Court, Friday, May 25 2018, said that those who carried out or taught family involvement in the two incidents of bomb terror in Surabaya were mentally ill people and frustrated with life. According to him, two mothers who brought their children to be suicide bombers were emotionally and mentally ill(20).

The Bali Bombing 1 perpetrator, Umar Patek, when invited to be a guest speaker at the Mata Najwa program, gave his response to the Surabaya Bombing. According to Patek, this recent suicide bombing were irrational. This could not be accepted in Islamic point of view, because it involved children and women in their actions(21).

According to the Head of the East Java Regional Police Psychology Section, AKBP Said Rivai, someone who experienced this situation needed to keep the mission secret. The children-suicide-bombers were forced to do this because he got psychological and psychological stress(22).
Furthermore, Ali Fauzi, the former head of the East Java Jamaah Islamiah (JI) bomb assembly instructor and founder of the Peace Circle Foundation, said that the suicide bombing by one family was not purely due to an ideological process. According to Fauzi, the perpetrators were overdose brainwashing so that his thoughts experience anomalies.\(^{(20)}\)

Thus, Dita Aprianto and her family did not experience any abnormalities or suffered from mental illness as a reason for them to commit suicide bombings. However, they were psychologically ill after experiencing a long process of indoctrination. These thought and psychological anomalies occurred and caused them to sacrifice their children and families. This would not be experienced naturally without religious indoctrination.

### Motivation of the Perpetrators

Chief of National Police, Tito said the family head of the suicide bombers in the Wonocolo apartment, Sidoarjo, was a close friend of the one who was responsible for the suicide attack in three churches in Surabaya. Anton Febrianto \(^{(47)}\) was killed along with his wife, Puspita Sari \(^{(47)}\) and his first child, LAR \(^{(17)}\). While the other three children, LAR \(^{(15)}\), FP \(^{(11)}\), GHA \(^{(11)}\) suffered injuries and were treated in Bhayangkara Hospital. Normal mental conditions would not be able to make someone sacrifice their family for an absurdity. Anton was found dead while holding a bomb switch\(^{(23)}\).

According to the Director of the Institute for Policy Analyst of Conflict (IPAC) Sidney Jones, suicide terror bombings in Surabaya on May 13 and 14 2018 by utilizing cells radicalized through indoctrination. Suicide bombers in Surabaya and Sidoarjo have the same indoctrinator, impersonating the same teacher of recitation, Khalid Abu Bakar. While Khalid has a linked-network in Syria, named Gana\(^{(24)}\).

According to Erick Shaw\(^{(25)}\), there are four stages of a common developmental pathway of thought: first, the process of early socialization; second, narcissistic injuries, for example negative life events and negatively affect self-image or self-esteem; third, escalation events (often confrontations that cause perceived provocation). This developmental pathway of understanding was no longer normal. The psychiatric conditions of suicide bombers in Surabaya had changed dramatically over a long period of time, therefore, the perpetrator believed something immoral as a good principle.

Their post-indoctrination motivation was to maintain self-esteem or honor and revenge for escalation events. These people actually had a normal thought process but their psychological conditions were like robots who were ready to be ruled anytime and anywhere although it harmed many people.

### Conclusion

It can be concluded that before becoming a terrorist, Dita Aprianto and his family had experienced indoctrination since Dita was in high school. Dita underwent the third phase after graduating from high school, by evolving into a belief that killing other people whose perception and belief are different is an obligation.

Dita Aprianto and his family had no medical record of any abnormalities or mental illness before and when they committed suicide bombings. This mental and psychological disorder was not recorded because this pattern of indoctrination was veiled, but this could be seen from their suicide bombing actions.

The head of the East Java Regional Police Psychology Section, Said Rivai, argued that this psychological disorder was a form of expression of his mental pressure. This happened because they carried suicide bombings, leaving behind their lives and families. This suicide bombing was also in secret. Dita and her family committed suicide bombings because of indoctrination factors that influenced their psychological and mental thought.

### Ethical Clearance

**Yes**

### Source of Funding

Authors

### Conflict of Interest

**No**

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Bacterial Contamination of Cell Phones of Health Care Providers at a Tertiary Care Centre

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Abstract

Introduction: Health Care Associated Infections (HCAI) caused by Multidrug Resistant (MDR) bacteria are an emerging risk factor in many institutions; cell phones being a convenient mode of communication and an easy mode of carrying patient information are used extensively by Health Care Workers (HCWs). Their cell phones can be a potential reservoir for harmful pathogens that can cause nosocomial infections. Further more, the extensive use of cell phones can easily transmit these pathogenic bacteria towards both the ends of the health care hierarchy.

Objectives:

To isolate the aerobic bacterial pathogens present on cell-phones of the Health Care Workers at a Tertiary Care Centre.

To assess the antibiotic sensitivity pattern of these isolates.

Materials and Method: In this study a random sampling of cell phones of 30 HCWs was carried out from wards of the hospital. Swabs were collected and processed as per standard techniques. AST was carried out according to CLSI 2018 standard guidelines.

Results: Bacteriological analysis of 30 samples yielded a total of 42 isolates. Of these 42.8% isolates were pathogenic of which 14%(6) were Pseudomonas aeruginosa, 17%(3) Staphylococcus aureus, 7%(3) Enterobacter cloacae complex, 5%(2) Acinetobacter spp., 2%(1) Diphtheroids, 2%(1) Klebsiella spp., 2%(1) Aeromonas salmonicida, 2%(1) Acinetobacter baumannii complex. Remaining 57.2% isolates were non-pathogenic of which 12%(5) were Sphingomonas spaucimobilis, 10%(4) Staphylococcus hominis, 10%(4) Staphylococcus warneri, 7%(3) Kocuria varians, 2%(1) Kocuria rosea, 2%(1) Pseudomonas stutzeri. The antibiotic sensitivity pattern of the pathogenic isolates revealed a few alarming results.

Conclusion: The results of our study reveal that cell phones are contaminated with bacteria and can act as a reservoir for harmful pathogenic bacteria that can cause HCAI.

Key Words: - Cell Phones, Contamination, Hospital Acquired Infections, Drug Resistance.
termed as Health Care Associated Infections (HCAI). Such healthcare-associated infections or nosocomial infections add to the morbidity, mortality and costs that one might expect from the underlying illness alone.¹,²

The routes of transmission of microorganisms or cross-contamination that cause infections include ariel, oral, contact and parenteral route.

The main focus here being the contact route, because the rates of adherence to hand-hygiene recommendations are abysmally low. Reasons cited include inconvenience, time pressures, and skin damage from frequent washing. Use of alcohol rubs is highly effective except when the hands are visibly soiled.³

Today, India has about 287 million mobile phone users, in health care setting, they are essential for quick and easy access to laboratory and imaging reports, for consultations, and sometimes for life threatening emergencies.⁴

Studies have shown that both Gram-negative as well as Gram-positive bacteria can survive for months on dry surfaces, with longer survival rate when in humid and lower-temperature conditions, which are provided by the sweat from a person’s body and the warm body of cell phones.⁵ In today’s health care system, the use of cell phones has reduced the morbidity rate drastically, by helping in fast communication within hospital settings and spreading medical knowledge at an unbelievable speed, causing a visible decrease in morbidity rate. However, one of the most concerning factor regarding heavy use of cell phones is that they can act as reservoirs of pathogenic bacteria and other microorganisms. People rarely clean their mobile phones, as they are uninteresting to clean. Hence, the cell phones have the potential of being contaminated with a variety of bacteria. Many studies have been conducted on cell phone contamination among healthcare workers that is clinicians, nurses, ward assistants and in community. But, very few projects have been conducted in this part of the world based on bacterial contamination of cell phones used by health care workers.⁶ ⁷

Thus, minimum required number of health care workers with cell phones is:

\[ 29 \]

So, a minimum of 29 health care workers with cell phones will be required.

Samples were collected randomly from cell phones of 30 resident doctors and nursing staff posted at different wards at the Tertiary Care Centre.

**Materials and Method**

After the clearance from institutional ethical committee the study was conducted at the tertiary care center. Then an informed consent was taken from the health care provider participating in the study. The confidentiality was maintained about the identity of participants, by giving them an identification code. A questionnaire of 4 questions related to knowledge, and 3 questions related to their practices were requested to be answered which included “Yes” or “No” questions and one-line answers. While samples were collected from the participant’s cell phone, which they use dominantly at their work place, covering the surface area of their cell phone (screen, sides and the back and if present, the backside of the cover) using a sterile swab dipped in sterile peptone water, using standard aseptic precautions. The swabs were then transferred to microbiology laboratory for inoculation on blood, chocolate and MacConkey’s agar, which were incubated overnight, the culture were then processed for identification and speciation of aerobic bacterial growth using standard methodology, identification and antibiotic sensitivity of these growths were processed using Vitek 2 Compact as per CLSI Guidelines.¹⁰ The data collected from the questionnaire and laboratory results were be analyzed using Microsoft Excel software. Descriptive statistics were used to calculate percentage of each response given.

**Study Design: Cross-Sectional Study**

**Study Setting:** Krishna Hospital and Medical Research Centre. (KH & MRC)

**Study Population:** Health Care Providers working at the Institutional Hospital

**Inclusion Criteria:** Health Care Providers who are willing to give an informed consent and carry and use a cell phone.
Findings

Bacteriological analysis of 30 samples revealed that a total 42 organisms were isolated, of these 42.8% isolates (n=18) were pathogenic of which 14% (6) were Pseudomonas aeruginosa, 17% (3) Staphylococcus aureus, 7% (3) Enterobacter cloacae complex, 5% (2) Acinetobacter spp., 2% (1) Diphtheroids, 2% (1) Klebsiella spp., 2% (1) Aeromonas salmonicida, 2% (1) Acinetobacter baumannii complex. (Fig. 1) Remaining 57.2% (n=24) isolates were non-pathogenic of which 12% (5) were Sphingomonas paucimobilis, 10% (4) Staphylococcus hominis, 10% (4) Staphylococcus epidermidis, 7% (3) Staphylococcus arlettae, 5% (2) Staphylococcus haemolyticus, 5% (2) Staphylococcus warneri, 5% (2) Kocuria varians, 2% (1) Kocuria rosea, 2% (1) Pseudomonas stutzeri. (Fig. 2) A total of 42.8% (n=18) organisms were pathogenic, can be potentially harmful in a hospital setup (Fig. 1). Their antibiotic sensitivity pattern (Table. 1) revealed that the pathogenic bacteria showed significant isolates were having resistance towards penicillin group, beta-lactam and beta-lactamase inhibitor combination, lincosamide, and macrolide groups. But, the major alarming point was that 30.8% of the pathogenic isolates were even resistant to colistin.

The questionnaire that was used for the study reported that 53% (n=16) participants wash their hands in between using their cell phone and patient contact and 47% (n=14) did not wash their hands in between interpatient contact. (Fig. 3) It was also reported that 70% (n=21) participants clean their phone regularly or had cleaned it recently and 30% participants (n=9) had never cleaned their phone till date. (Fig. 6) The questions based on participant’s knowledge revealed that 97% (n=29) of them think that their phone is contaminated, where as 3% (n=1) participants were of the view that their phone is not contaminated with bacteria (Fig. 4) and of these 83% (n=25) of them think that their phone can transmit any disease where as 17% (n=5) (Fig. 5) think that their phone cannot transmit bacteria or organisms. The participants have used hand sanitizer frequently as a cleaning agent, followed by use of spirit, and few participants only used cotton ball.

### Table 1. Antimicrobial Sensitivity Pattern – Pathogenic Organisms

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Resistant isolates (n/n)</th>
<th>Sensitive isolates (n/n)</th>
<th>Resistant (%)</th>
<th>Sensitive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzylpenicillin</td>
<td>2/3</td>
<td>1/3</td>
<td>66.7 %</td>
<td>33.3 %</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>1/3</td>
<td>2/3</td>
<td>33.3 %</td>
<td>66.7 %</td>
</tr>
<tr>
<td>Ticarcillin/Clavulanic Acid</td>
<td>0/8</td>
<td>8/8</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Amoxi/Clavulanic Acid</td>
<td>3/3</td>
<td>0/3</td>
<td>100.0 %</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Piperacillin/Tazobactam</td>
<td>1/13</td>
<td>12/13</td>
<td>7.7 %</td>
<td>92.3 %</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>0/8</td>
<td>8/8</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>3/4</td>
<td>1/4</td>
<td>75.0 %</td>
<td>25.0 %</td>
</tr>
<tr>
<td>Cefuroxime Axetil</td>
<td>2/3</td>
<td>1/3</td>
<td>66.7 %</td>
<td>33.3 %</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>1/4</td>
<td>3/4</td>
<td>25.0 %</td>
<td>75.0 %</td>
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<td>13/13</td>
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<td>0/12</td>
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<tr>
<td>Doripenem</td>
<td>1/7</td>
<td>6/7</td>
<td>14.3 %</td>
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</tr>
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<td>Ertapenem</td>
<td>0/3</td>
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<td>100.0 %</td>
</tr>
<tr>
<td>Imipenem</td>
<td>1/12</td>
<td>11/12</td>
<td>8.3 %</td>
<td>91.7 %</td>
</tr>
</tbody>
</table>
**Table 1. Antimicrobial Sensitivity Pattern – Pathogenic Organisms**

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>Sensitive</th>
<th>Resistant</th>
<th>% Sensitivity</th>
<th>% Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meropenem</td>
<td>1/12</td>
<td>11/12</td>
<td>8.3 %</td>
<td>91.7 %</td>
</tr>
<tr>
<td>Amikacin</td>
<td>0/12</td>
<td>12/12</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>0/3</td>
<td>3/3</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>0/2</td>
<td>2/2</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>1/3</td>
<td>2/3</td>
<td>33.3 %</td>
<td>66.7 %</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>0/2</td>
<td>2/2</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Linezolid</td>
<td>0/3</td>
<td>3/3</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>2/3</td>
<td>1/3</td>
<td>66.7 %</td>
<td>33.3 %</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>2/3</td>
<td>1/3</td>
<td>66.7 %</td>
<td>33.3 %</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>0/3</td>
<td>3/3</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>0/16</td>
<td>16/16</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Nalidixic Acid</td>
<td>0/4</td>
<td>4/4</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>4/15</td>
<td>11/15</td>
<td>26.7 %</td>
<td>73.3 %</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>4/11</td>
<td>7/11</td>
<td>36.4 %</td>
<td>63.6 %</td>
</tr>
<tr>
<td>Minocycline</td>
<td>0/1</td>
<td>1/1</td>
<td>0.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>5/16</td>
<td>11/16</td>
<td>31.3 %</td>
<td>68.8 %</td>
</tr>
<tr>
<td>Nitrofurantion</td>
<td>2/7</td>
<td>5/7</td>
<td>28.6 %</td>
<td>71.4 %</td>
</tr>
<tr>
<td>Colistin</td>
<td>4/13</td>
<td>9/13</td>
<td>30.8 %</td>
<td>69.2 %</td>
</tr>
<tr>
<td>Trimeth/Sulfameth</td>
<td>1/9</td>
<td>8/9</td>
<td>11.1 %</td>
<td>88.9 %</td>
</tr>
</tbody>
</table>

**Pathogenic Organisms Isolated**

- *Klebsiella spp*
- *Diphtheroid*
- *Staphylococcus aureus*
- *Acinetobacter baumannii complex*
- *Enterobacter cloacae complex*
- *Aeromonas salmoniidae*
- *Acinetobacter spp*
- *Pseudomonas aeruginosa*

**Non-Pathogenic Organisms Isolated**

- *Kocuria rosea*
- *Kocuria varians*
- *Staphylococcus arletiae*
- *Staphylococcus warneri*
- *Staphylococcus epidermidis*
- *Staphylococcus hominis*
- *Staphylococcus haemolyticus*
- *Pseudomonas stutzeri*
- *Sphingomonas paucimobilis*
Discussion

The main aim of the present study was to assess the bacterial profile of contaminated cell phones of health care workers associated with a Tertiary Care Center and the results of our study show that the a number of cell phones harbor pathogenic bacteria and are hence a potential threat in spreading Health Care Associated Infection (HCAI). This study showed 100% rate of contamination of cell phones as compared to other studies which showed S. Zakai et al.11 (96.2%), Heyba et al.12 (74%), J. Lavanya13 (56%), Bhumbla et al.14 (92%), Sedighi I et al.6 (99.2%), Shakir et al.8 (83%) contamination of total samples tested. In this study it was reported that 70% samples showed monomicrobial growth, whereas 30% samples showed polymicrobial growth.

Education of health care workers regarding infection control can be a part of staff health care programs, which can increase awareness about transmission of potentially pathogenic bacteria. Continuous visual stimulus can help decrease spread of HCAI’s in the form of hand hygiene posters and leaflets. About 17% participants (Fig. 5) were unaware of the fact that their cell phone can transmit bacteria which in certain scenarios can be potentially harmful, and even if the participants are aware of potential transmission of bacteria about 70% of them have never cleaned their cell phone. Further studies can be carried out to pull up the most effective and convenient method of disinfection without causing any harm to the Health Care Worker’s skin and their cell phones.

Conclusion

To conclude, our study reveals that the cell phones of Health Care Workers can get contaminated with pathogenic bacteria and some bacteria showed alarming antibiotic sensitivity patterns with resistance to penicillin, cephalosporins and even carbapenem and polymyxin groups, and could serve as a reservoir for hospital acquired infections. Significant percentage of health care workers does not wash their hands in-between interpatient contact after cell phone use. Regular hand washing might be a single most effective preventive method to avoid transmission of these potentially pathogenic bacteria.

Source of Funding: We are thankful to Krishna Institute of Medical Sciences “Deemed To Be University”, Karad for funding the project.

Conflict of Interest: - ‘The authors declare that there is no conflict of interest.’

Ethical Clearance: - Taken

References


15. Selim HS, Abaza AF, Microbial contamination of mobile phones in a health care setting in Alezandria, Egypt. GMS Hyg Infect Control. 2015; 10:Doc03

Transition Mutations of Interleukin-4 gene 590C>T in Patients with Type-2 Diabetes Mellitus

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Department of Biology-College of Education for Pure Science-University of Wasit –Iraq

Abstract

Background: The regulation of immune system at multiple levels is related with IL-4. Diabetes is a global health problem and plays an important role in the high mortality rates in the world.

Aim: In current work the mutational changes related with of IL-4-590 C>T gene polymorphisms were analyzed among 64 type -2 diabetic patients (T2DM) and 26 individuals as control group. Patients and controls were from Wasit province in Iraq.

Study design: The study design was case –control study.

Materials and Method: The allele-specific PCR (ARMS-PCR) technique was used to detect the IL-4-590 C>T gene polymorphism (rs2243250). PCR products for IL-4-590 C>T and primers were prepared for sequencing analysis in order to detect mutations and alterations in IL-4 -590 C>T gene of T2DM patients.

Results: After alignment of product amplification of IL-4 590C>T CC or CT genotypes, there are nine transition substitution mutations in patients with diabetes mellitus. Transition substitution mutations: Transition substitution mutations: six transition substitution mutation adenine to guanine in site 721, Guanine to adenine in site 858, and, guanine to adenine in site 858.

Conclusions: We conclude that different transition mutations at IL-4 gene 590C>T are associated with type-2 diabetes mellitus.

Keywords: Interluekin-4, diabetes mellitus, polymerase chain reaction, transition, mutation.

Introduction

The regulation of immune system at multiple levels is related with IL-4. IL-4 is considered as survival and growth factor of lymphocytes. It has important role in the differentiation of B cells in addition to regulation of T cells differentiation in immune response. The resting T cells after antigen exposure are differentiated to Th1 and Th2. These processes depend on cytokines. Furthermore, protection of lymphoid cells from programmed cell death is also by IL-4. Diabetes is a global health problem and plays an important role in the high mortality rates in the world. The complexity of this disease is linked to several factors including genetic heterogeneity, interactions between genes and the environment. The pathophysiology of T2DM is associated with inflammation and immunological phenomena (e.g. antibodies of anti-islel cell, high levels of cytokines and conventional related with type 1 diabetes are emerging in many patients with type 2 diabetes, chemokines) and obesity, that has a strong relationship with resistance to insulin and T2DM. interleukin-1 gene family of cytokine proteins has a pathological role in diabetes. Diabetes is associated with alleles of genes that encode to immune or inflammatory mediators. Eighteen Previous studies showed that secretion of IL-4 can be affected by its polymorphisms in -590 region. Rare studies investigated the association of IL-4-590C>T with T2DM in Iraqi patients. The current study is aimed to analyze the mutational changes related with IL-4-590 C>T gene polymorphisms among Iraqi cases from Wasit province.
Materials and Method

Two groups of subjects were included in this study: 64 type-2 diabetic patients (T2DM) and 26 individuals as control group. Patients and controls were from Wasit province in Iraq. Blood samples (5ml) were collected from patients and controls, then transferred into EDTA tubes for DNA extraction. Genomic DNA was isolated from blood samples using Quick-gDNA™.

Agarose gel electrophoresis of DNA

Agarose gel electrophoresis of DNA using agarose gel was used to detect. The DNA fragments after extraction and to investigate the interaction results of PCR by the presence of the standard DNA to differentiate the bundle size resulting from the reaction of PCR on the agarose gel.

Genotyping of IL-4-590 C>T

Detection of IL-4-590 C>T gene polymorphism (rs2243250) was done using allele-specific PCR (ARMS-PCR) technique. Two primers were used in two reactions for every subject.

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence</th>
<th>Tm (°C)</th>
<th>GC (%)</th>
<th>Product size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse(R)</td>
<td>5’- GAA TTT GTT AGT AAT GCA GTC CTC C- 3’</td>
<td>54</td>
<td>40</td>
<td>F1+R=216bp</td>
</tr>
<tr>
<td>Forward 1(F1)</td>
<td>5’-ACA CT A AAC TTG GGA GAA CAT TGT T - 3’</td>
<td>54.9</td>
<td>36</td>
<td>F2+R=248 bp</td>
</tr>
<tr>
<td>Forward 2(F2)</td>
<td>5’-ACA CT A AAC TTG GGA GAA CAT TGT C - 3’</td>
<td>55.3</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Specific primers of IL-4

Five μL of each primer in reactions, 10 μL of Dream Taq Green PCR Master Mix (2X) (Fermentas, K 1081, USA) to a final volume of 25 μL. Thermal cycler was used to carried out the amplification reactions with 1 min at 96 followed by 10 cycles, of 95° for 15 s, 65° for 50 s, 72° for 40 s, and 72° for 40 s; 20 cycles then 20 cycles of 95° for 50 s, 59° for 50 s, and 72° for 50 s. Products of PCR were electrophoresed, visualized and photographed.

PCR products sequencing

PCR products for IL-4-590 C>T and primers were sent to Macrogen company /South Korea for sequencing analyses in order to detect mutations and alterations in IL-4 -590 C>T gene of patients with T2DM.

Sequencing of IL-4 590C>T gene

Samples of amplified PCR-products of IL-4 590C>T CC or CT genotypes from patients with T2DM by direct sequencing to detect SNPs within these sequences. Our sequences were compared with reference sequence of IL-4 590C>T CC or CT genotypes in national center biotechnology information (NCBI) Gene Bank. The sequencing appeared 100% compatibility with Homo sapiens IL-4 590 C>T gene CC or CT genotypes. Homo sapiens haplotype HHF*4 interleukin-4 (IL-4) gene, promoter region and partial cds. Sequence ID: GQ892017.1 Length: 1340 Number of Matches: 1

The results of IL-4 590C>T of CC genotyping are shown in Figure 1.

CT genotyping results of IL-4590C>T are shown in Figure2.
Table 2: The genotype sequenced of IL-4 590C>T gene against the sample number

<table>
<thead>
<tr>
<th>Genotype</th>
<th>No. of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td></td>
</tr>
</tbody>
</table>

Scanning of IL-4 590C>T CC or CT genotypes

After alignment of product amplification of IL-4 590C>T CC or CT genotypes, nine transition substitution mutations in patients with diabetes mellitus Table 2. Transition substitution mutations: six transition substitution mutation adenine to guanine in site 721, Guanine to adenine in site 858, and guanine to adenine in site 858.

Table 3: Transition Mutations in IL-4 590C>T CC or CT genotypes in type-2 DM patients obtained from sequencing analysis.

<table>
<thead>
<tr>
<th>No. Of sample</th>
<th>Type of substitution</th>
<th>Location</th>
<th>Nucleotide</th>
<th>Sequence ID</th>
<th>Score</th>
<th>Expect</th>
<th>Identities</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Transition</td>
<td>721</td>
<td>A&gt;G</td>
<td>ID: GQ892017.1</td>
<td>272</td>
<td>1e-70</td>
<td>99%</td>
<td>Homo sapiens (IL-4) gene, promoter</td>
</tr>
<tr>
<td>8</td>
<td>Transition</td>
<td>858</td>
<td>G&gt;A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transition</td>
<td>721</td>
<td>A&gt;G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Transition</td>
<td>858</td>
<td>G&gt;A</td>
<td>ID: GQ892017.1</td>
<td>292</td>
<td>2e-76</td>
<td>98%</td>
<td>Homo sapiens (IL-4) gene, promoter</td>
</tr>
<tr>
<td></td>
<td>Transition</td>
<td>721</td>
<td>A&gt;G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sequencing of IL-4 590C>T gene of patients with type 2 DM with CC or CT genotypes compared with genotypes of IL-4 590 C>T obtained from gene bank as follows:

**Discussion**

Type-2 DM is multifactorial disease and is related with several mutational changes. There are numbers of polymorphic loci that exist in the IL-4 gene promoter. These sites have been reported as the vulnerability of several diseases including the IL-4-33C/T, IL-4-589C/T, and IL-4-590C/T specifically frequencies of the genotype and allele of IL-4-590C/T were well investigated and noted to be related with different diseases. The IL-4 one of the hematopoietic cytokines, play an important role in regulation and stimulation of T-lymphocytes. In allergic conditions and infections, the naturally mechanism of protection is due to IgE. Moreover, it perform an important role in T2DM pathophysiology. In this study, after alignment of product amplification of IL-4 590C>T CC or CT genotypes, there are nine transition substitution mutations in patients with diabetes mellitus. Transition substitution mutations: six transition substitution mutation adenine to guanine in site 721, Guanine to adenine in site 858, and Guanine to adenine in site 858. To our knowledge this is the first study of sequencing analysis in the -590 region of IL-4 gene in patients with type 2 DM. The transition mutations which are associated with hyperglycaemia can be considered as a new biomarker for genetic material damage and possibly due to oxidative stress. The regulation process of the next exon may be associated with the substitution mutation in the intron region. DNA mutations that reserve the rings same number in the nucleotide base are transition mutations. In contrast, transversion mutations include changing the nucleotide base from a pyrimidine to a purine or vice versa. In the protein-coding regions of human genome, transition mutations are fortified over transversion mutations. Transversion mutations result in amino acid substitution and that is the reason that these mutations thought to be depleted in exons. The rate difference between these two types of mutations is an essential evolutionary studies at molecular basis. Transversion mutations result in disruption of transcriptional factors binding, lead to great alterations in gene expression. We conclude that different mutations at IL-4 gene 590C>T are associated with T2DM.

**Conflict of Interests:** The author declares complete freedom of any issue concerning conflict of interests related to this work.

**Source of Funding:** Self-supporting

**Ethical Clearance:** The author declares that this research was carried out with the approval of the scientific committee of science department of biology at the Faculty of Education for Pure Sciences, University of Wasit - Iraq.

**References**


2. Nelms K, Keegan AD, Zamorano J, Ryan JJ, Paul WE. The IL-4


Relaxation Intervention and Counselling Models in Controlling Stress in Cancer Patients

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Abstract

Cancer causes virus infections such as Hepatitis B/hepatitis C and human papilloma virus which has contributed 20% of cancer mortalities in the low-middle income countries. More than 60% of new cases and around 70% of cancer deaths in the world occur annually in Africa, Asia and Central and South America. It is estimated that annual cancer cases will increase from 14 million in 2012 to 22 million in the next two decades. The intervention program against cancer risk factors not only aims to reduce new cases of cancer, but also reduce the possibility of other diseases caused by risk factors. Almost all studies found that psychosocial interventions had a significant effect on the recovery of cancer patients. Psychological interventions accompanied by motivation for healing provide suggestions to cancer patients to have more spirits of life. Hence, various studies made recommendations for handling cancer by involving psychological interventions, giving motivation, and spiritual support to cancer patients. This study allowed researchers to combine the two methods to see the effectiveness or influence in reducing and controlling stress in cancer patients through counseling and deep breathing relaxation. This study aimed to identify models of counseling interventions and relaxation to control stress in cancer patients. In this study, it is concluded that most of the concepts and results of previous studies recommend an intervention model in the form of counseling and relaxation to control stress in cancer patients.

Key Words: relaxation and counselling, stress control, cancer

Introduction

Cancer is one of the leading causes of death in the world. Approximately 8.2 million deaths are caused by cancer. Lung, liver, stomach, colorectal and breast cancers are also the biggest causes of cancer mortalities every year. More than 30% of cancer deaths are caused by five behavioral and dietary risk factors, those are: high body mass index, low consumption of fruit and vegetable, lack of physical activity, cigarette smoking, and excessive alcohol consumption. Smoking is one of the main risk factors for cancer which causes more than 20% of cancer deaths in the world and around 70% of deaths from lung cancer worldwide⁴

Cancer that causes infections of viruses such as hepatitis B / hepatitis C virus and human papilloma virus contributes to 20% of cancer deaths in the low-middle income countries. More than 60% of new cases and around 70% of cancer deaths in the world occur annually in Africa, Asia and Central and South America. It is estimated that annual cancer cases will increase from 14 million in 2012 to 22 million in the next two decades.⁵

In the United States and several other developed countries, cancer is now responsible for around 25% of all deaths. Within a year, about 0.5% of the population is diagnosed with cancer. In adult men in the United States, the most common cancers are prostate cancer (33% of all cancer cases), lung cancer (13%), colon and rectal cancer (10%), bladder cancer (7%), and cutaneous melanoma (5%). The most common cause of death is lung cancer (31%), followed by prostate cancer (10%), colon and rectal cancer (10%), pancreatic cancer (5%)

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and leukemia (4%). Meanwhile, for adult women in the United States, breast cancer is the most common cancer (32% of all cancer cases), followed by lung cancer (12%), colon and rectal cancer (11%), endometrial cancer (6%, uterus) and non-Hodgkin’s lymphoma (4%). Based on cases of death, lung cancer is most common (27% of cancer deaths), followed by breast cancer (15%), colon and rectal cancer (10%), ovarian cancer (6%), and pancreatic cancer (6%). Statistics can vary greatly in other countries.

A diagnosis of cancer can cause feelings of fear, anxiety, depression, despair, and doubts in carrying out future plans. Cancer can significantly increase a patient’s spiritual needs. Because of self-esteem and spiritual beliefs are threatened and personal relationships are disrupted due to lack of self-confidence, previously adaptive mechanisms become insufficient. Meanwhile, hospital care can trigger feelings of loneliness and eventually, a spiritual crisis arises in them. This crisis can cause imbalances in the mind, body, and soul. In dealing with critical illness, such as cancer, patients bring out special needs, the most important of which is spiritual needs. These patients depend on spiritual aspects, and spiritual adjustment is the strongest method they use to deal with the disease.

Most studies found that psychosocial interventions had a significant effect on the recovery of cancer patients. Psychological interventions accompanied by motivation for healing provide suggestions to cancer patients to have more spirits of life. Therefore, various studies made recommendations for handling cancer by involving psychological interventions, giving motivation, and spiritual support to cancer patients.

Research on the implications of mental health in bladder cancer patients included 11 prospective studies and 8 retrospective studies. This study reviewed mental health problems, such as depression and anxiety, which often accompanied the diagnosis of bladder cancer with a worse prognosis associated with a greater psychological burden. Bladder cancer patients also have an increased suicide risk especially in older male patients who are not married with advanced disease status. Poor mental health can affect treatment outcomes such as postoperative complications and survival-related outcomes similar to physical health. While awareness of the importance of mental health in bladder cancer patients is growing, further studies are needed to assess the role of interventions such as cognitive behavior therapy or pharmacotherapy to optimize treatment.

The high incidence of cancer cases and around 40% of cancer deaths are likely related to risk factors of cancer that should be prevented. The risk factors of cancers are among behavior and eating patterns, including high body mass index; Less consumption of fruits and vegetables; Lack of physical activity; Cigarette smoking; Excessive alcohol consumption; other cancer risk factors, are due to exposure: physical carcinogens, such as ultraviolet (UV) and radiation; Chemical carcinogens, such as benzo (a) pyrene, formalin and aflatoxin (food contaminants), and fibers, for example asbestos; Biological carcinogens, such as virus, bacterial and parasitic infections.

The intervention program against cancer risk factors not only aims to reduce new cases of cancer, but also reduce the possibility of other diseases caused by these risk factors. Smoking, one of which, causes around 1.5 million deaths from cancer each year (60% of deaths occur in low-middle income countries). Overweight, obesity and lack of physical activity cause 274,000 cancer deaths every year; Excessive alcohol consumption causes around 351,000 cancer deaths each year; Sexual transmission of human papilloma virus (HPV) causes around 235,000 cancer deaths each year; Air pollution (outside and indoors) causes around 71,000 cancer deaths every year; Carcinogens in the work environment cause at least 152,000 cancer deaths each year.

Previous research examined the effect of training in relaxation techniques to reduce anxiety in primary caregiver breast cancer patients at home. The results of quantitative analysis using Wilcoxon nonparametric statistics and visual inspection graphs showed a significant difference score between before and during training with Z = -2.023 and p = 0.0215 (p <0.05).

Regarding to the learning model by Bandura (social cognitive theory), previously there was a model of this research that was counseling on the efficacy of adopting a behavioristic bandura learning model as conducted by researchers (Lev & Owen, 2000) with the research title Counseling women with breast cancer using principles developed by Albert Bandura. This study found that counseling interventions to promote self-efficacy can improve quality of life and reduce pressure for women diagnosed with breast cancer.
In this study design the researcher combined the two methods to examine the effectiveness or influence in reducing and controlling stress in cancer patients through counseling and deep breathing relaxation.

Based on the given facts, this study aimed to examine intervention counselling and relaxation models to control stress in cancer patients.

**Research Methodology**

This paper used a two-stage methodology for the formation of the initial model and conceptualization. This study collected several concepts, theories and some research results that were relevant to counseling and relaxation of stress control in cancer patients.

**Results & Discussion**

The results of this study found that cancer is caused by hormonal irregularities resulting in the growth of neoplasms in normal body tissues or often known as malignant tumors. In addition these symptoms are also known as malignant neoplasms and are often characterized by typical cell cycle abnormalities that allow cells to: grow uncontrollably (cell division exceeds normal limits), attack nearby biological tissues, and migrate to other body tissues through blood circulation or lymphatic system, called metastasis.

This disease is often known by the public as a tumor, but not all of them are cancer. Tumors are all abnormal lumps, and are divided into 2 groups, namely benign tumors and malignant tumors. Cancer is a general term for all types of malignant tumors. This disease can affect everyone, in every part of the body, and in all age group, but more often affects people who are 40 years old.

Cancer causes many different symptoms, depending on the location and character of the malignancy, and the presence or absence of metastasis. Diagnosis usually requires microscopic examination of tissue obtained by biopsy. After being diagnosed, cancer is usually treated with surgery, chemotherapy, or radiation. Most cancers cause death.

Commonly, cancer is referred to based on the type of organ or cell where it occurs. For example, a cancer that begins in the large intestine is referred to as colon cancer, whereas cancer that occurs in basal cells of the skin is referred to as basal cell carcinoma. Cancer classification is then carried out in more general categories.

Most cancers are recognized through visible signs or symptoms or through screening. Both of these methods do not lead to a clear diagnosis, which usually requires a biopsy. Some cancers are discovered accidentally during medical evaluation of unrelated problems. Because cancer can also be caused by methylation of certain gene promoters, early detection can be done by testing genes that become biomarkers for cancer. Some types of cancer have known the status of the biomarker methylation. For example for breast cancer BRCA biomarkers can be used, whereas for colorectal cancer can use Sox17 biomarkers.

Individual counseling is a counseling service organized by a counselor to clients in solving problems experienced by cancer patients. A counselling can be made through communication or face-to-face discussion between counsellor and client to discuss about past and present problems as well as unsolved problem in cancer patients. Discussion of problems in counseling is comprehensive and in-depth and touches on important things about the client (very likely to touch the client’s personal secrets). But it is also specific in the direction of problem solving.

Relaxation techniques are independent nursing interventions to reduce pain intensity, improve pulmonary ventilation and improve blood oxygenation. Skeletal muscle relaxation is believed to reduce pain by relaxing the muscle tension that supports pain, plenty of evidences show that relaxation is effective in relieving pain. The purpose of respiratory relaxation is to improve ventilation of the alveoli, maintain gas exchange, prevent lung attenuation, relax muscle tension, increase cough efficiency, reduce stress both physical and emotional stress which is to reduce pain intensity (control or reduce pain) and reduce anxiety.

Patients who carry out relaxation techniques achieve a greater focus of attention using Jacobson techniques and increased emotional control using visualization of surveillance and lifestyle are associated with stronger intentions, higher perceived needs, and lower concerns than kemoprevisi. Strong predictors of intention are women’s beliefs about risk reduction methods, especially for lifestyle and chemoprevention.

Cancer deaths are highly related to cancer risk factors that should be prevented. Cancer risk factors that consist of risk factors for behavior and eating patterns,
including high body mass index; Less consumption of fruits and vegetables; Lack of physical activity; Cigarettes smoking; Excessive alcohol consumption; other cancer risk factors. (7)

Conclusions

This study concluded that most of the previous concepts and studies recommend intervention model in a form of counselling and relaxation to control stress in cancer patients.

Ethical Clearance: Our study was not directly applied on human, hence ethical clearance was not required.

Source of Funding: Self funding.

Conflict of Interest: The author declare that he has no conflict of interest.

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Short-Term Survival of Ischemic Stroke Patients

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Abstract

Background: Identification of factors associated with short-term survival of ischemic stroke patients (survival <30 days).

Research Objectives: to analyze the relationship of blood pressure, pulse, respiratory frequency, GCS, instantaneous blood sugar, LDL cholesterol and triglycerides, history of hypertension, history of diabetes mellitus and a history of heart disease.

Method: This study used an observational analytic method with a retrospective design. Sampling uses purposive sampling. 258 samples were taken from medical record data from January 2016 - December 2017.

Results: Blood pressure, level of consciousness, momentary base sugar levels, triglycerides and history of DM that were significantly associated with the dependent variable (survival) in ischemic stroke patients. This can be seen from the ρ-value variable systolic blood pressure (ρ = 0.001) and diastolic blood pressure variable (ρ = 0.000), Awareness Level (GCS) (ρ = 0.000), instantaneous blood sugar (ρ = 0.015), triglycerides (ρ = 0.033), and history of DM (ρ = 0.005).

Conclusion: Ischemic stroke factors that are significantly related to short-term survival are blood pressure level of consciousness, instantaneous basic sugar levels, triglycerides and history of DM

Keywords: ischemic stroke factor, short-term survival

Introduction

Stroke is one of the causes of long-term mortality and disability throughout the world, and a number of 5.7 million people die each year. Stroke is the second leading cause of death worldwide. According to the WHO in 2015, strokes are a sudden neurological symptom caused by brain disorders and circulatory disorders that last more than 24 hours. Stroke mortality and disability continues to increase, also increasing the burden of stroke globally. Based on 1990-2013 Global Burden of Ischemic and Hemorragic Stroke data, around 13 million new stroke sufferers each year, and 4.4 million of them die within 12 months. The average percentage of stroke cases is 22.9% per month.

The biggest increase in stroke incidence occurred in Southeast Asia. Based on the results of the South East Asian Medical Information Center (SEAMIC) data, the largest stroke death rate in Southeast Asia is described in Indonesia. Stroke cases in Indonesia are estimated at 500 thousand people experience a stroke each year, 2.5% of them die while the rest experience mild disability to severe disability. This is also supported by the results of the 2012 Balitbangkes (Health Research and Development Agency) Ministry of Health of the Republic of Indonesia that nationally, the largest distribution of deaths in Indonesia is stroke with a percentage of 15.4%. In Indonesia, stroke is the number one cause of death in hospitals. The prevalence of stroke in East Java is ranked fourth, which is 16% based on the diagnosis of health workers. In Kediri Regency the number of stroke patients reached 1,431 people with male sufferers as many as 669 people and women with 762 lives.

Determination of minimum hospital service standards in 2008, one of which was to assess hospital mortality, namely the mortality rate of less than 48 hours and more than 48 hours. The Net Death Rate (NDR)
is death that is more than 48 hours after the patient is admitted to the hospital [7]. Calculation of Net Death Rate (NDR) is a mortality rate of 48 hours after the patient is treated for each 1000 patients out with a standard NDR value tolerated by the Indonesian Ministry of Health which is <25 per 1000 [8]. Based on the results of a preliminary study in the hospital. Kediri Baptists get the results of the number of ischemic stroke patients who entered the ED in 2015 amounting to 293 patients per year, in 2016 it increased by a number of 375 patients per year while in 2017 the number of stroke patients in the ED was 355 patients per year. The NDR of ischemic stroke patients in 2015 was 31.06 ‰, while the NDR of ischemic stroke patients in 2016 had decreased by 26.4 ‰ and NDR in stroke patients in 2017 increased by 26.6 ‰. Based on these data indicate ischemic stroke mortality in hospitals. Kediri Baptists are a concern because they exceed the NDR standard limits according to the provisions of the health ministry.

The American Heart Association in the initial management guidelines for patients with ischemic stroke is one of them by doing general supportive care which includes handling airway, breathing and oxygenation (oxygen saturation, pulse, and respiration), assessment of consciousness level, assessment of blood pressure, and blood sugar levels on emergencies. Diagnostic examination to determine risk factors including assessing blood sugar levels, cholesterol levels. Nurses can also conduct studies by analyzing the history of stroke patients such as a history of hypertension, diabetes mellitus and heart disease.

Method

This study used an observational analytic method with a retrospective design to look at several risk factors, by using medical record data from January 2016 to December 2017. The researchers conducted observations to determine the relationship between variables, namely blood pressure, pulse, respiration, GCS, blood sugar for a moment, blood cholesterol, history of hypertension, history of diabetes mellitus and a history of heart disease, then looked at the relationship to survival. 258 samples, taking samples with purposive sampling. Data collection is carried out for approximately 1 month. Data uses frequency distribution and multivariate tests using multinomial regression tests.

Results and Discussion

Table 1: Characteristic Distribution of Respondents

<table>
<thead>
<tr>
<th>No</th>
<th>Characteristic</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>36 – 45 years old</td>
<td>6</td>
<td>2.3 %</td>
</tr>
<tr>
<td>b.</td>
<td>46 – 55 years old</td>
<td>62</td>
<td>24.0 %</td>
</tr>
<tr>
<td>c.</td>
<td>56 – 65 years old</td>
<td>83</td>
<td>32.2 %</td>
</tr>
<tr>
<td>d.</td>
<td>&gt; 65 years old</td>
<td>107</td>
<td>41.5 %</td>
</tr>
<tr>
<td>2</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>male</td>
<td>149</td>
<td>57.8 %</td>
</tr>
<tr>
<td>b.</td>
<td>female</td>
<td>109</td>
<td>42.2 %</td>
</tr>
<tr>
<td>3</td>
<td>Job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>jobless</td>
<td>68</td>
<td>26.4 %</td>
</tr>
<tr>
<td>b.</td>
<td>housewife</td>
<td>31</td>
<td>12.0 %</td>
</tr>
<tr>
<td>c.</td>
<td>Farmer</td>
<td>42</td>
<td>15.3 %</td>
</tr>
<tr>
<td>d.</td>
<td>Private employees</td>
<td>56</td>
<td>21.7 %</td>
</tr>
<tr>
<td>e.</td>
<td>entrepreneur</td>
<td>40</td>
<td>15.5 %</td>
</tr>
<tr>
<td>f.</td>
<td>Government employees</td>
<td>20</td>
<td>7.8 %</td>
</tr>
<tr>
<td>g.</td>
<td>Laborer</td>
<td>1</td>
<td>0.4 %</td>
</tr>
<tr>
<td>4</td>
<td>Treatment duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>one day control</td>
<td>154</td>
<td>59.7 %</td>
</tr>
<tr>
<td>b.</td>
<td>≤ 1 week</td>
<td>75</td>
<td>29.1 %</td>
</tr>
<tr>
<td>c.</td>
<td>&gt; 1 week</td>
<td>29</td>
<td>11.2 %</td>
</tr>
</tbody>
</table>

Table 1. shows the highest number of respondents aged > 65 years as many as 107 people (41.4%), most respondents had male sex as many as 149 people (57.8%), most had ages 31-40 years as many as 79 people (69.3%), most worked as those who did not work, namely 68 people (26.4%) and most patients underwent control in outpatient care as many as 154 people (59.7%).

Table 2 Simultaneous Test of Multinominal Regression

<table>
<thead>
<tr>
<th>Model</th>
<th>-2 Log Likelihood</th>
<th>Chi-Square</th>
<th>Df</th>
<th>Nilai ρ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept only</td>
<td>486,375</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>237,382</td>
<td>248,993</td>
<td>22</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Table 2 shows a simultaneous test $\rho = 0.000$ or a value of $\rho$ sehingga $0.05$, so it can be concluded that there are at least one independent variable (systolic blood pressure, diastolic blood pressure, level of consciousness, momentary sugar levels, triglycerides and history of DM) that are significantly related to variables dependent (survival).

### Table 3 Partial Test of Multinomial Regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi-square</th>
<th>$\rho$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure</td>
<td>14,200</td>
<td>0.001</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>18,486</td>
<td>0.000</td>
</tr>
<tr>
<td>Respiratory (RR)</td>
<td>5,708</td>
<td>0.058</td>
</tr>
<tr>
<td>Level of Awareness (GCS)</td>
<td>76,083</td>
<td>0.000</td>
</tr>
<tr>
<td>Momentary blood sugar</td>
<td>8,404</td>
<td>0.015</td>
</tr>
<tr>
<td>Pulse</td>
<td>0,610</td>
<td>0.737</td>
</tr>
<tr>
<td>LDL</td>
<td>1,942</td>
<td>0.379</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>6,848</td>
<td>0.033</td>
</tr>
<tr>
<td>History of DM</td>
<td>10,460</td>
<td>0.005</td>
</tr>
<tr>
<td>History of HT</td>
<td>1,464</td>
<td>0.481</td>
</tr>
<tr>
<td>History of P. Heart</td>
<td>3,623</td>
<td>0.163</td>
</tr>
</tbody>
</table>

Table 3 shows a partial test that among the nine independent variables there are five variables (systolic blood pressure, diastolic blood pressure, level of consciousness, momentary base sugar levels, triglycerides and history of DM) that are significantly associated with the dependent variable (survival). This can be seen from the $\rho$-value variable systolic blood pressure ($\rho = 0.001$) and diastolic blood pressure variable ($\rho = 0.000$), Awareness Level (GCS) ($\rho = 0.000$), instantaneous blood sugar ($\rho = 0.015$), triglycerides ($\rho = 0.033$), and history of DM ($\rho = 0.005$). All of these variables have a value of $\rho \leq 0.05$. The conclusion that can be drawn is that the variables that are significantly related to survival are systolic blood pressure, diastolic blood pressure, level of consciousness, triglyceride momentary blood sugar levels and history of DM.

### Table 4 Multinomial Logistic Regression Analysis

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>Short-Term Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>SIGN</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>0,000</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>0,000</td>
</tr>
<tr>
<td>Level of Awareness (GCS)</td>
<td>0,000</td>
</tr>
<tr>
<td>Momentary blood sugar</td>
<td>0,006</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>0,007</td>
</tr>
<tr>
<td>History of DM</td>
<td>0,003</td>
</tr>
</tbody>
</table>

Table 4 shows the results of the multinomial regression obtained is that the variable ischemic stroke patients who have DM contribution in the short term who survive has an odd ratio value of -1,779 which means it is more appropriate than the short term compared to medium-term survival. Conclusions that can be drawn from ischemic stroke patients with DM participation have a chance of 1,779 times greater short-term survival compared with stroke patients.

### Table 5 Test the Goodness of the model

<table>
<thead>
<tr>
<th>Test the Goodness of the model</th>
<th>Pseudo R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cox and Snell</td>
<td>0.599</td>
</tr>
<tr>
<td>Nagelkerke</td>
<td>0.706</td>
</tr>
<tr>
<td>McFadden</td>
<td>0.484</td>
</tr>
</tbody>
</table>

Table 5 shows the Nagelkerke value of 0.706, which means the diversity of data on independent variables
(systolic blood pressure, diastolic blood pressure, level of consciousness, momentary base sugar levels, triglycerides and history of DM) in this study was able to explain the survival of 70.6% while the remainder is explained by other independent variables that are outside the research model.

**Discussion**

Based on the results of multinomial logistic regression, it was found that the dominant or most associated variables with short-term survival in ischemic stroke patients were blood pressure, level of consciousness (GCS), instantaneous blood sugar, triglycerides and a history of diabetes mellitus. The results obtained showed that strongest factor associated with survival was a history of diabetes mellitus with p value 0.003 and a coefficient of -1.777 which showed that the direction was negative. The meaning of the coefficient that is ischemic stroke patients who do not have diabetes mellitus (DM = 0) will cause a tendency to experience long-term survival. Ischemic stroke patients with a history of diabetes mellitus have a chance of 1,779 times greater experience of short-term survival compared to ischemic stroke patients who have increased systolic, increased diastolic, decreased GCS, increase in instantaneous blood sugar and increased triglycerides.

Based on the results of the coefficient, the strongest variable associated with short-term survival is a history of diabetes mellitus. The history of diabetes mellitus has a negative coefficient (B = -1.779) with p = 0.003 significant at α = 0.05. This explains that patients who do not have a history of ischemic stroke patients will tend to experience long-term survival. This is because diabetes mellitus has a hyperglycemia that can cause several events, namely atherosclerosis, aggregate platelets, and increased blood viscosity which triggers an increase in blood pressure and a buildup of plaque which will become an ischemic stroke. If these conditions occur in the long term / chronic, it will increase the deterioration of the patient’s prognosis and reduce survival, so patients tend to experience short-term survival. The results of studies that are in line convey that the history of diabetes is a risk factor associated with death in stroke patients. The Italian study showed that ischemic stroke patients increased the risk of in-hospital mortality and death by less than 30 days, so patients tended to experience short-term survival.

Blood pressure has a positive coefficient (B = 0.0074) for systolic blood pressure with p = 0.000, and for diastolic blood pressure (B = 0.118) with p = 0.000 significant at α = 0.05. This shows that the higher the blood pressure value of ischemic stroke patients it will cause the tendency of patients to experience short-term survival. Uncontrolled blood pressure and tend to increase can cause vasoconstriction of blood vessels, giving rise to the degree of constriction of blood vessels and trigger atherosclerosis. Weiss et al., (2018) explained in his study that systolic blood pressure which increased by > 160 mmHg had a relationship with an increased risk of short-term death to long-term death in ischemic stroke patients with elderly age. Based on this study systolic pressure ≥ 160 mmHg and diastolic ≥ 100 mmHg, ischemic stroke patients are at risk of experiencing short-term survival. Other studies that support a decrease in systolic blood pressure of 10 mmHg can reduce stroke incidence by 41%. (10)(12)(13)

GCS has a negative coefficient (B = -1.052) with p = 0.000 significant at α = 0.05. This explains that the higher awareness (GCS) in ischemic stroke patients will cause the tendency of ischemic stroke patients to experience long-term survival. Ischemic stroke patients have a greater chance of survival compared to hemorrhagic strokes. One reason for this is that patients with ischemic stroke tend to have moderate levels of consciousness good GCS > 8, so the recovery process does not need time which tends to be long. The Glasgow Coma Scale (GCS) is used to determine the level of awareness and severity experienced by stroke patients. The lower the GCS value indicates the more severe sensory, motoric and coordination disorders in the body. Shamshirgaran et al., (2014) explained a decrease in the level of consciousness factor influences independent predictors of early death of less than 30 days (short-term mortality). This can be concluded that the lower the level of awareness of patients, the more likely they will be to experience survival.

Momentary blood sugar (GDS) obtained a positive coefficient (B = 0.001) with p = 0.006 significant at α = 0.05. This shows that the higher the GDS value it will cause the tendency of ischemic stroke patients to experience short-term survival. The condition of hyperglycemia in the metabolic process affects mitochondrial function in the ischemic area of the penumbra. Hyperglycemia can lead to hypertension, atherosclerosis, heart disease and stroke. Uncontrolled hyperglycemia can worsen...
the prognosis of stroke patients, increasing the risk of only experiencing short-term survival. According to Wan-Arfah et al., (2018) in ischemic stroke patients with diabetes mellitus will tend to experience short-term survival compared to those without diabetes mellitus.⁹

Triglycerides obtained a positive coefficient (B = 0.011) with p = 0.007 significant at α = 0.05. This shows that the higher the triglyceride value it will cause the tendency of ischemic stroke patients to experience short-term survival.⁰ Based on the theory of increased triglyceride levels can be associated with an increased risk of vascular disease. Increased triglycerides in the blood associated with an increase in cholesterol and LDL in the blood can trigger atherosclerosis make LDL cholesterol in the arterial wall toxic and reduce the beneficial effects of HDL. Increased LDL cholesterol and triglycerides can trigger vascular diseases such as heart disease such as atrial fibrillation, can increase embolism which results in the expansion of infarction so that it can worsen the prognosis in stroke patients. Patients atrial fibrillation experience low survival and tend to experience short-term survival.

Conclusion

The dominant factors in short-term survival (<30 days) included increased blood pressure, hyperglycemia, decreased GCS, increased triglycerides and a history of diabetes mellitus can have a relationship with the incidence of short-term survival.

Ethical Clearance: This research has been conducted ethical conduct tests at the Ethics Committee of the Faculty of Medicine, Brawijaya University no. 371 / EC / KEPK-S2 / 12/2018.

Conflict of Interest: No conflict of interest

Source of Funding: Author

References


40. Available from:  http://jcvtr.tbzmed.ac.ir/Abstract/JCVTR_4063_20160813194442


Relationship between Type of Dysphonia and Quality of Life Based on Voice Handicap Index

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Abstract

Dysphonia has a significant impact on patients’ quality of life including psychological, social, physical, occupational, and communication to others. Voice Handicap Index is the most widely used instrument for measuring the quality of life for patients with dysphonia. The purpose of this study was to assess the relationship between type of dysphonia and quality of life based on voice handicap index. This study was conducted using cross sectional analysis to 12 normal subjects, 26 structural dysphonia subjects, and 10 neurogenic dysphonia subjects. Every sample had undergone video-stroboscopy examination to assess anatomical abnormalities of the larynx and vocal cords, and then we measure the Voice Handicap Index score. The result of the study showed that VHI scores on physical, functional, emotional and total scores were higher in neurogenic dysphonia compared to structural dysphonia subjects with p-value < 0.001. This indicated that the quality of life for patients with neurogenic dysphonia are worse than patients with structural dysphonia.

Keywords: dysphonia, video-stroboscopy, quality of life, voice handicap index

Introduction

Dysphonia is a terminology used for abnormalities characterized by changes in quality of sound, either by high and low pitches of sound, loudness, or efforts needed to produce sound that causes communication disturbance and associated with decreased quality of life. This condition can caused by abnormalities in phonetic organs especially larynx, both organic or functional. Dysphonia is not a disease, but a symptoms of disease or abnormalities on larynx (1).

In 2001, United State of America reported the prevalence of dysphonia about 0.98% (536,943 dysphonia patients per 55,000,000 total patients), in which they found more women patients compared to men (1.2%; 0.7%) with occurrence on the age of more 70 years old. In UK, around 50,000 patients per year came to ENT departement with dysphonia(2). Cohen et al (3) found that the prevalence for dysphonia was 0.98 from total study subjects with population of women 63.4% and male 36.5%.

A variety of disorders that can cause dysphonia such as nodules or vocal cord polyps, laryngo-pharyngeal reflux (LPR), vocal abuse, vocal cord paralysis, trauma, allergies, stress or depression, and congenital abnormalities. In 2015 Reiter reported that the most common cause of dysphonia were acute laryngitis (42.1%) and chronic laryngitis (9.7%), functional dysphonia (30%), benign (10.7%) and malignant tumor (2.2%), and neurogenic factor such as vocal cord paralysis (2.8 to 8%). Gusmarini et al have conducted a research at RSUP DR. M. Djamil Padang in 2010-2013, and the result showed that the most common cause of dysphonia was Gastroesophageal reflux disease (GERD) with 33.8% cases.(4,5)

There are several system that can be used to classify voice disorder. One of them divided voice disorder into 2 large groups, namely:...
Organic voice disorder: voice disorder which is physiological results from changes in the respiratory tract, laryngeal, or sound formation mechanism. Organic dysphonia is further divided into two groups:

Structural voice disorder is organic voice disorder caused by physical changes in sound formation mechanisms, for example changes in vocal cord tissue such as edema or vocal nodules, structural changes in the larynx due to aging.

Neurogenic voice disorder is organic voice disorder caused by disturbance of the central or peripheral nervous system to the larynx which affects sound.

Functional voice disorder is voice disorder caused by a disturbance in sound formation without any abnormalities in the larynx, for example vocal fatigue, muscle tension dysphonia.

Dysphonia have a significant impact on psychological, social, physical, work, and communication. The World Health Organization (WHO) defines disability (handicap) as limitation of participation from activities normally carried out by person due to physical impairment or injury. Severity of dysphonia and how dysphonia influence patient’s daily life is difficult to measure because that needed self evaluation in dysphonia management. (7)

Dysphonia impact on patients’ quality of life can be assessed by using some instruments. There are several instruments that have been developed to assess sound outcome such as Voice Handicap Index (VHI), Voice Outcome Survey (VOS), Voice Symptom Scale (VoSSS), Vocal Performance Questionnaire (VPQ), Voice-Related Quality of Life (V-RQOL), and Singing Voice Handicap Index (SVHI) (8). VHI is the most widely used instrument, which aim to evaluate dysphonia psychosocial impact. In 1997, Jacobson et al developed the Voice Handicap Index (VHI) which consists of 30 questions known as VHI-30, and on 2002 it has been validated by the Agency for Health Care Study and Quality. Quality of life assessment is very helpful in providing appropriate treatment for people with dysphonia. Patients who met the inclusion criteria were then asked to complete VHI questionnaire.

The VHI questionnaire was conducted to assess patients’ quality of life. The VHI score consists of 30 statements representing three subgroups, which reflect the functional, physical, and emotional aspects. Each statement must be read carefully and patients must be able to determine the frequency according to daily life, starting from 0 (never), 1 (rare), 2 (once in a certain period of time), 3 (often), to 4 (always). The range of VHI scores is between 0 and 120. VHI can be interpreted as mild (VHI score 0–30), moderate (31–60), and severe (61–120). Statistical tests were performed to determine the relationship between type of dysphonia and the VHI score.

Materials and Method

Research Time and Location

This study was conducted at ENT Head-Neck Surgery outpatient clinic of Hasanuddin University Hospital and Wahidin Sudirohusodo Hospital from January 2019 to March 2019.

Research Design and Variables

This study design is an analytical cross-sectional study. The variable is independent variable (type of dysphonia), dependent variable (Voice Handicap Index).

Population And Sample

The population in this study were all dysphonia patients who was admitted to ENT Head-Neck Surgery outpatient clinic of Hasanuddin University Hospital and Wahidin Sudirohusodo Hospital from January 2019 to March 2019. The samples were all subjects from the population who met the inclusion criteria.

Data Collection Method

Data collection was carried out by taking demographic data including, sex, age, job and routine otorhinolaryngology examination such as otoscopy, anterior rhinoscopy, pharyngoscopy, and laryngoscopy. Patients who are willing to take part in the study are asked to fill out informed consent, then video-stroboscopy is performed to assess abnormalities in the larynx and vocal cords. Patients who met the inclusion criteria were then asked to complete VHI questionnaire.

The VHI questionnaire was conducted to assess patients’ quality of life. The VHI score consists of 30 statements representing three subgroups, which reflect the functional, physical, and emotional aspects. Each statement must be read carefully and patients must be able to determine the frequency according to daily life, starting from 0 (never), 1 (rare), 2 (once in a certain period of time), 3 (often), to 4 (always). The range of VHI scores is between 0 and 120. VHI can be interpreted as mild (VHI score 0–30), moderate (31–60), and severe (61–120). Statistical tests were performed to determine the relationship between type of dysphonia and the VHI score.

Results

A cross sectional study was conducted to assess the
relationship between types of dysphonia and quality of life based on Voice Handicap Index (VHI). This study was conducted on people with dysphonia in ENT Head-Neck Surgery outpatient clinic, Hasanuddin University Hospital, Makassar from January 2019 - March 2019.

During this period, we obtained 48 samples consists of 22 men (45.8%) and 26 women (54.2%) with 11 patient in age group < 31 years old (22.9%), 20 patient in 31-40 years age group (41.7%), and 17 patients > 40 years old (35.4%). Based on work, we obtained 5 professional user (10.4%) and 43 non-professional user (89.6%).

Figure 1. Type of Dysphonia Based On Video-stroboscopy Examination

Video-stroboscopy showed that the most common type of dysphonia was 26 structural dysphonia (54.2%), 12 normal (25.0%), and 10 neurogenic dysphonia (20.8%) (Figure 1). Table 1 shows that the proportion of subjects with a severe VHI score was found to be higher in women (26.9%) compared to men (13.6%). Table 2 shows that the proportion of subjects with severe VHI scores was found to be highest at 31-40 years of age (35.0%) and the lowest at <31 years old (9.1%).

Table 1. Relationship between Gender and Severity of VHI

<table>
<thead>
<tr>
<th>Observation n (%)</th>
<th>VHI Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>male</td>
<td></td>
</tr>
<tr>
<td>female</td>
<td></td>
</tr>
</tbody>
</table>

*Kruskal –Wallis

Discussion

This study shows that there is a relationship between type of dysphonia and quality of life based on the voice handicap index.

Gender distribution is more common in women than for men. This result is not very different compared to Caroline’s study with a comparison of men (35.5%) and women (64.5%), as well as Hummel’s study with total men (35) and women (51). However, this result was different to Gusmarini which showed that the incidence of dysphonia is comparable to men and women 1: 1. Based on the results of these studies, we concluded that gender does not affect the incidence of dysphonia. (5,11,12)

The highest frequency of patients with dysphonia is between of 31-40 years with 20 (41.6%) patients, followed by the age group above 40 years with 17 (35.4%) patients, and the lowest is < 30 years age group with 11 (22.5%) patients. This result is different from study reported by Caroline, et al showed that the highest frequency of patients with dysphonia is in age group above 40 years, and Haryuna who reported the highest percentage of patients with dysphonia is in age group over 60 years. This is due to the fact that in that study the cause of dysphonia was laryngeal malignancy whereas in this study more cases were caused by laryngopharyngeal reflux. (11,13)

In this study the most common laryngeal disorder was structural dysphonia (54.2%). The results of this study is likely due to Wahidin Sudirohusodo Hospital and Hasanuddin University Hospital being a reference center in Eastern Indonesia, so that structural abnormalities that require more operative treatment are referred to both those hospitals. This study is in line with the study from Kiakojoury et al. (14) which also found that the
most common cause of voice disorders was organic dysphonia (85.78%), functional dysphonia (8.6%), and dysphonia due to neurological disorders (5.6%). Cohen, et al reported that the most common diagnosis for patients with voice disorders was LPR (3). Gusmarini stated that the underlying causes of dysphonia were LPR (33.8%), vocal cord paralysis (23.5%), and Laryngeal TB (10.3%5).

Comparison between male and female VHI scores was found to be higher in female. This shows that the quality of life in female is worse than that of male. This study result is supported by a study reported by Bogusz, et al which stated that VHI scores were significantly higher in women than men with p-value < 0.05 (15). According to the literature there is a difference between men’s and women’s quality of life, where men’s quality of life tend to be better than women. Both men and women have differences in roles and access to and control of various sources so that the needs or things that are important for men and women will also be different. This indicates a different aspect of life related to quality of life in men and women, for example communication. Women are more likely to socialize and use sounds, so they feel more disturbed when there is a change in their sound.

The highest VHI score was found at the age group 31-40 years (35.0%) . This is due to the age group 31-40 years is still in productive age, which is still active in social and economy. The results of this study are parallel with study conducted by Caroline (11) who reported that at the age of < 40 years, total VHI score was higher than in those aged more than 40 years.

Comparison of VHI scores based on the type of dysphonia using Kruskal-Wallis test shows that the highest mean functional score were found on neurogenic dysphonia (23.8). The highest mean physical score were found on neurogenic dysphonia (23.2). The highest mean emotional score were found on neurogenic dysphonia (23.2), and mean total VHI score were found highest on neurogenic dysphonia (70.2). The results of the total score and subscale have significant differences with p values < 0.001. Patients with vocal cord paralysis have poor quality of life that may be caused by the impact of vocal cord paralysis not only causing voice impairment, but also disturbing other daily activities such as lifting, straining, and swallowing. This results showed that overall severe quality of life disturbances were related to neurogenic dysphonia abnormalities.

Bogusz et al (2011) stated that the highest total VHI score and subscale were found in patients with vocal cord paralysis, and the lowest score in patients with benign vocal cord tumors. While the comparison between scales found that the highest average VHI score was recorded in the physical subscale and the lowest in the functional subscale (15). Amir, et al (2006) reported that patients with neurogenic dysphonia had the highest total VHI score, and the lowest score was found on dysphonia that were caused by inflammation compared to other pathological abnormalities with p-value < 0.05 (16). Study conducted by Lam, et al (2006) states that in both VHI-30 and VHI-10, the total score of neurogenic group is significantly higher than in the structural group, and that the structural group has higher score compared to the inflammatory group (17). It shows that abnormalities in the larynx that cause speech disorders have an impact on patients’ quality of life both physically, functionally, and emotionally. Therefore the treatment of patients with dysphonia must be done in a multidisciplinary approach by looking at the scores of each subscale. Physical disorders can be treated with surgical and medical treatment, functional disorders can be treated with vocal rests and speech therapy, and emotional disorders can be handled by counseling.

**Conclusion**

This study result shows that the most common cause for dysphonia based on video-stroboscopy examination is structural dysphonia. The value of the voice handicap index score on neurogenic dysphonia is higher than structural dysphonia both in functional, physical, emotional, and total scales. This shows that the quality of life in patients with neurogenic dysphonia is worse than structural dysphonia, so it can be concluded that the assessment of quality of life using Voice Handicap Index can be used as a supporting tool in choosing the right treatment for people with dysphonia.

**Conflict of Interest**: Authors declare that there is no conflict of interest within this publication.

**Ethical Clearance**: Ethical clearance was made by Medical Faculty, Hasanuddin University, Makassar.

**Source Funding**: Source funding came from the authors their selves.
References


Factors Affect the Quality of Health Services of National Health Insurance Participants (Studies Public Health Center Benteng in The City Palopo)

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¹Associate Professor, ²Graduate Study program, Institute of Higher Health Education, Mega Buana Palopo, Indonesia

Abstract

Public Health Center as the first level health facility is expected to improve and enhance public health. Where workers or health workers in Public Health Center has a role and a great responsibility on public health issues. Especially in terms of providing quality health services to the community. To determine the factors that affect the quality of health services of national health insurance participant in the public health center Benteng Palopoin 2016. The type of research was a survey research that used a structured or systematic question to many people, and then all of the answers that obtained are recorded, processed and analyzed by using a cross sectional research design. The results of statistical analysis obtained by value $\rho = 0.000 < \alpha = 0.05$ means that H0 rejected and Ha accepted that there is an influence on the technical competence of health care quality of national health insurance participants. Results of statistical analysis obtained by value $\rho = 0.004 < \alpha = 0.05$ means that H0 rejected and Ha accepted that there is an influence on the effectiveness of health care quality of national health insurance participants. Results of statistical analysis obtained by value $\rho = 0.000 < \alpha = 0.05$ means that H0 rejected and Ha accepted that there was an effect on the efficiency of health care quality of national health insurance participants. Factors that affect the quality of health services of national health insurance participant in the public health center Benteng Palopoin 2016, namely technical competence, effectiveness, and efficiency.

Keywords: quality of service, technical competence, effectiveness, efficiency.

Introduction

Based on data from the Palopo City Health Office in 2015, the number of contribution recipients (PBI) JKN from the regional expenditure (APBD) budget was 51,000, the recipients of contributions from the state expenditure budget (APBN) were 45,614 ¹. Based on data from the Benteng Kota Palopo Health Center in 2015, the number of JKN beneficiary beneficiaries (PBI) participants was 7,307, and there were 9,000 independent JKN participants, of which there were 18,603 residents of Benteng Community Health Center². Then, out of this total, 51% did not claim to be dissatisfied with doctors’ services, while the rest were not satisfied with hospital services³. Especially for efforts to develop service quality in hospitals and health centers also known as Clinical Gofernance⁴-⁶. The JKN program was underway at the Benteng City Palopo Health Center. Seeing the number of patient visits has decreased in the last three years, it is necessary to know how the quality of services at the Benteng Health Center. Based on the background of the above thoughts, the researchers were interested in examining the factors that influence the quality of health services for participants of the National Health Insurance at Benteng Kota Palopo Health Center in 2016

Materials and Method

Research Design

Research design is a method used by researchers to conduct a study that gives direction to the course
of research. The type of research used is a survey that is a study that uses the same structured or systematic questions to many people, then all the answers obtained by researchers are recorded, processed and analyzed. By using a cross sectional study design that is the type of research that emphasizes the time of measurement or observation of data of independent and dependent variables only once.

**Research Location**

This research was conducted at the Puskesmas Fort Palopo.

**Research Time**

This research was conducted in May to June 2016.

**Population**

The population in this study were all outpatients who used the National Health Insurance who came for treatment at the Benteng Health Center in January-March 2016, which was 2,700 people.

Samples. The sampling technique carried out in this study was simple random sampling by randomly drawing out the numbers and that was used as a sample of 96 people.

**Results**

a. Quality of Service

**Table 1. Distribution of Respondents Based on Quality of Service at the Benteng City Palopo Health Center, 2016**

<table>
<thead>
<tr>
<th>Quality of Service</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualified</td>
<td>93</td>
<td>96.9</td>
</tr>
<tr>
<td>Not Qualified</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>

In table 1 shows that of the 96 respondents studied, respondents who stated that quality services were 93 respondents (96.9%) and respondents who stated they were not as qualified as 3 respondents (3.1%).

b. Technical Competence

**Table 2. Distribution of Respondents Based on Technical Competence at the Benteng City Palopo Health Center in 2016**

<table>
<thead>
<tr>
<th>Technical Competence</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence</td>
<td>93</td>
<td>96.9</td>
</tr>
<tr>
<td>Not Competence</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>

In table 2 shows that of the 96 respondents studied, the number of respondents who said that there were 93 competent (96.9%) competent technical competencies and 3 respondents (3.1%) who were incompetent.

c. Effectiveness

**Table 3. Distribution of Respondents Based on Effectiveness at the Benteng City Palopo Health Center In 2016**

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiv</td>
<td>89</td>
<td>92.7</td>
</tr>
<tr>
<td>Not Effectiv</td>
<td>7</td>
<td>7.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>

In table 3 shows that of the 96 respondents examined, the number of respondents who said effectiveness was effective 89 respondents (92.7%) and respondents who said no effective as many as 7 respondents (7.3%).

d. Efficiency

**Table 4. Distribution of Respondents by Efficiency at the Benteng City Palopo Health Center**

<table>
<thead>
<tr>
<th>Efficiency</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient</td>
<td>88</td>
<td>91.7</td>
</tr>
<tr>
<td>Not Efficient</td>
<td>8</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>
In table 4 shows that of the 96 respondents examined, the number of respondents who stated efficient efficiency 88 respondents (91.7%) and respondents who said no efficient as many as 8 respondents (8.3%).

**Bivariate Analysis**

a. Effect of Technical Competence on Quality of Health Services

Table 5. Effect of Technical Competence on Quality of Health Services Participants in the National Health Insurance at Benteng Health Center City of Palopo in 2016

<table>
<thead>
<tr>
<th>Technical Competence</th>
<th>Quality of Health Services</th>
<th></th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qualified</td>
<td>Not Qualified</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>91</td>
<td>94.8</td>
<td>2</td>
<td>93</td>
</tr>
<tr>
<td>Not Competence</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>94.8</td>
<td>5</td>
<td>96</td>
</tr>
</tbody>
</table>

Uji Regresi, Crosstab

From the results of statistical analysis using linear regression obtained the value of $\rho = 0.000 <\alpha = 0.05$, means that H0 is rejected and Ha is accepted so that there is an influence of technical competence on the quality of health services National Health Insurance participants in the Benteng community health center in Palopo.

d. Effect of Efficiency on Quality of Health Services

Table 7. Effect of Efficiency on the Quality of Participant Health Services National Health Insurance at Benteng Health Center City of Palopo in 2016

<table>
<thead>
<tr>
<th>Efficiency</th>
<th>Quality of Health Services</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qualified</td>
<td>Not qualified</td>
<td>Total</td>
</tr>
<tr>
<td>Efficient</td>
<td>88</td>
<td>91.7</td>
<td>0</td>
</tr>
<tr>
<td>Not efficient</td>
<td>3</td>
<td>3.1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>94.8</td>
<td>5</td>
</tr>
</tbody>
</table>

Uji Regresi, Crosstab

From the results of statistical analysis using linear regression obtained value $\rho = 0.000 <\alpha = 0.05$, means that H0 is rejected and Ha is accepted so that there is an effect of effectiveness on the quality of health services for participants of the National Health Insurance in Benteng City Palopo.

**Discussion**

Effect of Technical Competence on Quality of Health Services

The distribution of respondents based on technical competency in Benteng Health Center in 2016 was obtained by 96 respondents studied, the number of respondents who said that competent technical competence was 93 respondents (96.9%) and respondents who said they were incompetent were 3 respondents (3.1%) Many respondents agreed that all this time the services provided by Benteng Community Health Center in terms of technical competence were very good, both in terms of the readiness, appearance and skills of officers in providing services.

The influence of technical competence on the quality of health services for national health insurance...
participants at Benteng Kota Palopo Health Center in 2016 the results of statistical analysis using linear regression obtained a value of $\rho = 0.000 < \alpha = 0.05$, meaning $H_0$ was rejected and $H_a$ was accepted so that there was influence technical quality of health services for participants of the National Health Insurance. This is because patients feel that the technical competencies possessed by doctors, nurses, and other non-medical officers in serving patients at Benteng Health Center are good because the respondent answers to technical competencies that have the responsiveness / speed of health workers in handling patient complaints and provides solutions, the availability of doctors and nurses to serve patients and routinely control the patient’s condition, in addition to the attitude of the health staff, the complete condition of the equipment at the Benteng Health Center is still standard, but this is not too significant, because the equipment in the puskesmas is appropriate with service operational standards.

Effect of Effectiveness on Quality of Health Services

The respondent’s distribution based on effectiveness at Benteng Kota Palopo Health Center in 2016 was obtained from 96 respondents studied, the number of respondents who said that the effectiveness was 89 respondents (92.7%) and respondents who stated ineffective were 7 respondents (7.3%). Judging from the dimensions of effectiveness as many as 89 people (92.7%) owned by health workers in the Puskesmas are already in the effective category which illustrates that health workers have provided maximum service based on their scientific background ability and satisfaction. The dimensions of effectiveness in this study are based on the assessment of patients on aspects of patient examinations carried out regularly, giving explanations at the beginning before carrying out the action, giving encouragement in terms of healing, deft in carrying out various actions and being able to complete the task independently.

The effect of effectiveness on the quality of health care services for national health insurance participants at Benteng Health Center in 2016, the results of statistical analysis using linear regression obtained a value of $\rho = 0.000 < \alpha = 0.05$, meaning $H_0$ is rejected and $H_a$ is accepted so that there is an effectivity on service quality health of participants of the National Health Insurance.

The results of this study are in line with the research conducted by on the analysis of inpatient satisfaction at Lanto General Hospital. Pasewang where there is a significant relationship between human relations (effectiveness) and patient satisfaction with and the results of statistical tests obtained a value of $\rho = 0.001$, his research explains that good human relationships will instill trust and credibility by respecting, keeping confidential, respectful, responsive and giving attention, listening to complaints and communicating effectively are also important. Relationships between good people will have a big contribution in effective counseling. Poor human relations will reduce the effectiveness of technical competencies in health services. Patients who are treated poorly tend to ignore the advice and advice of health workers. The presence of patients who are satisfied with the services of the officers is that they are quickly served by the clerk.

Effect of Efficiency on Quality of Health Services

The distribution of respondents based on efficiency at Puskesmas Benteng in 2016 was obtained from 96 respondents studied, the number of respondents who stated efficient efficiency was 88 respondents (91.7%) and respondents who stated inefficient as many as 8 respondents (8.3%) . This can be caused by patients feeling that health workers provide services according to the procedure with the promised time right in providing good service when doing registration, drug collection and health workers provide an explanation of the rules for using drugs according to the prescription given by the doctor. While respondents who stated the efficiency of the dominant inefficient staff were also distributed to the quality of health services in the quality category as much as 5 (5.2%). If reviewed in more depth, the achievement figures need special attention. The lack of efficiency possessed by health workers at the health center including nurses who provide services to patients can affect the quality of services held.

On table 7 the effect of efficiency on the quality of health care services for national health insurance participants at Benteng Kota Palopo Health Center, the results of statistical analysis using linear regression obtained a value of $\rho = 0.000 < \alpha = 0.05$, meaning $H_0$ was rejected and $H_a$ was accepted so that there was an effect of efficiency on service quality health of participants of the National Health Insurance with the interpretation
that there is an influence of the efficiency of officers on the quality of health services where the number of responsive officers in providing services is an element that influences the patient’s assessment of the quality of services held. Suprapto’s research\textsuperscript{13} states that the ease of administration with the accuracy of working hours of health workers in providing services has a significant effect on patient satisfaction at Sragen District Hospital.

The results of this study are in line with the research conducted by Nur Ifah Intan Suaib\textsuperscript{14} with the title Relationship between the quality of health services and satisfaction of BPJS patients in Luwu District Hospital. The results of statistical tests using fisher’s exact text obtained a probability value ($\rho = 0.000$). The probability value obtained is $\rho <0.05$, then the null hypothesis is rejected or there is a significant relationship between efficiency and satisfaction of BPJS patients in Luwu District Hospital.

**Conclusion**

Based on the results of data analysis and discussion of the results of research on factors that affect the quality of health services for participants of the National Health Insurance at Benteng City Palopo Health Center in 2016, conclusions can be drawn as follows:

1. There is an influence of technical competence on the quality of participant health services National Health Insurance at Benteng Community Health Center in Palopo City. The results of the linear regression statistical analysis, the value of $\rho = 0.000 <\alpha = 0.05$ means that $H_0$ is rejected and $H_a$ is accepted.

2. There is an effect on the effectiveness of the quality of health care for participants in the Guarantee National Health at Benteng Community Health Center in Palopo City. The results of the linear regression statistical analysis, the value of $\rho = 0.004 <\alpha = 0.05$, means that $H_0$ is rejected and $H_a$ is accepted.

3. There is an effect of efficiency on the quality of health services for participants of the National Health Insurance at the Benteng Health Center in Palopo City. The results of the linear regression statistical analysis, the value of $\rho = 0.000 <\alpha = 0.05$, means that $H_0$ is rejected and $H_a$ is accepted.

**Ethical Clearance** - Taken from Institute committee of ethical clearance

**Source of Funding** - Self

**Conflict of Interest** – None

**References**


Policy Concept of Public Health Services on Regionalization of JKN Referral Systems in Border Areas

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Abstract

The purpose of this study was to examine and analyze the concept of public health service policy offerings for the regionalization of the national health insurance referral system in the district / city border area in South Sulawesi Province. Research methods. This study used qualitative and carried out in three government agencies, namely the South Sulawesi Provincial Health Office, Daya Regional Hospital and Wahidin Sudiro Husodo Hospital as Tertiary Hospitals. Data retrieval was carried out from September 2016 to May 2018 with in-depth interviews as primary data and retrieving documents as supporting data in related institutions as secondary data. Determination of informants with purposive sampling technique. Data collection is done by in-depth interviews, observation, focus group discussions (FGD). Data analysis was carried out qualitatively descriptive by obtaining data / information from informants, describing data records, then preparation of analysis by reducing data to meaningful and more concise information, the way is to do coding or code then summarize again in the form of categories and relationships between categories, studies This uses 4 ways to increase trustworthiness, namely; thick description, negative case analysis, triangulation, member checking. Results. The community considers the regionalization of the referral system makes it difficult for people in border areas, besides very far access, sometimes it is very difficult to reach, the costs incurred are far more expensive, seem complicated, if people follow queues sometimes for long periods, in primary services such as clinics / health centers.

Keywords: Health Referral System, Regionalization, National Health Insurance

Introduction

Government policies, especially health policies, can be influenced by the political, economic and cultural conditions of the community in accessing health services with a tiered service system, especially in border areas between provinces and between districts / cities, one region or another region. Health insurance is a guarantee in the form of health protection so that participants get the benefits of health care and protection in meeting basic health needs given to everyone who has paid contributions or fees paid by the government. The National Health Insurance as a National Health Sector Program which was enacted on January 1, 2014 as an effort to overcome various problems related to health services. According to Ribot and Peluso access is the ability to benefit from something or the right to obtain something power. Whereas according to Schlager and Ostrom. Definition of access is the right to enter, use, and utilize certain regions or zones. Increased access to health services is one proof of the government’s seriousness in improving the quality of public health services. Organizational climate is very influential on the support of team performance, motivation, and values of the community and the government as a motivator, regulator of the implementation of health services for every citizen. Facilitating chronic disease sufferers in accessing health services by reducing queues for chronic disease participants. Complementing health facility needs and increasing the competence of health workers.
in all regions of Indonesia, so as to be able to handle cases according to the level of service, one of which is to reduce unnecessary referral cases. Primary health care or primary health care acts as a gate keeper where first person or community contact with health services occurs.

Materials and Method

The research method used is qualitative research. This research explores more about access to hospital referral systems in the border areas in South Sulawesi. The focus of this study is on developing a tiered Hospital Referral System Regionalization Model on the National Health Insurance (JKN) in border areas for medical and non-medical staff in regional hospitals and tertiary hospitals, as well as provincial health offices. The Basics of Qualitative Research is constructivism which assumes that reality is plural, interactive and an exchange of social experiences interpreted by each individual.

Results and Discussion

General description of the people of South Sulawesi

South Sulawesi Province is located at 0° 12' - 8° South Latitude and 116° 48' - 122° 36' East Longitude. The area is 62,482.54 km². Administratively, the boundaries of the South Sulawesi Province: North side with Central Sulawesi Province, West side with Makassar Strait, East side with Bone Bay and South side with Flores Sea. The area is 62,482.54 km² (42% of the total area of the island of Sulawesi and 4.1% of the total area of Indonesia). South Sulawesi has a strategic location in Eastern Indonesia allowing South Sulawesi to function as a service center, both for Eastern Indonesia and internationally. The Makassar tribe itself consists of several sub-tribes that are widespread in the southern part of Sulawesi island, spread from Makassar City, Gowa Regency, Takalar, Jeneponto, Bantaeng, Bulukumba, Selayar, Maros, and Pangkep. The sub-tribes are, for example, the Makassar Lakiung tribe, Turatea (the Jeneponto and Bantaeng tribes), the Konjo Tribe (Bulukumba and Part of Maros), and the Selayar Tribe.

Geographical Location / border problems of an area

The regionalization of the referral system is the answer that indeed this program has long been issued by the Government of South Sulawesi long before there was a central government program called JKN, which was the first and best South Sulawesi and JAMKESDA service model to be in line with the time of cultural development. Current cultural socialization with regionalization, some people consider, this is no longer appropriate, there needs to be a model development, even some informants say the regionalization of the JKN referral system violates human rights, the problem for regions where development is approaching prosperity, because the system is limiting and not give the same rights to each region both in the development of health facilities and human resource development so that everyone to do, provide services, get the same health services. Based on the results of interviews with informants R1, R2, as stated in the following:

Informant R1 assumed that the information provided was data in accordance with the objectives of the hospital referral system realization during the Jamkesda period, Jamkesmas, better known as Pergub (governor’s regulation) South Sulawesi Number 15 of 2008, which had an JKN referral system supported by interviews with informants. R2, which states that:

The Jeneponto community that borders Bantaeng prefers Bantaeng to seek treatment, feeling secure, fast, access to services is far better the consequences are not borne by the BPJS because it does not follow the tiered SOP referral system, hoping that in the future there will be a joint rule or MOU region wherever, whenever he is sick, it is important that he is registered as a member of the BPJS and has fulfilled his obligations according to Universal Health Coverage (R26)

The concept of American health policy is that every border area must have Hospital Post, which is a hospital that serves the community between two border areas far from one district to another, our country has not yet been able to make policies, conceptualize integrated referral system policies or Joint MOU that communities near other cities can do hospital services such as Barru patients with Pare pare, Takalar near Gowa, where health facilities are closer, as well as other areas throughout South Sulawesi (R13 45 years)

The distance and travel time of my research and your research and supporting theories or refute my results. Furthermore, distance and travel time, based on the results of interviews in research obtained or found through the South Sulawesi provincial Health Agency, Wahidin Hospital Sudirno Husodo (Ka UGD), and Daya Hospital and experts assume and argue almost
the same as the social phenomenon in health services. The following is an interview quote from the informant R1, R2: To break the distance chain very far so that public health services are faster to health facilities, automatically the community benefits more, transportation costs, expenses and financing for the patient’s family are reduced, the Pergub continues to run in the BPJS shutter and provides quality and high quality health services. there is an MOU between two regions (R1, R2), because access is easier, the people of Soppeng who want to be referred prefer to go to Pare-pare Hospital compared to Bone Hospital as well as distance, have arrived at Pare Pare Hospital, but have not traveled to Bone (R26) Hospital.

The same thing was said by R2 and 3 other informants who also objected to the policy on regionalization of hospital referral systems due to research that said the program did not work in accordance with the objectives of the flagship program than Governor Sahrul Yasin Limpo as the following: There is no analysis of distance and travel time when determining the region in the regionalization policy of the referral system so that the distance between one region to another is very far in one region, causing the community to choose the closest health facilities even though it is risky because they have to pay for the services they receive or become a general patient (R2, R3, R5, R7).

He was the former head of the health department for 5 periods, he was very critical of the policies issued by the Governor of South Sulawesi and his statement: The Tolo community in Jeneponto Regency to the mountains prefers to cross to Bantaeng because it is close and the feeling of comfort is handled directly by a specialist doctor, even though it is not borne by the BPJS to be a general patient (R13, R14).

**Accessibility of Health Services**

The limited facilities, infrastructure, governance of human resources of health workers are a classic problem in health services, especially in South Sulawesi and in Eastern Indonesia and in Indonesia as general as possible. The government has carried out various efforts to improve access to health services both from the aspect of infrastructure, strengthen the health care system through financing mechanisms, referral systems, human resource development and distribution of health personnel.

Health service access is then linked to the concept of equity (fairness) or the concept of justice in health services is defined as eliminating the difference in health services provided to all communities regardless of RAS social status and religion and belief flow. Equity means that all communities have the right to get equality in accessing health services according to their needs, the equality of utilization of health services in common health outcomes.

The term equity is divided into two, namely horizontal equity and vertical equity. Horizontal equity related to health services in the community by that in certain cases the community must get the same treatment for the same needs. Whereas vertical equity is the fulfillment of rights to health services must be adjusted to the proportion and needs, in accordance with the diagnosis of the disease they suffer or assuming that people who need complex treatment means entitled to more perfect health services.

A figure as well as Head of the South Sulawesi Provincial Health Office and at the same time the initiator of the issuance of Pergub No. 15 of 2008 on Hospital Regionalization of the Referral System at the time of the Free Health health service is still in terms of what we call JAMKESMAS and JAMKESDA. yes it was made and still applied after the health service system from JAMKESMAS integrated into JKN as which was assumed by the informant R1 and 11 following:

Besides the reasons for being closer and very young to reach, the people of the western part of Soppeng Regency, Soppeng Batu Batu, are adjacent to Sidrap Regency, assuming referrals to Pare Pare Hospital are younger, compared to Bone City, as well as in Luwu with characteristics of Luwu region. walenrang and the characteristics of all of South Sulawesi which are not owned by other regions or other provinces in Indonesia (R1 59 years, R2, 45 years). The pros and cons of the regionalization of the current JKN referral system are as stated by the informants as follows:

If there is no in-house room, Sisrute is looking for, communicating throughout the hospital that is collaborating with Wahidin and Sisrute Hospital which plays a role until there is a response, because the patient arrives at the referral but there is no treatment room so there must be info on facilities and infrastructure even certain things if there is a patient who needs a specialist,
sisrute can help so that it can improve the quality of hospital services (R14).

To be able to access the referral, the BPJS policy must be permitted, because the quota system in an area such as Rp. 99 thousand is paid here means that the money is here if it is to be serviced within a month or not. those who come don’t care who they will be treated the same, so, the policy is that people must be able to report to BPJS or other parties (R18).

**Conclusion**

Actually regionalization of the referral system needs to be revised, there is no need for regions in terms of health services, wherever whenever an important sick community is registered with BPJS participants the BPJS is obliged to serve it, so regionalization of the JKN referral system is only for health facility development and health HR development. The concept of health policy in America, every border area must have a health post or hospital post, namely hospitals that serve the community between two border areas that are far from one district to another, our country has not yet been able to conceptualize regionalization system integrated referrals or Joint MOUs such as Barru patients with Pare pare, Takalar near Gowa, where health facilities are closer, as well as other areas throughout Indonesia (R45)

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Obtained from Facultu of Public Health, Hasanuddin University

**References**


5. Creswell JWU of NB. *Planning, Conducting, and Evaluating Quantitative and Qualitative Research.*


Microbiome Alterations on Incidence Chronic Rhinosinusitis with Nasal Polyps of Indonesians

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Abstract

Background: Affects approximately 10% of general population, leads to decrease quality of life, lost productivity as well as increase financial burden to society. Chronic rhinosinusitis with nasal polyps (CRSwNP) recognize as a benign nasal growths that usually arise as a result of chronic paranasal sinuses inflammation. Alteration of microbial composition may cause increasing the incidence of allergic disorders and contribute to the development and chronicity of inflammatory disease

Objective: Investigate histopathology of nasal polyps and nasal microbiome in chronic rhinosinusitis with nasal polyps of Indonesians

Materials and Method: This study was conducted using the case control technique on 10 patients of CRSwNP. All of the samples examined by next generation sequencing technique and nasal polyps histopathological examination.

Results: The non eosinophillic type is a dominant in CRSwNP while Actinobacteria, Bacteroidetes, Cyanobacteria, Firmicutes, Fusobacteria, and Proteobacteria were the dominant phylum in CRSwNP with variation number of percentage.

Conclusion: This study highlights alteration of microbial composition of CRSwNP and its histopathological examination.

Key Words: Chronic Rhinosinusitis, CRS, CRSwNP, Microbiome, Proteobacteria, Histopathology, Dysbiosis

Introduction

Chronic rhinosinusitis (CRS) is a chronic inflammatory disease of the nose and paranasal sinuses around 8-12 weeks defined by two symptoms, nasal blockage/obstruction/congestion, nasal discharge, facial pain/pressure, and/or reduction or loss smell with endoscopic examination or relevant CT scan changes.1,2 Affects approximately 10% of general population, leads to decrease quality of life, lost productivity as well as increase financial burden to society and causing to a further than a million operative interferences per year worldwide.3

Two main category of chronic rhinosinusitis based on absence or presence of nasal polyps (CRSsNP; Chronic rhinosinusitis without nasal polyps and CRSwNP; Chronic rhinosinusitis with nasal polyps)1,3

Chronic rhinosinusitis with nasal polyps (CRSwNP) recognize as a benign nasal growths that usually arise as a result of chronic paranasal sinuses inflammation.4 In Western countries, most of the nasal polyps are eosinophilic while in East Asian countries are noneosinophilic types.

Despite late research evidence that conduces to advance revealing the pathophysiology of these chronic...
airway conditions, the cause remains badly understood and seems to be multifactorial. The microbiome concept emerged to be one of the mechanisms contributing to the inflammation of CRS. Numerous studies indicate that changes in the airway microbiota may be affiliated with inflammatory process.\(^5\)

It is generally considered that the presence of microorganism on airway mucosal surfaces may compromise health. Microbiome has major roles in a healthy environment, the more bacteria existence as a richness, diversity and evenness, the healthier will be. Alteration of microbial composition may cause increasing the incidence of allergic disorders and contribute to the development and chronicity of inflammatory disease.\(^6\)

Here, we investigate histopathology of nasal polyps and nasal microbiome in chronic rhinosinusitis with nasal polyps of Indonesians.

**Material and Method**

**Ethics Statement, Study Design and Patient recruitment**

Diagnosis of Chronic rhinosinusitis was made according to The European Position Paper on Rhinosinusitis and Nasal Polyps.\(^1\) CRSwNP patients were informed about the study and invited to participated, scheduled for endoscopic sinus surgery on all paranasal sinuses for the treatment of CRS. Written informed consent was obtained from all participants. Diagnosis of CRS was made according to the European Position Paper on Rhinosinusitis and Nasal Polyps 2012. Exclusion criteria included Immunodeficiency, sinonasal malignancies and tumor, Atroficans rhinitis, patients with previous surgical history and age <18 years old.

The study protocol and ethical clearance was approved by Biomedical Research Ethics Committee on Human Faculty of Medicine Hasanuddin University, Makassar, Indonesia (Register number:14/UN4.6.4.5.31/PP36-KOMETIK/2019).

Study participants were conducted in 2019 at Wahidin Sudirohusodo Hospital, Hasanuddin University Hospital and Mitra Husada Hospital Departement of Otorhinolaryngology, Head and Neck Surgery, Hasanuddin University, Makassar, Indonesia.

**DNA Extraction Library Preparation and Sequencing**

Entire genome DNA by samples was elicited using CTAB/ SDS method. DNA concentration and purity was monitored on 1% agarose gels. Conording to the concentration, DNA was diluted to 1ng/µL using sterilised water.

Amplification of the 16S rRNA gene V3-V4 region was executed by using specific primers designed to anneal to 341F and 806R. This resulted in amplicon sizes around ~466bp. All further steps in library preparation were did according to the Illumina “16S Metagenomic Sequencing Library Preparation” protocol.

**2.6 Sequence Analysis**

Sequences analysis were performed by Uparse software (Uparse v7.0.1001) using all effective reads. Sequences with ≥ 97 % similarity were assigned to the same OTUs. Representative sequence for each OTU was screened for further annotation. For each representative sequence, Morthur software was performed against the SSUrRNA database of SILVA Database for species annotation at each taxonomic rank.

**Results**

**Participant Characteristics**
Within the period of study, we recruited ten patients with chronic rhinosinusitis with nasal polyps (CRSwNP). We examined the pathological histology of the nasal polyps and investigated microbiome of the uncinate process. The age characteristic and gender distribution shown in Table 1

Table 1. Patient characteristics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (20)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 28 years</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>29 - 39 years</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>40-50 years</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>&gt;50 years</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>60</td>
</tr>
</tbody>
</table>

Histopathological Result

The histopathology examination results revealed that most of histological characteristics were neutrophilic (noneosinophilic types) were found in 7 samples (70%) and eosinophilic types in 3 samples (30%) shown in table 2 while age and histopathological result distribution shown in table 3.

Table 2. Histopathological Characteristics

<table>
<thead>
<tr>
<th>Histopathological Result</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrophilic Types</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>Eosinophilic Types</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3. Age and Histopatological Distribution Result

<table>
<thead>
<tr>
<th>Sample</th>
<th>Age</th>
<th>Histopathological Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>47 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P2</td>
<td>54 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P3</td>
<td>39 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P4</td>
<td>18 years</td>
<td>Eosinophilic Types</td>
</tr>
<tr>
<td>P5</td>
<td>59 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P6</td>
<td>21 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P7</td>
<td>18 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P8</td>
<td>35 years</td>
<td>Neutrophilic Types</td>
</tr>
<tr>
<td>P9</td>
<td>32 years</td>
<td>Eosinophilic Types</td>
</tr>
<tr>
<td>P10</td>
<td>62 years</td>
<td>Eosinophilic Types</td>
</tr>
</tbody>
</table>

Sequencing Result

Single-ends reads was assigned to samples based on their unique barcode. Quality filtering on the raw reads were performed under specific filtering conditions to obtain the high-quality cleans reads. A total of 900,783 raw sequences passed quality filtering steps and after chimera removal, we obtained 753,805 reads, which had passed all quality filters under 97% identify conditions.

Microbial Identification

The microbial communities in the sinuses of chronic rhinosinusitis with nasal polyps subjects were represented in the Phyla *Proteobacteria* (54.86%), *Firmicutes* (21.06%), *Cyanobacteria* (12.51%), *Fusobacteria* (4.15%), *Actinobacteria* (4.05%), and *Bacteroidetes* (3.37%) shown in Figure 1, table 3 and table 4.
### Table 3. Microbial Composition Distribution of CRSwNP

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Class</th>
<th>Ordo</th>
<th>Family</th>
<th>Genus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actinobacteria</td>
<td>Unidentified_</td>
<td>Propiobacteriales</td>
<td>Propionibacteriaceae</td>
<td>Propionibacterium (4.05%)</td>
</tr>
<tr>
<td>(4.05%)</td>
<td>Actinobacteria (4.05%)</td>
<td>(4.05%)</td>
<td>(4.05%)</td>
<td></td>
</tr>
<tr>
<td>Bacteroidetes</td>
<td>Bacteroidia (3.37%)</td>
<td>Bacteroidales (3.37%)</td>
<td>Prevotellaceae (3.37%)</td>
<td>Prevotella (2,06%)</td>
</tr>
<tr>
<td>(3.37%)</td>
<td></td>
<td></td>
<td></td>
<td>Prevotella_9 (1,31%)</td>
</tr>
<tr>
<td>Cyanobacteria</td>
<td>Chloroplast (12.51%)</td>
<td>Unidentified</td>
<td>Unidentified</td>
<td>Unidentified</td>
</tr>
<tr>
<td>(12.51%)</td>
<td></td>
<td>Chloroplast (12.51%)</td>
<td>Chloroplast (12.51%)</td>
<td>Chloroplast (12.51%)</td>
</tr>
<tr>
<td>Firmicutes</td>
<td>Bacilli (15.25%)</td>
<td>Bacillales (15.25%)</td>
<td>Bacillaceae (15.25%)</td>
<td>Bacillus (15.25%)</td>
</tr>
<tr>
<td>(21.06%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clostridia (5.81%)</td>
<td>Clostridiales (5.81%)</td>
<td>Family_XI (1,36%)</td>
<td>Finegoldia (1,36%)</td>
</tr>
<tr>
<td>Fusobacteria</td>
<td>Fusobactera (4.15%)</td>
<td>Fusobacteriales (4.15%)</td>
<td>Fusobacteriaceae (4.15%)</td>
<td>Fusobacterium (4.15%)</td>
</tr>
<tr>
<td>(4.15%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proteobacteria</td>
<td>Alphaproteobacteria</td>
<td>Sphingomonadales (51.10%)</td>
<td>Sphingomonadaceae (51.10%)</td>
<td>Sphingomonas (51.10%)</td>
</tr>
<tr>
<td>(54.86%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deltaproteobacteria</td>
<td>Desulfovibionales (3.76%)</td>
<td>Desulfovibronaceae (3.76%)</td>
<td>Desulfovibrio (3.76%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4. Microbial Composition Distribution of each CRSwNP samples

<table>
<thead>
<tr>
<th>Sample</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
<th>P6</th>
<th>P7</th>
<th>P8</th>
<th>P9</th>
<th>P10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proteobacteria</td>
<td>46.75</td>
<td>95.93</td>
<td>17.98</td>
<td>62.31</td>
<td>57.71</td>
<td>21.92</td>
<td>20.62</td>
<td>38.99</td>
<td>21.85</td>
<td>8.58</td>
</tr>
<tr>
<td>Firmicutes</td>
<td>5.15</td>
<td>0.79</td>
<td>62.33</td>
<td>11.54</td>
<td>6.35</td>
<td>37.36</td>
<td>24.04</td>
<td>31.96</td>
<td>7.63</td>
<td>38.01</td>
</tr>
<tr>
<td>Cyanobacteria</td>
<td>32.63</td>
<td>0.59</td>
<td>17.78</td>
<td>1.69</td>
<td>1.81</td>
<td>33.69</td>
<td>18.62</td>
<td>3.52</td>
<td>34.00</td>
<td>4.29</td>
</tr>
<tr>
<td>Fusobacteria</td>
<td>7.60</td>
<td>1.40</td>
<td>1.10</td>
<td>7.85</td>
<td>17.70</td>
<td>1.94</td>
<td>4.75</td>
<td>4.28</td>
<td>6.77</td>
<td>19.37</td>
</tr>
<tr>
<td>Actinobacteria</td>
<td>3.08</td>
<td>0.56</td>
<td>0.11</td>
<td>9.23</td>
<td>8.74</td>
<td>0.2</td>
<td>27.67</td>
<td>9.63</td>
<td>17.56</td>
<td>20.48</td>
</tr>
<tr>
<td>Bacteroidetes</td>
<td>4.79</td>
<td>0.74</td>
<td>0.72</td>
<td>7.38</td>
<td>7.69</td>
<td>4.88</td>
<td>4.30</td>
<td>11.62</td>
<td>12.19</td>
<td>9.26</td>
</tr>
</tbody>
</table>

*In percentage*

### Table 5. Age, Histopathological and Predominant phyla Distribution of each CRSwNP samples

<table>
<thead>
<tr>
<th>Sample</th>
<th>Age</th>
<th>Histopathological Result</th>
<th>Predominant Phyla</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>47 years</td>
<td>Neutrophilic Types</td>
<td>Proteobacteria</td>
</tr>
<tr>
<td>P2</td>
<td>54 years</td>
<td>Neutrophilic Types</td>
<td>Proteobacteria</td>
</tr>
<tr>
<td>P3</td>
<td>39 years</td>
<td>Neutrophilic Types</td>
<td>Firmicutes</td>
</tr>
<tr>
<td>P4</td>
<td>18 years</td>
<td>Eosinophilic Types</td>
<td>Proteobacteria</td>
</tr>
<tr>
<td>P5</td>
<td>59 years</td>
<td>Neutrophilic Types</td>
<td>Proteobacteria</td>
</tr>
</tbody>
</table>
Cont.. Table 5. Age, Histopathological and Predominant phyla Distribution of each CRSwNP samples

<table>
<thead>
<tr>
<th>No</th>
<th>Age</th>
<th>Histopathological Type</th>
<th>Predominant phyla</th>
</tr>
</thead>
<tbody>
<tr>
<td>P6</td>
<td>21 years</td>
<td>Neutrophilic Types</td>
<td>Firmicutes</td>
</tr>
<tr>
<td>P7</td>
<td>18 years</td>
<td>Neutrophilic Types</td>
<td>Actinobacteria</td>
</tr>
<tr>
<td>P8</td>
<td>35 years</td>
<td>Neutrophilic Types</td>
<td>Proteobacteria</td>
</tr>
<tr>
<td>P9</td>
<td>32 years</td>
<td>Eosinophilic Types</td>
<td>Cyanobacteria</td>
</tr>
<tr>
<td>P10</td>
<td>62 years</td>
<td>Eosinophilic Types</td>
<td>Firmicutes</td>
</tr>
</tbody>
</table>

Discussion

This study investigated the bacterial microbiome of chronic rhinosinusitis with nasal polyps patients and histopathological examination of nasal polyps.

In this current study, samples was varied from 18 years old to 62 years old. The prevalence of CRSwNP was higher in female (60%) than male (40%). There are variety conditions related to chronic nasal inflammation due to nasal polyps. The age at which nasal polyps be found is variable and not link to any precipitating factors.

The histopathological examination reported dominated by the neutrophilic type (noneosinophilic) (70%). Previous studies founds nasal polyps tissue excised from CRSwNP during surgery in Asian countries, have dominant non eosinophilic type while in western countries tend to have eosinophilic type, the Asians population have a lower incidens of atopy which correlated with eosinophilic polyps. Environmental and genetical factors might influence the histopathological results and considered that may modify the microbial composition.

The predominant phyla in this study are Actinobacteria, Bacteroidetes, Cyanobacteria, Firmicutes, Fusobacteria, and Proteobacteria, with the most abundance is Proteobacteria (54.86%). From ten samples patient that we recruited, 50% had Proteobacteria as a predominant phyla, 4 samples with Neutrophilic type and 1 sample with eosinophilic type of histopathological examination result. Three samples had Firmicutes as a predominant phyla 2 samples with Neutrophilic type and 1 sample with eosinophilic type of histopathological examination result. Three samples had Actinobacteria as predominant phyla with Neutrophilic type and one sample had Cyanobacteria with eosinophilic type.

The research about microbiome of lower respiratory tract still in early start. Some of reports indicate a precense of Proteobacteria in asthmatic patients. Ramakrishnan et al, 2015 found abundance of this phyla was similar among asthmatic and non asthmatic patients with CRS. The study about genera within Proteobacteria phyla found alteration in several genera of moderate abundance. Proteobacteria might contribute to the pathogenesis of CRSwNP disease via eicosanoids and related mediators.

Previous study revealed, the bearing of nasal polyps wasn’t affiliated with alterations in the nasal microbiome. Among patients on CRS, allergic rhinitis was associated with diminished Actinobacteria levels at the phylum level. The Actinobacteria was consist in the healthy nasal microbiota and believed as key species and potentially beneficial microbe that maintain the healthy state of sinonasal environment, previous study has been revealed that it produce bacteriocins which have antibacterial and antifungal activity that may protected against pathogens.

Our study agreed that microbiome alteration seems to happens in this research. The potential microbe that proved maintaining the sinonasal healthy environment was less dominated in this study. It still unclear, and still remains further study whether pathophysiology of CRSwNP had correlation with this altering condition of microbiome or had another myriad factor that contribute to this condition, since the immunological factor remains more dominating inflammation condition of CRSwNP.

Conclusion

Our study showed microbiome alteration and its possibly correlation with histopathological examination. Alteration composition of microbiome in sinonasal cavity might have role in chronic inflammation leading to disease state. Further investigation involved larger participants, include the history of asthmatic and atopy of the participants, and its correlation with proinflammatory cytokins patterns.
Conflicts of Interest: The authors have no conflicts of interest to declare.

Acknowledgment: The authors very gratefully thank all chronic rhinosinusitis patients who were willing to be a respondent in this study.

Source of Funding: Self.

References

Cadre Behavior as Social Capital for the Development of TB Care Community in the Management of Tuberculosis in Medan City

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Abstract

It is estimated that around one third of the world’s population has been infected by Mycobacterium tuberculosis, about 95% of TB case and 98% of death from TB in the world occur in various developing countries. The Incidence Rate (IR) of TB in North Sumatera Province is 501/100,000. Moreover, the Prevalence of TB in Medan has been increasing for three consecutive years. In Strategy 5 of TB Prevention Strategy Plan, it is acclaimed the importance of the community’s role in promoting, case discovering, and TB treatment support, as well as community empowerment through TB integration in family and community-based health effort. To achieve it, the role of cadre as social capital is very essential in developing TB Care community, through mentoring from TB Care community in Higher Education as a Health Department partnership in TB control. For this reason, a study is performed to discover the behavior of cadres after receiving training. The research method is Quasi-Experiment pre-test post-test group design. The population of the study is all health cadres in Helvetia sub-district of Helvetia Community Health Center and Sukaramai Village I of Medan Area Community Health Center of 15 cadres. The training is conducted at the Medan Area Community Health Center, the training methods are lecture, discussion, and role playing (simulation). The analysis or normally distributed data is performed through T test and for the abnormally distributed data, using the non-parametric statistics Wilcoxon signed Rank Test. The result shows that the majority respondents are above 40 years old, with high school diploma, and entrepreneurs, these characteristics will affect their activity as cadres. There is a significant relationship between knowledge before and after cadre training (p < 0.05). The mean value at the pre-test was 40.87 and after being given training, it increased to 50.67, thus the training methods of lecture, discussion, role playing can increase cadre knowledge in prevention, finding, and control of TB and TB RO. There is a significant relationship between attitudes before and after cadre training (p = 0.05). It can be concluded that cadres as potential social capital are used as the development of the TB Care community which will coordinate with the TB Care PT community, in order to improve case finding in the context of TOOS TB.

Keywords: cadre behavior, TB case finding, cadre empowerment, TB Care Community

Introduction

According to the WHO report in 2017, there were an estimated 1,020,000 cases in Indonesia. The 2013 prevalence survey and 2015 global TB report displayed that the IR TB in North Sumatara province was at 501 / 100,000¹ ². In the context of the challenge of overcoming TB elimination there are 6 (six) strategies developed by JEMM (2013). One essential strategy is Strategy 5, which is Increasing Community Independence in TB Control, which includes: involvement of community roles in promotion, case finding, and support for TB treatment and community empowerment through TB integration in family and community-based health efforts³. Health cadres are the members of the community, who can provide promotive services, preventive and curative services appropriate for the needs of local communities⁴. Health cadres are important social capital in the community both in rural and urban areas. Social
capital is a concept that is frequently used to describe social capacity to fulfill life needs and maintain social integration. The definition of social capital that has developed so far leads to the formation of three levels of social capital, namely on the level of values, institution, and mechanism.

Health cadres are the members of the community who can provide promotive services, preventive and curative services according to the needs of local communities. Health cadres provide great support to develop strong commitments and provide more creative solutions to improve CDR. Health cadres participate in the planning, implementation, monitoring, and evaluation of TB programs. Meanwhile, according to Awfeso (2008) the role of cadres in the community is: 1) Conducting counseling to the community; 2) Referring patients who suffer from cough for more than 2 weeks to receive sputum pot at the Posyandu; 3) Supervising the taking of medicine for pulmonary TB; 4) Spreading the awareness of completing the treatment; 5) Describing the efforts to prevent and transmit TB disease to the patients and the community; and 6) Recording and reporting. Furthermore, Holtgrave et al. (2004) reveal that highly educated cadres have the ability and experience as valuable human resources for an organization.

According to the problems above, health cadres are empowered as citizens who are able to motivate the community to discover TB cases, as well as reduce the risk of transmission to the community through the development of the TB Care community. The purpose of this study is to analyze the behavior of cadres in discovering Tuberculosis (TBC) cases, treatment until recovery, knowledge of MDR TB and prevention of transmission to the family. After receiving the training, they are expected to be social capital in the development of the TB Care Community in Medan City.

Materials and Method

The design of this study is Quasi Experiment pre-test post-test design. The population in this study are all health cadres in the work area of Medan Area Health Center and Medan Helvetia Community Health Service. As for the sample, one village is selected as an area with high urban MDR TB cases and one village is chosen with low MDR TB cases in Medan City. The result of the observation showed that Helvetia Village in the Medan Area Community Health Center working area represents as an area with low MDR TB cases, there are 15 cadres in these areas that become the sample and receive the training.

The training is held in the Medan Area Community Health Center Meeting Room on 30-31 October 2018. The materials and training modules provided are modified from the cadre training curriculum of the Indonesian Ministry of Health in 2018. Training materials included: 1) Introduction to TB; 2) Introduction of MDR TB; 3) Cadre Role in TB Control; 4) Case Finding of Active TB through Family / Community Approach; 5) Active Case Finding and Contact Investigation by TB Cadre; 6) Mentoring of TB Patients by Cadre; 7) The Tracking of Absent TB Patient. The training is conducted with lecture method, question and answer discussion, video playback, and role playing especially for Active Case Finding material and Contact Investigation.

The data collection is conducted with questionnaire before the training and at the end of the training to measure the changes in knowledge of attitudes and actions before and after the treatment. Data analysis for normally distributed data use T test, while for abnormally distributed data use the non-parametric statistics Wilcoxon signed Rank Test. The intervention action and questionnaire have received ethical clearance from the Faculty of Nursing No.1319 / III / SP / 2018 of 2018.

Result and Discussion

The Knowledge, Attitudes, and Action of Cadres After Receiving Training as Social Capital for the Development of TB Care Community

The cadre training as respondents has been carried out as the forerunner to the establishment of a village that concern with TB Care which is expected to empower the community in the prevention, finding, and control of TB Care. The following will be describing the characteristics of respondents including: age, education, occupation. As can be seen in the following description.
### Table 1. Proportion Distribution of Characteristic of Cadres as Social Capital for the Development of TB Care Community in Medan City in 2018

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 40 years</td>
<td>7</td>
<td>46.7</td>
</tr>
<tr>
<td>&gt; 40 years</td>
<td>8</td>
<td>53.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle School Graduates</td>
<td>4</td>
<td>26.7</td>
</tr>
<tr>
<td>High School Graduates</td>
<td>10</td>
<td>66.7</td>
</tr>
<tr>
<td>University Graduates</td>
<td>1</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>6</td>
<td>40.0</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>9</td>
<td>60.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The majority of respondents are above 40 years (53.3%), and the remaining is ≤ 40 years. At this age, cadres are expected to be able to work actively outside, such as in Posyandu and in the community because they no longer have to cater to their children. Furthermore, if associated with the occupation of the cadres who are unemployed and are entrepreneurs, their time can indeed be used to help the community. The result of the study is similar to the result by Chatarina Umbul and Kurnia which reveals that the highest number of cadres are at senior age and they are more active because they have more free time in the morning and to nourish citizens in their environment.

The majority of respondent are high school graduates, education is one of the bases in developing potential and social capital. This study is similar with a study conducted by Katerina Umul that shows that there are more cadres with high school diploma. Education contributes to a person’s behavior because through adequate education it is expected to have a broad thinking horizon so that they are able to quickly receive health information that ultimately can provide the basic capital for behavior change.

### Table 2. The Influence of Cadre Training as Social Capital for the Development of TB Care Community in Knowledge, Prevention, and Finding of TB Cases in Medan City in 2018

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Median (Min – Max)</th>
<th>SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>15</td>
<td>40.87</td>
<td>42.00 (28 – 64)</td>
<td>10.914</td>
<td>0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>15</td>
<td>50.67</td>
<td>50.00 (33 – 72)</td>
<td>11.757</td>
<td></td>
</tr>
</tbody>
</table>

In accordance with Table 2, it is known that there is a significant influence between knowledge before and after cadre training (p < 0.05). The mean value at pre-test was 40.87 and after the training it increased to 50.67, it indicates training with lecture method, discussion, and role playing could improve cadre’s knowledge for the development of TB Care Community in the prevention and finding of TB and MDR TB.

After being given training, there are 13 people who answered questions about the role of cadres in 6 activities. This result is consistent with a research conducted by Pratiwi, Betty, Hargono, Widya (2012), which states there is an upgrade in knowledge of 12.5% before and after tuberculosis training. Training with the lecture method effectively increases the knowledge and attitudes of health cadres about tuberculosis. Moreover, a study conducted by Chatarina and Kurnia also demonstrates that after training the cadres, there is a significant difference between knowledge about TB at pre-test compared with post-test (p value < 0.05). Furthermore, a study conducted by Ni Putu Sumartini about strengthening the role of health cadres in the finding of tuberculosis cases through education with the Theory of Planned Behavior approach can increase cadre knowledge. In addition, a study by Azizah on the training to improve the ability of health cadres in handling tubercularosis (TBC) in the work area of Sragen II Community Health Center also displays that there is an 80% increment in knowledge after receiving the training. Followed by a study by Ni Putu Eva Yanti about Controlling Tuberculosis Cases Through TB Care Cadres Group also exhibits that there is an increase in knowledge of TB Care Cadre Group (Kelompok Kader Peduli TB/KKP-TB) in controlling TB after receiving training.
Table 3. The Influence of Cadre Training as Social Capital for the Development of TB Care Community On Attitudes About Prevention, Controlling, and Finding of TB Cases in Medan City in 2018

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Median (Min – Max)</th>
<th>SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>15</td>
<td>124.00</td>
<td>123.00 (79 – 157)</td>
<td>17.263</td>
<td>0.005</td>
</tr>
<tr>
<td>Post Test</td>
<td>15</td>
<td>133.13</td>
<td>132.00 (105 – 154)</td>
<td>13.092</td>
<td></td>
</tr>
</tbody>
</table>

Refer to Table 3, there is a significant influence between attitudes before and after cadre training (p = 0.05). Judging from the median value, there is an increase in cadre attitudes, before the value was 123.00 then it increased to 132.00 after receiving training. This is in line with a research conducted by Nur Fadilah et al. about the cadre behavior in the finding of TB suspects. Good attitude is generally related to internal behavior.

Through Monopoly Simulation Games, reveals that there are differences in attitudes of respondents regarding TB after good intervention and 1 week after intervention. Next, Ni Putu Eva Yanti on controlling tuberculosis cases through TB Care Cadre Group displays that there is an increase in attitude of the TB Care Cadre Group in controlling TB after receiving training.

Table 4. The Influence of Cadre Training as Social Capital for the Development of TB Care Community On Action Before and After Training in Medan City in 2018

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Median (Min – Max)</th>
<th>SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>15</td>
<td>23.20</td>
<td>30.00 (0 – 32)</td>
<td>11.252</td>
<td>0.001</td>
</tr>
<tr>
<td>Post Test</td>
<td>15</td>
<td>31.87</td>
<td>32.00 (30 – 32)</td>
<td>0.516</td>
<td></td>
</tr>
</tbody>
</table>

In accordance with table 4, with the Kruskal Wallis test it is known that there is a significant influence between the action before and after cadre training (p < 0.05). Based on the median value, there are changes, namely the median value after training is higher (32.00) than before the training (30.00).

Consistent with a research performed by Eko Wahyudi et al on the Relationship of Cadre Knowledge, Attitudes, and Motivation with the Discovery of Suspected Pulmonary Tuberculosis in Sanankulon Community Health Center, there is a positive and significant relationship between cadre knowledge, attitudes, and motivation with the discovery of suspected pulmonary TB at Sanankulon Community Health Center (p-value = 0.00 and R2 = 0.691). Moreover, similar to a study by I Made Kusuma Wijaya et al (2014), there is a significant relationship between knowledge, attitudes, and motivation with health cadre activities; Health cadres with high knowledge are more than 18 times more likely to be active than cadres with low knowledge; Health cadres with good attitudes are 8 times more likely to be active than cadres with less attitudes; Highly motivated health cadres are 15 times more likely to be active than cadres with low motivation.

Conclusion and Suggestion

Conclusion

The majority age of the respondents is above 40 years, are mostly high school graduates, and the majority of them work as entrepreneurs. These characteristics will affect their activity as cadres.

There is a significant influence between knowledge before and after cadre training (p <0.05). The mean value at pre-test was 40.87 and after being given training it increased to 50.67, thus training with lecture method,
discussion, and role playing can increase the cadre knowledge in prevention, finding, and control of TB and MDR TB.

There is a significant influence between attitudes before and after cadre training (p = 0.05). Judging from the median, there is an increase in cadre attitudes, before the value was 123.00 then it increased to 132.00 after receiving training.

**Ethical Clearance**: Research has obtained approval from Universitas Sumatera Utara

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**References**


The Effect of Video on the Change of Attitude Toward Stunting Prevention among Children in State Senior High School 1 Topoyo, Central Mamuju

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1Department of Community Nutrition, Mulawarman University, 2Department of Health Policy Administration, Hasanuddin University, 3Department of Community Nutrition, Hasanuddin University, 4Department of Health Policy Administration, Hasanuddin University

Abstract

The reduction of infants stunting is still very limited to pregnant women and Baduta or Children under two years old. Form of education provided to society need to be more persuasive in order to increase action to solve practical problems and improve their health. This study aimed to examine the effect of video compared to video plus explanation on students’ attitude in order to prevent stunting in the State Senior High School 1 Topoyo, Central Mamuju. This research was conducted on January 7th, 2018 until January 7th, 2019 in Topoyo, Central Mamuju Regency, West Sulawesi Province. The population of this study were all male and female students at State Senior High School 1 Topoyo totaled 710. Control sample was decided by using a ratio of 1:1, so that the total of sample are 342 students (171 + 171). The results showed that there was attitude change before and after intervention by watching video and video plus material explanation from instructor about first 1000 days of life (1000 Hari Pertama Kehidupan / HPK) and stunting prevention among children under five years old, which means that the video had an influence (p = 0.000); there was no change found in the control group after intervention (p = 0.713). Furthermore, there was difference between the use of video and the use of video accompanied by explanation (p= 0.000). It is suggested that efforts targeting public attitude change toward stunting prevention should be done earlier, ranging from primary to secondary education. Socialization about stunting prevention need to arrange systematically by government, so that the negative impact of malnutrition will be minimized.

Keywords: Attitude, Stunting, HPK.

Introduction

Based on data from Global Nutrition Report, Indonesia is ranked 15th of back sequence1-3. Hence, Indonesia is considered as the 15th worst stunting case in the world after Madagascar2-4. The worst stunting rank in the world are Timor Leste (57.7 %), Madagascar (49.2 %), Guatemala (48.0 %), Pakistan (45.0 %), Lao People’s Democratic (43.8 %), Republic Mozambique (43.1 %), Nigeria 43.0%, Malawi (42.4 %), the Central African Republic (40.7 %), Ethiopia (40.4), Chad (38.7 %), India (38.7 %), Mali (38.5 %) and Indonesia which is ranked fifteen in the world stands at 36.4 %)1-3.

One third of children in the world who are stunted are in India, and children in rural areas are worst affected5-7. The determinants of stunting among indigenous children in Jharkhand and Odisha Village, India, require intervention and treatment8,9. World Health Organization (WHO) reported that a total of 49.2% of children were chronically malnourished in Madagascar6,10, placing the country suffered the highest prevalence of stunting in the world6, 11. Short children as a result of chronic malnutrition will cause short term and long term adverse consequences if not addressed at an early age5. Short-term risks are susceptible to various infectious diseases such as diarrhea and pneumonia due to a weakened immune system12.

The results of basic health research in West Sulawesi found that the proportion of the national short toddler occurred between 2007 and 2013. This proportion is 19.2 percent of short and 18 percent of very short. Total
stunting of 37.2 percent\(^{(13)}\). West Sulawesi ranked top
5 and stood at a very short category at 22.3 percent,
while short category was 25.7 percent. Toddlers with
nothing short category stood at 52.0 percent. This means
that there are approximately 48.0 percent of children
under five in West Sulawesi who suffered stunting. The
average percentage is much higher than the national
average which the difference in numbers is about 10.2
percent compared to 37.2 percent of national stunting\(^{(13)}\).
As is known, stunted children are not able to reach their
developmental potential, they have weak cognitive
performance and low educational achievement than
those with good nutrition. Children who are chronically
undernourished experience the highest prevalence of
stunting. Stunting due to chronic malnutrition will cause
a short child if not addressed at young age\(^6\). Various
infectious diseases such as diarrhea and pneumonia will
be exist because of weakened immune system\(^{6,11}\).

Learning media as a part of messenger technology
is a tool that can be used for learning purposes. On this
occasion, a research on learning media effectiveness,
especially video, is proposed. This research aims to
find out the impact of video on the change of students’
attitude for stunting prevention among children under
five years old in State Senior High School 1 Topoyo.

**Materials and Method**

The research design uses “Quasi-Experiment”,
namely pre-test and post-test with control group design.

The research was conducted on January 7\(^{th}\), 2018
until January 8\(^{th}\), 2019. The experiment was located in
State Senior High School 1 Topoyo, Central Mamuju
Regency, West Sulawesi Province.

The population of this study were all male and
female students at the schools amounted to 710 people.
By using proportional random sampling, the total of 171
students were included in the experimental group and
171 students were included in control group. Therefore
the total of sample are 342 respondents.

**Results and Discussion**

**Research Results**

Characteristics of respondents include the following:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>53</td>
<td>31,0</td>
</tr>
<tr>
<td>Woman</td>
<td>118</td>
<td>69,0</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Age (Year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 Years Old</td>
<td>12</td>
<td>7,0</td>
</tr>
<tr>
<td>17 Years Old</td>
<td>113</td>
<td>66,1</td>
</tr>
<tr>
<td>18 Years Old</td>
<td>46</td>
<td>26,9</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Level Education of Parent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>89</td>
<td>52,0</td>
</tr>
<tr>
<td>Junior High School</td>
<td>36</td>
<td>21,1</td>
</tr>
<tr>
<td>Senior High School</td>
<td>34</td>
<td>19,9</td>
</tr>
<tr>
<td>PT/University</td>
<td>12</td>
<td>7,0</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Parent Job/Profession</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>125</td>
<td>73,1</td>
</tr>
<tr>
<td>Civil Servant</td>
<td>9</td>
<td>5,3</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>37</td>
<td>21,6</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
</tbody>
</table>
The table above shows that the number of respondents aged 17 years are more than other respondents as many as 113 respondents (66.1%). Female respondents are many more than male respondents as many as 118 respondents (69.0%). Mostly level of parent’s education is primary school as many as 89 respondents (52.0%). Mostly respondents’ parents work as farmer, as many as 125 respondents (73.1%).

The experiment process was conducted by instructional video playback with presenting HPK material. This material lead learners to understand the ways of stunting prevention in children under five. The treatment was given to students in experimental group. The effectiveness of the treatment was seen by measuring the change of students’ attitude from pretest to post-test. Meanwhile, for more objectivity, measurements were also carried out in the control group at Vocational High School 1 Topoyo. There are no intervention in the control group.

This study also included control group to compare attitudes of students toward 1000 HPK material and prevention of stunting among children under five which was not given intervention / treatment. Uptake ability of students toward other information sources may give influences. Therefore, the control group was selected from same area and same level of knowledge to control certain aspects. Vocational High School 1 Topoyo which is located in same district was selected as group control. Pretest and post-test were also conducted in the control without any intervention or treatments.

Attitude of Students Toward Material about Stunting Prevention

Attitude is the value preference that are individually owned by students. The attitude is a form of approval or rejection depending on the values and norms inherent in the students during their development. The improved attitudes of students in learning before and after intervention can be seen in the following table:

Table 2. Students’ Attitude Before and After Intervention (Intervention Group/SMAN 1 Topoyo and Control Group SMK Topoyo) In Central Mamuju Regency, West Sulawesi, 2018

<table>
<thead>
<tr>
<th>Group</th>
<th>Attitude</th>
<th>Measurement Results</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pretest</td>
<td>Post Test</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Intervention</td>
<td>Well</td>
<td>131</td>
<td>76,6</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>40</td>
<td>23,4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
<tr>
<td>Control</td>
<td>Well</td>
<td>111</td>
<td>64,9</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>60</td>
<td>35,1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100</td>
</tr>
</tbody>
</table>

The table above showed that in the Intervention Group, Pretest measurement results with Well category was 131 (76.6%) and Less category was 40 (23.4%); and the measurement results of Post Test were 149 (87.1%) for Well Category and 22 (12.9%) for Less Category. The value of p = 0.000 means that there was effect of the intervention on the attitude change respondents in the prevention of stunting in State Senior High School 1 Topoyo. Meanwhile, the Pretest measurement results of Control Group were 128 (74.9%) for Well Category and 43 (25.1%) for Less Category.

Furthermore, the researchers compared the effect of video (without explanation) and video plus explanation on attitude change. The difference of attitude by using the two different video categories can be seen in the following table:
Table 3. Attitude Difference between Intervention Using Video and intervention using Video Plus Explanation in State Senior High School 1 Topoyo, Central Mamuju Regency, West Sulawesi Province, 2018

<table>
<thead>
<tr>
<th>Category</th>
<th>Knowledge</th>
<th>Measurement Results</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Video</td>
<td>Well</td>
<td>87</td>
<td>50,9</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>84</td>
<td>49,1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100,0</td>
</tr>
<tr>
<td>Video Plus</td>
<td>Well</td>
<td>131</td>
<td>76,6</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>40</td>
<td>23,4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171</td>
<td>100,0</td>
</tr>
</tbody>
</table>

The analysis result of attitude difference after watching the video and video plus is $p = 0.000$, which means there is difference in the attitude after watching the two video category. In another word, video presentation accompanied by explanation is more effective in changing students’ attitude for stunting prevention in State Senior High School 1 Topoyo, Central Mamuju Regency, West Sulawesi.

**Discussion**

The measurement result that there was difference result of pretest and post test proved that there was effect of video on attitude change among students in treatment group. Meanwhile, there was no video influence in the control group that showed that there was no significant result from pretest to post test. This is probably because of the formation of attitude which is influenced by many variables, such as trust, credibility, culture, ideology, and so on. In addition to those factors, attitude formation is also influenced by psychological factors, sociological factors and physiological factors. Psychological factors can be recognized when your attitude is affected by your feeling or mood (sad, happy, angry, so on). The sociological factor includes certain social values giving stereotype on person as well as concept or particular aspect of culture gives impact on person attitude. Physiological factors also affect attitude when person is in a state of fatigue or physical unstable.

Students’ attitude may probably predicts whether students show a particular behavior or not. However, it does not mean that if person has positive attitude on learning then he or she will learn well or get good results. Attitude is relatively sedentary mental tendency to react in particular condition.

Video plays that illustrate the risk of children who are malnourished are expected to lead students to the understanding of these events which finally can direct them to a desired direction. The influence of others are considered which we tend to be the same as the main assume for ourselves. This trend arises because of the urge to join in and avoid troubles. This matter causes video plays need to be accompanied by explanation by teachers or instructors who understand about the material broadcast. When comparing both methods of learning using video only and video plus, there was a difference, which video plus is more effective in changing students’ attitude.

Attitude requires in-depth study before it becomes a form of decision. Attitude is manifested in the form approval or rejection on something or someone. Personal attitude can be ambiguous or unambiguous because of some factors. Dishonesty or variability of a person may probably cause the difficulty of making decision. In certain social condition, people sometimes have a different attitude. People sometimes have to declare similarity with other people in order to overcome fear of alienation, isolation or afraid of being hated, and other specific social reasons from social environment. Someone who has different attitude from common people or majority may feel afraid of being extremely different.
The treatment made differently did not make a difference. It is clear that the process of attitude change is a complicated and long process. It is not easy to change attitude because it was born from a personal faith. Faith is the individual human right to express their existence. Attitude is affected by personal values that prevailed at the time. Adolescent has the value reference that comes from peers. It is not really surprising that teenagers are often in conflict with their parents because they want to show their existence. Therefore, to change their attitude quickly to be more positive, students or teenagers should be included in a participatory discussion as a part of learning method. Students are encouraged to initiate and identify their own problems and solutions. Learning should be sourced from the students, not from teachers.

Attitude will be easily formed if the emotional factors involved in personal experience. This personal experience is intertwined in someone’s life and it is need to be raised. The experience will help in forming the understanding toward social stimuli. When the students watch the video, they will require a response on what they have watched. Involvement of teachers or instructors after watching the video will provide reassurance on the material and confirmation on students’ attitude. The influence of someone who is supposed to be important for students or has an authority is more stronger on students’ attitude toward a thing. People who are usually considered as important figure for individuals are the elderly, people with higher social status, peers and close friends, teachers and spouses. Setting the video also requires careful planning by linking the matter with the traditions and culture. For example, mostly Japanese people are relatively short before the Second World War, but there was a change in posture after the revolution of nutrition in Japan.

**Conclusion**

Changes in attitude measured by pretest and post test after intervention by watching videos and video plus showed that there was video effect on students’ attitude (the measurement result p = 0.000). The finding was supported by result that there was no attitude change in the control group that was not given by video intervention (the measurement result p = 0.713). Besides, there is a difference between using video only and using video plus explanation as a medium of learning (the measurement result p = 0.000). Based on the research results, it is suggested that public awareness and attitude related to stunting prevention need to be addressed early, ranging from primary to secondary education. The dissemination and socialization of stunting prevention should be managed systematically by the government in collaboration with many parties including education sector to minimize the negative effect of malnutrition.

**Sources of Funding:** This research was funded by the researchers themselves. In other words, the source of funds is independent funds

**Ethical Clearance:** This research took recommendation for ethical approval from university with reference number: 4718/UN4.14.8/TP.02.02/2019.

**Conflict of Interest:** Nil

**References**


Relationship of Individual Attributes with Birth Place: Cross Sectional Study in Muna, East Indonesia

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Abstract

Background: Until now maternal mortality is very high. More than 20 million women worldwide are pregnant each year, 15% of whom experience complications that require attention from trained health workers to prevent morbidity and death. Labor at home nationally in Indonesia is also still high. The aim of the study was to determine the relationship of the attributes of individuals to the place of birth in Muna East Indonesia Method: The study design used a cross-sectional study, starting September 2016 until February 2017. Samples were 730 mothers of babies, spread across 22 regional health centers in Muna Regency. Sampling is proportional to simple random sampling.

Results: Most respondents preferred to give birth at home to 473 people (64.8%). Individual attributes that were significantly associated with the place of delivery were education OR = 2.69, Maternal occupation OR = 1.75, Parity OR = 0.46. Antenatal care (ANC) visit OR = 1.46. Maternal age and history of complications did not show a significant relationship with the place of delivery. Knowledge of mothers had a significant relationship with the place of delivery OR = 2.53. Further analysis with multivariate, significant related variables were education (Adjusted Odds Ratio (AOR): 2.69 [1.66-4.36]), Parity (AOR: 0.47 [0.34-0.66]), and Knowledge (AOR: 2.19 [1.57-3.06]).

Conclusion: Mother’s education and work, parity, ANC frequency and mother’s knowledge have a significant relationship with the choice of place of birth while the age variable and history of complications are not related.

Keywords: Individual Attributes, place of birth, Indonesia

Introduction

Until now maternal mortality is very high. An estimated 830 women die from complications of pregnancy or childbirth every day throughout the world. 99% of all maternal deaths occur in developing countries. Almost all of these deaths are related to low resources, and most can be prevented1. During the 2012-2017 period, almost 80 percent of live births worldwide occurred with the help of skilled health workers, up from 62 percent in 2000-20052. More than 20 million women worldwide are pregnant each year, 15% of whom may experience complications that require attention from trained health workers to prevent morbidity and death3. One of the factors of maternal and newborn death is labor at home4. The labor process is faced with a critical condition for the problem of emergency labor, so it is expected that labor is carried out in a health facility5,6.

In Indonesia too, according to the 2010 population census the main causes of maternal death are bleeding, hypertension in pregnancy, infection, prolonged labor and abortion7. Currently the maternal health status in Indonesia is still far from expectations, marked by the high mortality rate, which in 2015 still shows 305 / 100,000 KH, while the MDGs target 102 / 100,000 KH8 even the 2019 medium-term development plan, Indonesia targets 306 per 100,000 KH9. Hard work must be done to achieve the targets set for sustainable health development (SDGs),...
which is less than 70 per 100,000 KH in 2030\textsuperscript{10}.

The form of concern of the Republic of Indonesia government towards the community was also seen in the era of 1998, when the monetary crisis occurred by providing a special budget for services to disadvantaged people, including mothers giving birth for free through the health safety social network program called JPS-BK. A similar thing in 2004 was the establishment of Poor Health Insurance (Askeskin). In 2008, the Askeskin program was expanded to include the near poor as part of the new Jamkesmas program including incentives for health workers in antenatal care (ANC), childbirth and post-natal care (PNC) and now managed by an institution namely the Health Insurance Agency (BPJS) which is intended not only for the poor but for all Indonesian people. Childbirth claims by the puskesmas for maternity on condition that they give birth in health care facilities\textsuperscript{9}.

Since 2010 the government of the Republic of Indonesia has also declared an active standby village program, in which husbands, families and communities are expected to be active in order to better recognize danger signs and complications of pregnancy and increase births by trained personnel in health facilities\textsuperscript{13}. Until 2013, there were only 70.4 percent of deliveries at health facilities and only 29.6 percent at home / other. Likewise in Southeast Sulawesi it is still far from national coverage, where deliveries at health facilities are only 23.8% and generally at home which is 67.2%. Muna regency, which is the location of the study, has only 39.72% of the coverage in health facilities, the lowest in Southeast Sulawesi\textsuperscript{14}.

Individual attributes in the form of age, education, and occupation of the mother, parity, history of ANC, history of complications and knowledge of the mother are very important in determining the decision of the mother to choose the place of delivery\textsuperscript{15}. Several studies on maternal decisions regarding the place of labor have been carried out in Asian and African countries, but researchers want to see different things in the Indonesian region, especially the eastern part. The purpose of the study is to know the relationship of individual attributes (age, education and maternal occupation, parity, ANC frequency, history of complications and knowledge of mothers with decisions about places of delivery in Muna Regency

**METHOD**

The study design used a cross-sectional study, starting in September 2016 until February 2017. The sample was a total of 730 mothers of babies from 2,222 populations spread across 22 regional health centers in Muna Regency. Sampling is proportional to simple random sampling. Data analysis consisted of univariate, bivariate by classifying variables into two age categories; (at risk; 20 years and\textgreater; 35 years and not at risk; 20-35 years), education (low; elementary or non-school and high; minimum junior high school or higher) mother’s work (not working; not just working or housewife and work; have a job), parity (primipara; child 1 person and multipara; child\textgreater; 1 person) frequency of ANC (less; never or <4 times and sufficient; 4 times or more), history of complications (ever and never), maternal knowledge (less; <median and good score; ian median) and further analysis with multivariate.

**Research Results**

**Characteristics of Respondents**

The number of participants at the end of the study was 730 mothers who had children aged 0-1 years. The description of the research results can be seen in the following table
<table>
<thead>
<tr>
<th>Variables</th>
<th>Delivery in home (%)</th>
<th>Delivery in health facility (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>place of delivery</td>
<td>473 (64.8)</td>
<td>257 (35.2)</td>
<td>730 (100)</td>
</tr>
<tr>
<td><strong>Age (year)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>51 (10.8)</td>
<td>28 (10.9)</td>
<td>79 (10.8)</td>
</tr>
<tr>
<td>20-35</td>
<td>361 (76.3)</td>
<td>197 (76.7)</td>
<td>558 (76.4)</td>
</tr>
<tr>
<td>&gt;35</td>
<td>61 (12.9)</td>
<td>32 (12.5)</td>
<td>93 (12.8)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>1 (0.2)</td>
<td>4 (1.6)</td>
<td>5 (0.6)</td>
</tr>
<tr>
<td>Not grad</td>
<td>24 (5.1)</td>
<td>2 (0.8)</td>
<td>26 (3.6)</td>
</tr>
<tr>
<td>Basic Sc</td>
<td>74 (15.6)</td>
<td>17 (6.6)</td>
<td>91 (12.5)</td>
</tr>
<tr>
<td>Junior High Sc</td>
<td>122 (25.8)</td>
<td>37 (14.4)</td>
<td>159 (21.8)</td>
</tr>
<tr>
<td>Senior High Sc</td>
<td>180 (38.1)</td>
<td>115 (44.7)</td>
<td>295 (40.4)</td>
</tr>
<tr>
<td>Higher degree</td>
<td>72 (15.2)</td>
<td>82 (31.9)</td>
<td>154 (21.1)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td>395 (83.5)</td>
<td>191 (74.3)</td>
<td>586 (80.3)</td>
</tr>
<tr>
<td>Worker</td>
<td>2 (0.4)</td>
<td>0 (0)</td>
<td>2 (0.3)</td>
</tr>
<tr>
<td>Farmer</td>
<td>12 (2.5)</td>
<td>3 (1.2)</td>
<td>15 (2.0)</td>
</tr>
<tr>
<td>Vendor</td>
<td>12 (2.5)</td>
<td>6 (2.3)</td>
<td>18 (2.5)</td>
</tr>
<tr>
<td>Private</td>
<td>5 (1.1)</td>
<td>6 (2.3)</td>
<td>11 (1.5)</td>
</tr>
<tr>
<td>PNS/TNI/POLRI</td>
<td>16 (3.4)</td>
<td>17 (6.6)</td>
<td>33 (4.5)</td>
</tr>
<tr>
<td>Other, Honorer</td>
<td>31 (6.6)</td>
<td>34 (13.2)</td>
<td>65 (8.9)</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>125 (26.4)</td>
<td>113 (44)</td>
<td>238 (32.6)</td>
</tr>
<tr>
<td>2</td>
<td>128 (27.1)</td>
<td>70 (27.2)</td>
<td>198 (27.1)</td>
</tr>
<tr>
<td>3</td>
<td>112 (23.7)</td>
<td>34 (13.2)</td>
<td>146 (20.0)</td>
</tr>
<tr>
<td>4</td>
<td>50 (12.1)</td>
<td>26 (10.1)</td>
<td>83 (11.4)</td>
</tr>
<tr>
<td>5</td>
<td>37 (6.3)</td>
<td>10 (3.9)</td>
<td>40 (5.5)</td>
</tr>
<tr>
<td>6</td>
<td>12 (2.5)</td>
<td>3 (1.2)</td>
<td>15 (2.1)</td>
</tr>
<tr>
<td>7+</td>
<td>9 (1.9)</td>
<td>1 (0.4)</td>
<td>10 (1.3)</td>
</tr>
<tr>
<td><strong>Frekuensi ANC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>10 (2.1)</td>
<td>2 (8)</td>
<td>12 (1.6)</td>
</tr>
<tr>
<td>1 time</td>
<td>21 (4.4)</td>
<td>9 (3.5)</td>
<td>30 (4.1)</td>
</tr>
<tr>
<td>2 times</td>
<td>35 (7.4)</td>
<td>15 (5.8)</td>
<td>50 (6.9)</td>
</tr>
<tr>
<td>3 times</td>
<td>73 (15.4)</td>
<td>31 (12.1)</td>
<td>104 (14.2)</td>
</tr>
<tr>
<td>4 times or kore</td>
<td>334 (70.6)</td>
<td>200 (77.8)</td>
<td>534 (73.2)</td>
</tr>
<tr>
<td><strong>Complication history</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever</td>
<td>226 (47.8)</td>
<td>147 (57.2)</td>
<td>414 (56.7)</td>
</tr>
<tr>
<td>Never</td>
<td>274 (52.2)</td>
<td>110 (42.8)</td>
<td>316 (43.3)</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not good</td>
<td>267 (56.4)</td>
<td>87 (33.9)</td>
<td>354 (48.5)</td>
</tr>
<tr>
<td>Good</td>
<td>206 (43.6)</td>
<td>170 (66.1)</td>
<td>376 (51.5)</td>
</tr>
</tbody>
</table>
Table 1 shows that the majority of respondents preferred to give birth at home to 473 people (64.8%). Mothers are generally not at risk (20-35 years), which is 558 people (76.4%). Of the total who gave birth at home 473 people, more than half in the age range not at risk (20-35 years), which is 361 people (76.3%). Only a few <20 years old are 79 people (10.8%).

Based on the level of education, the largest proportion is high school (SMA) or equivalent, which is 295 people (40.4%) and the smallest is never attended by 5 people (0.6%). The work of respondents is generally only housewives, namely 586 people (80.3%) and the smallest is 2 workers (0.3%). Based on parity, generally the respondents have a number of living children as many as 1 person, namely 238 people (32.6%), the smallest are those who have parity of 7 or more people, 10 people (1.3%). Of the total who gave birth in health facilities, the majority of respondents had 1 parity of 113 people (44%). The number of ANC visits is generally 4 times or more as many as 534 people (73.2%). And even though it is the smallest, there are still 12 ANC visits (1.6%). Most of the respondents had experienced complications during pregnancy or childbirth, namely 414 people (56.7%) and of the total who gave birth in health facilities, in general had experienced complications, namely 147 people (57.2%).

Analysis of factors related to the place of delivery

To see the relationship of variables related to place of delivery (Table 2), bivariate and multivariate analyzes were performed. The results of bivariate analysis showed that age did not have a significant relationship with the place of birth (p> 0.05). Educational factors have a significant relationship with the place of delivery (p<0.05) OR = 2.69. This shows that mothers with low education more likely to give birth at home compared to those who have higher education. Maternal work also had a significant relationship with the place of delivery (p<0.05) OR = 1.75. This shows that mothers who do not work and only as housewives have a 1.75 chance of giving birth at home compared to working mothers. The parity factor also had a significant relationship with the place of delivery (p<0.05) OR = 0.46. This indicates that mothers who have primipara status reduce their chances of giving birth at home rather than multiparas. Antenatal care (ANC) visits also had a significant relationship with the place of delivery (p<0.05) OR = 1.46. Mothers who had ANC visits less than 4 times had a 1.46 chance of giving birth at home compared to 4 or more visits. The history of complications did not show a significant association with the place of delivery (p>0.05). Mother’s knowledge factor had a significant relationship with the place of delivery (p<0.05) OR = 2.53. This shows that the knowledge of poor mothers has a 2.53 chance of giving birth at home.

The results can also be seen in table 2. Women who had less education only graduated from elementary school or not (Adjusted Odds Ratio (AOR): 2.69 [1.66-4.36]), were more likely to give birth at home than those who had a high education category junior high school (SMP) or higher. Primipara category parity (AOR: 0.47 [0.34-0.66]) is more likely not to give birth at home. Poor knowledge about health problems related to the risk of pregnancy or childbirth (AOR: 2.19 [1.57-3.06]) is more likely to give birth at home.

Table 2. Factors related to place of delivery in Muna Regency in 2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Analysis Bivariable</th>
<th>Multivariable analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted odds ratio (OR) 95% CI</td>
<td><em>ρ</em></td>
</tr>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risks</td>
<td>Ref. 1.02 (0.71-1.46)</td>
<td>0.920</td>
</tr>
<tr>
<td>Not risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Ref. 2.69 (1.66-4.36)</td>
<td>*0.000</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Discussion

WHO recommends safe delivery should be carried out in health facilities, but in this study more than two-fifths of respondents prefer homes as places of delivery. Most respondents give birth at the age of 20-35 years which is very good for mother’s safety. WHO emphasizes avoiding four too much in pregnancy which is too young (pregnancy <20 years), too old (pregnancy >35 years), too many children (more than 4) and too close (pregnancy distance <2 years)\(^6\).

Maternal education is a variable that significantly determines the use of health facilities as a place of delivery as has been proven in several previous studies (hagos, feyisa, adedookun). Higher levels of education will increase maternal knowledge, increase self-confidence and also increase awareness of the use of health resources in the community for maternal health (kawakatsu, feyissaa, adedokun). The same results were also found in this study, lower education tends to give birth more at home than those who have higher education. Employment is economically capable of empowering women to take responsibility for their own health and facilitate access to facilities\(^7\). Job is able to make. Independent and more capable mothers to use health facilities when giving birth\(^8\).

Appropriate antenatal care (ANC) awareness raises maternal awareness to seek appropriate and safe health delivery services\(^3, 12, 19\). The results of this study indicate that the frequency of ANCs that are less than 4 times tends to give birth at home. Complications during previous pregnancies are predicted to be carried out in health facilities. when problems arise during pregnancy, women report a desire to be in a facility\(^20\). In this study it was found that mothers who had experienced previous complications tended to give birth in health facilities. They worry that complications will occur again so they prefer to give birth in a health facility.

Knowledge of better maternal health is a determinant of delivery in a health facility. A study in Zambia of women who can pinpoint danger signs in pregnancy is more likely to give birth in a health facility than those without such knowledge \(^21\). Knowledge of high maternal health may positively influence women’s service-seeking behavior and enable it to recognize danger signs early. However, this mother’s knowledge may be the result of frequent contact with skilled health workers; therefore a prospective study is needed.\(^4\)
Conclusion

The results showed that maternal education, maternal occupation, parity, ANC frequency and maternal knowledge had a significant relationship with the choice of place of birth while the age variable and history of complications were not related.

Source of Fund: Self

Conflict of Interest: None

Ethical Clearance: From Faculty of Public Health Committeeee.

References


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Quality of Health Services in Kamonji Puskesmas Palu City

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¹Master Program in Public Administration, Tadulako University

Abstract

This research aims to know the Quality of Health Service at Kamonji Public Health Center in Palu City. Analyze to use the theory Zeithaml, Berry And Parasuraman with the descriptive research method qualitative and 5 informants of people determined with the technique of purposive sampling. 3 informant from circle of implementer of executor of health service and 2 informant from circle of goals of group or society paying a visit and medicalize the. Research during 2 month namely mid February up to April 2018. data collected with the observation, interview and documentation. Result of research show that quality of health service still have to be improve repaired and improved, 2 from 5 indicator not yet good. (1). Tangibles the building have to need the repair, column settlement, location of service column. (2). Responsiveness listen carefully the worker and (3). reliability have adequate. (4). Assurance record the sis and make-up of worker interest still require to be improved. Worker (5). empathy assessed by society have good.

Keywords : Service , Tangibles, Responsiveness, Reliability, Assurance, Empathy

Introduction

Health is a basic right of every person and all citizens are entitled to health services regulated in the 1945 Constitution. One of the health care units is Puskesmas. According to Minister of Health Regulation No. 75 of 2014, the function of Puskesmas as one of the first type of health service facility (FKTP) has an important role in national health system, especially health effort subsystem. To achieve the goals of national health development are carried out various health efforts are comprehensive, tiered and integrated. Puskesmas as one of the first-level health service facilities (FKTP) has specificity compared with other FKTP. (first clinic, individual practice place, etc.). There are several things that are the specificity of Puskesmas, among others: carrying out public health efforts (PHE/UKM) and have the concept of territory. With this specificity of course required good management in managing all efforts undertaken, all potential resources that will be different from other FKTP.

The function of puskesmas as a driver of health-minded development and community empowerment center to support healthy sub-districts and aims to create a society that has healthy behaviors that include awareness, willingness and ability to live healthy, able to reach quality health services, live in a healthy environment and have optimal health, both individuals, family groups and communities. In general, health services provided by Puskesmas include curative, preventive, promotive and rehabilitation services. Regulation of the Minister of Health of the Republic of Indonesia Number 75 of 2014 on Community Health Centers (Puskesmas) needs to have good health care and quality by health providers, therefore demanded a high performance from health providers themselves¹-³.

Puskesmas Kamonji has a working area of 7 kelurahan namely, silae, kabonena, lere, baru, ujuna, kamonji and siranindi. Up to the year 2017 the population of 51,209 inhabitants. It is a potential and a challenge and requires good management. The year 2016 recorded 22,042 male visits and 34,549 women, resulting in total visits of 56,591 times, with daily visits of up to 200 patients, excluding the visit of free puskesmas for free during the afternoon as many as 50 patients. However, health services at health centers kamonji still encountered various problems ranging from the form of buildings that have not been in accordance with the mandate Permenkes Number 75 year 2014, the number of rooms and division of poly, the arrangement of space / placement room, including the absence of separation of elderly and not elderly, adequate quantity and comfort, clean water supply, storage and treatment of medical
waste. The layout of service room in Puskesmas building must be arranged by paying attention to Puskesmas zone as building of health service facility.

Another aspect that is the inhibiting factor is the arrangement of medical records that should be an individual confidential document, still outside the room and can be accessed by anyone who is not interested because the placement is in the hall or corridor of the puskesmas. The condition of the registration queue, patient waiting room is relatively narrow and the old queue adds to the problems faced in the service at the counter.

However, there are important factors supporting the effort to improve the quality of health services in improving the quality of services that is the implementation and assessment of health center accreditation in health centers kamonji on 30 October to 2 November 2017. The main purpose of accreditation Puskesmas is to foster quality improvement, performance through continuous improvement of the system management, quality management system and service delivery system and program, and implementation of risk management, and not merely an assessment to obtain accreditation certificate.

Based on this, research on the quality of health services in UPTD Puskesmas Kamonji needs to be done, so that less than optimal service can be improved and service with the best quality can be maintained. By considering the field conditions as well as the support of information that researchers get from the community, then to menyengkapi the fact researchers are interested in raising this issue into scientific research.

In terms of academic research is expected to be a scientific reference, especially matters relating to the Quality of Health Services in UPTD Puskesmas Kamonji. Practically this research is expected to be a recommendation for the Health Office of Palu City, especially Health Center Kamonji in seeing and paying attention to the quality of health services in UPTD Puskesmas Kamonji

Materials and Method

Types of research

This research is qualitative descriptive research with inductive approach that research method by describing the state of research object at the present moment to the facts that appear in particular so that the general picture can be drawn without making comparisons with other variables.

Location And Time Research

The location of the research is UPTD Puskesmas Kamonji Palu with consideration that there are inhibiting factors in improving the quality of service at puskesmas kamonji, including the supporting factor that is the implementation of accreditation of puskesmas on 30 October until 2 November 2017. This research will be conducted approximately 2 month February up to April 2018.

Informant Research

The subjects and informants in this study were the visitors who went to the Kamonji Health Center and the individual health service implementers at Kamonji Community Health Center (Puskesmas Kamonji). The informant is determined by purposive sampling technique where the informant is determined by certain consideration or indicator and is the person or party that is directly related or able to give information about the implementation of health service at Puskesmas Kamonji Palu city.

Types and Data Sources

Primary data

Primary data is data obtained directly from informants by using interview guidelines.

Secondary data

Secondary data in this research is supporting data which is useful for researcher, because this data is obtained from research object, book, journal, internet and also documents containing information about research.

Sources of data in this study are all the results of observation, interview and collection of data that are considered important in determining the quality of service in Puskesmas Kamonji Palu City.

Definition of Operational Concepts

Based on the definition of the literature review, the authors focus on only one variable or independent variable of health service quality in Puskesmas Kamonji Palu with indicators as follows:
1) Quality of service can be identified by comparing patient satisfaction with the service they receive with the service they expect.

2) The health referred to in this study is a healthy state, both physically, mentally, spiritually and socially which enables everyone to live productively socially and economically. “

3) Puskesmas according to the regulation of health minister of the republic of Indonesia number 75 of 2014 is a health care facility that organizes public health efforts and individual health endeavors at the first level, with more prioritize promotive and preventive efforts, to achieve the degree public health as high as possible in its working area.

Results and Discussion

Puskesmas Kamonji is Technical Implementation Unit of Palu City Health Office geographically located in West Palu District but with working area covering two Subdistricts namely Palu Barat and Ulujadi Subdistricts. Kelurahan which is included in the working area of Kamonji Public Health Center consists of seven urban villages namely Kamonji, Silae, Kabonena, Lere, Baru, Ujuna, and Siranindi urban villages. Five urban villages are Palu Barat District while the other two urban villages are Kabonena and Silae sub-districts.

The work area of Kamonji Health Center is 82.53 Km2 which is divided into 41 RW and 136 RT. Puskesmas Kamonji has a network of health services five sub health centers (Pustu) and 7 village health posts (Poskesdes). The entire service network is dedicated to serve 51,537 people or 12,739 families. Most of the population in the working area of Kamonji Puskesmas is 54.2% is the productive age population

Description of Health Service at Kamonji Public Health Center

One of the factors to assess the amount of utilization of health center facilities as public health service facilities, can be seen from the number of visits in health centers. utilization of health facilities at UPTD Puskesmas kamonji in the year 2017 consists of male visits as much as 31,092 and women 50,497. when compared to 2016 and 2015, the number of patient visits medication tend to fluctuate. The trend of patient visits can be seen in the picture below:

![Figure 1. trend of patient visits by sex At Kamonji Health Center 2015 – 2017](source)

Source : Profil Puskesmas Kamonji, 2015,2016, 2017

Quality of Health Services at Kamonji Community Health Center

To analyze the health service quality of Puskesmas at UPTD Puskesmas kamonji, the writer choose 5 dimension the qualities proposed by Zeithaml, Berry and Parasuraman are physical tangibles, reliability, responsiveness, assurance and empathy.

Physical Appearance (Tangibles)

Physical appearance (Tangibles), meaning physical appearance of buildings, equipment, employees and other facilities owned by providers. The writer concludes the result of interview with Head of Puskesmas Kamonji (dr Rohmat Jasin) that the location of puskesmas kamonji is very strategic and easy to reach, however if seen from the physical condition of health center kamonji is now less than adequate and actually need to get the repair / rehab heavy thoroughly with adjusting the current requirement, especially referring to the mandate of RI health minister’s regulation number 75 year 2014. Then the authors conclude from the interview with (dr Meity Salatan) also explained that the health center kamonji get heavy rehab ration for this fiscal year 2018 The explanation of the informant of the implementor shows that there is an indication of the shortcomings and limitations of the Puskesmas building. The physical condition of the puskesmas now needs to get attention and repair as soon as possible, for the improvement and improvement of the quality of health service to the community of service users in Kamonji Community Health Center, which refers to Permenkes number 75 year 2014. Then the authors conclude from the interview with frequent service / patient recipients routinely seek treatment at puskesmas kamonji (mother of Siti Sumarni) that informant description above matching with decision of MENPAN Number 63 Year 2003 mentioned that service implementation must fulfill some
principles as among others completeness of facilities and infrastructure. The availability of adequate facilities and infrastructure, work equipment and other supporting facilities including providers of telecommunications technology and informatics technology\(^5\)\(^-\)\(^7\). Ease of Access Sites and locations and facilities of adequate services, easy to reach by the community, and can be utilized telecommunications and informatics technology. Comfort Environmental service should be orderly, organized, provided a comfortable waiting room, clean, tidy, beautiful and healthy environment and equipped with service support facilities, as well as parking, toilets, places of worship and others. Based on the results of interviews with all informants related to the physical appearance (Tangibles) we can conclude that the health center kamonji from the access side of service coverage, is very possible because it is on the main road, the physical condition of the building needs to get repair\(^8\)\(^,\)\(^9\).

**Responsiveness**

Responsiveness (Responsiveness) is the willingness to help service users and provide services in a sleek and responsive manner. The authors conclude the results of interviews with Kamonji Community Health Center Head (dr Rohmat Jasin) that focuses on improving and improving services to patients and the community as a whole regardless of social status or health insurance coverage at puskesmas. Types of services available in health centers kamonji stipulated in the clinical service guide clinic kamonji. In line with the above that the importance of carrying out every service by setting and applying quality standards as appropriate The same opinion was also shared by the person in charge of the medic record. Similarly, the authors conclude the interview result (doctor meaty) that his message is in line with Article 7 point d permenkes no.75 2014, stating that the provision of health services that prioritizes the security and safety of patients, officers and visitors. In carrying out his duties of energy health needs to obtain or follow activities or efforts to increase the competency of health personnel, all of them to support the achievement of healthy sub-district.

**Reliability**

Reliability is the ability to deliver consistently and accurately promised services. The authors conclude the results of interviews with the Head of the Kamonji Public Health Center (dr Rohmat Jasin) that the Staffing or executive staff is a serious problem in the public service. Not only the amount but also the skill or competence. In Kamonji Health Center, the number of health personnel in the health service effort is sufficient. In the law number 44 of 2009 article 31-32, explains the rights and obligations of patients to be considered in the overall service process that begins from registration. The rights and obligations of patients at UPTD puskesmas kamonji have been on the wall on the wall so that patients know their rights and obligations. Likewise, the rights and duties of doctors / nurses.

Explanation of the reliability delivered by other implementor informants (dr Meity) the authors concluded in improving the quality of public services are primed confronted several obstacles such as; lack of commitment from the service apparatus, they only carry out their tasks without thinking about the needs, desires and satisfaction of the community, lack of understanding of quality management, inability to change culture and behavior, inaccurate quality planning, ineffective human resources development program, facilities infrastructure services, financing, weakness incentive system, short-term orientation, performance information system has not been developed.

**Assurance**

Assurance is the knowledge, courtesy and ability of service providers in providing trust to users of the service From all informants the information can be drawn a conclusion that continuous supervision by the head of puskesmas towards the service provider will give positive leverage to the consistency of service. Evaluation during the service process through weekly briefings will be able to provide improvements to service efforts and increase awareness of officers in performing health services. Such as the appropriate implementation of the SOP, or revisions to the SOP if deemed necessary.

**Empathy**

Empathy (Empathy) is the ability to provide treatment or attention to service users individually / personally. If service indicators are achieved then customer satisfaction will be achieved. In line with the statement of the head of puskesmas kamonji (dr Rohmat Jasin) Based on survey results of community satisfaction index (IKM) conducted at 13 puskesmas in palu city in february - mei 2017, generally the performance performance of its service is categorized as “GOOD”
and “Very Good”. The health center kamonji from 2016 with good category with 71.65 niali become very good category in year 2017 with value 82.20. all elements of service get a perception value above the number 3 where the average element of service is 3.288.

Description of all informants has actually adopted a series of activities in the public service, in the framework of efforts to meet the needs of services in accordance with legislation and regulations for every citizen and residents of goods, services and or administrative services provided by the providers of public services, in this case the health center kamonji. As for the implementation using benchmark of service standard as the reference of service quality as obligation and promise of organizer to society in the framework of quality service, fast easy, affordable and measurable. Law No. 25 of 2009 (article 15-20) describes the rights of the community / organizers, the obligations of the community / organizers, including the prohibition of prohibition that must be obeyed in the provision of public services and One of the assessment criteria in a puskesmas accreditation is obliged to carry out the mandate.

Conclusions

Based on the results of the research note that the five dimensions of service quality used to determine the quality of health services in UPTD Puskesmas kamonji all have good quality trends, it can be concluded that health service Puskesmas in UPTD Puskesmas kamonji quality.

Ethical Clearance- Taken from Medical faculty ethical clearance committee

Source of Funding- Self

Conflict of Interest – None

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Balanced Nutrition Services to Early Childhood Improving Children’s Nutritional Status

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Abstract

Chronic malnutrition is caused by poverty, improper care, and parents’ ignorance of the nutritional needs of children. Providing a balanced menu is a kind of solution that can be applied to overcome nutritional problems in children. Balanced nutrition services are carried out in early childhood to improve children’s nutritional status. This research was conducted in Bangli District, Gianyar Regency, and Denpasar City, using a randomized pre and posttest control group design with a total sample of 88 children (38 controls and 50 intervention groups). Nutritional status was assessed by comparing weight with age using anthropometric standards based on Z-Score. The results of this study indicate that the intervention group experienced a decrease in the number of children with less weight (25.00%) and an increase in the number of children with good nutritional status (2.22%), while in the control group there was no change in nutritional status. The results of the independent sample t test showed that there were significant differences in the pre-data in the control group and intervention (p <0.05) while the post-data showed no significant differences (p > 0.05). Analysis of differences in body weight in the control and intervention groups showed that there were significant differences (p <0.05). Balanced nutrition services in early childhood can significantly improve their nutritional status.

Keywords: balanced nutrition services, early childhood, nutritional status

Introduction

Preschool age is a golden period because the physical and psychological development is hurried that its nutritional needs must be fulfilled and balanced. Nutritional problems occur in toddlers, especially malnutrition, are the effects of maternal conditions during pregnancy, fetal period, infancy, including diseases suffered during infancy. This situation can hamper children’s development with negative impacts that will take place in subsequent lives such as intellectual decline, susceptibility to disease, decreased productivity to cause poverty and the risk of giving birth to babies with low birth weight. Every parent certainly wants a balance between physical growth and optimal mental development in their children.

Data from WHO showed that underweight cases in preschoolers in the world were 15.7% and overweight 6.6%. Nationally, the prevalence of malnutrition in 2013 was 5.7% and malnutrition was 13.9%. The results of Riskesdas from 2007 to 2013 showed that underweight cases in Indonesia increased from 18.4% to 19.6%, Riskesdas 2010 and 2013 showed that births with Low Birth Weight (LBW) <2500 grams decreased from 11.1% to 10.2%. The trend of nutritional problems in Bali in 2015-2017 showed a case of malnutrition decreased from 9.0% in 2015 to 8.6% in 2017, with the highest prevalence in Buleleng Regency 14.4%.

Chronic malnutrition is caused by poverty, inappropriate parenting, and ignorance of parents regarding children’s nutritional needs. The results shown that children’s cognitive abilities were not developing optimally, children easily get sick and have low
competitiveness. The first thousand days of a child’s life are crucial that determine their future, and in that period Indonesian children faced serious growth disorders. The problem is, over 1000 days, the adverse effects of malnutrition are very difficult to treat. To overcome the incidence of malnutrition, especially mothers, need to be educated to understand the importance of nutrition for pregnant women and children under five years old/toddler.

The results from Ariati, et.al., (2018) get malnutrition cases in Bali Province were still high at 35.85% of children with underweight status and 3.77% over weight. Malnutrition cases in children with a Weight / Age index found in pre-school children are high enough that needs special attention. Children are the most valuable assets for the future of our nation.

Based on those description, giving a balanced nutrition service for early childhood is carried out and the knowledge of balanced nutrition is given to parents so that parents can provide a balanced menu by utilizing local food and food diversification to reduce malnutrition in Bali.

**Material and Method**

This study is a quasi-experimental design with different subjects (randomized pre and posttest control group design). This design was a parallel design, there were 2 groups of samples (control and intervention group). The study was conducted for two months from October to November 2018 in Bangli and Gianyar Regency as intervention group and Denpasar City as a control group with consideration:

1) There were still high malnutrition cases in the regency based on Bali Nutrition Problem Trend data for 2015-2017 (Bali Provincial Health Office, 2017) and the results of preliminary studies that have been conducted.

2) The location was easily accessible by researchers.

3) Availability of early childhood education institution, which the management has been ready to provide additional food for their students.

Determination of early childhood education institution as a place for multistage random research side due to: first selected 3 regencies/cities as random research sites, then from the three districts one early childhood education institution was chosen for which the management has been ready to provide additional food for their students. According to this method, the institution which has been selected such as Yudistira PAUD in Gianyar Regency and Handayani PAUD in Bangli Regency as intervention group, then Swadarma PAUD in Denpasar City as a control group.

Giving Balanced nutrition services in early childhood is a service in the form of counseling and education about Balanced Health and Nutrition to the parents and followed by making food menus for school children by utilizing local food followed by supplementary feeding and monitoring the development of children’s nutritional status with index Weight/Age (W/A). Nutritional status with a W/A index was assessed by comparing the child’s weight with age then compared to the standard. Descriptive data analysis includes age, sex, and body weight of the sample analyzed descriptively by means of the mean and standard intersections. The data homogeneity test was carried out by the Levene test at the level of confidence α = 0.05. If the data in the Control and Intervention Groups were homogeneous, then the analysis of the Independent Sample t-Test, and if were not homogeneous, then used the Man-Whitney difference test at the level of confidence α = 0.05. To compare nutritional status data (in the Control Group with the Intervention Group (O1 with O3 and O2 with O4), if the data were homogeneous, a parametric statistical test is performed (Independent Sample t-Test) and if not-homogeneous, a non-parametric statistical tests (Man Whitney at significance level α = 0.05).

**Results**

**Characteristics of Samples**

The samples observed were 88 children with characteristics as shown below in Figure 1, 2 and 3.

![Figure 1. Characteristics of samples based on age](image)

According to Figure 1, the average of samples in the Control Group was 57.13 months and in the Intervention
Group was 58.88 months.

The data in Figure 2 shown that male and female sex in the Control Group and Intervention Group were the same, while in the Intervention Group, male was more than female.

According to Figure 3, it has shown that the weight in the Control Group increased by 0.11%, while in the Intervention Group there was a greater increase of 8.51%.

Nutritional Status of Students based on Index W/A

Nutritional status assessment with weight/age index showed no change in children’s nutritional status in the Control Group between pre and post, while in the Intervention Group there was change significantly. Nutritional status data of the samples based on weight/age Index were presented in Table 1.

The data in Table 1 showed most of the samples had good nutritional status i.e. 84.22% in the Control Group and 92.00% in the Intervention Group. In the Control Group, there were samples with overweight and underweight each one 3 children (7.89%) and no cases of malnutrition were found. In the Intervention Group there was a decrease in the number of samples with underweight by 25%, from 4 people to 3 people. There was an increase in the number of samples with a good nutritional status of 2.22%, namely from 45 to 46 children, and there was no change in children with overweight, only 1 children.

Effect of Balanced Nutrition Services on Sample Nutritional Status

Sample homogeneity test and Independent Sample t-Test/Man-Whitney data on the Control and Intervention Groups as shown in Table 2.
Table 2. Homogeneity test and Independent Sample t-Test/Man-Whitney analysis Children weight in control and intervention groups

<table>
<thead>
<tr>
<th>Weight</th>
<th>Mean±SD</th>
<th>Homogeneity (p)</th>
<th>Differential test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(p) t/Z</td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>Control</td>
<td>17.54±3.32</td>
<td>0.422</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td>15.99±3.36</td>
<td></td>
</tr>
<tr>
<td>Post</td>
<td>Control</td>
<td>17.56±3.34</td>
<td>0.479</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td>17.35±3.36</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>Control</td>
<td>0.04±0.09</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td>1.37±0.67</td>
<td></td>
</tr>
</tbody>
</table>

Data on body weight homogeneity test results in the Control and Intervention Groups by using Levene Test at the level of confidence $\alpha = 0.05$ showed $p \geq 0.05$, indicated that the data in both groups were homogeneous, then followed by Independent Sample t-Test at the level of confidence $\alpha = 0.05$. Where as in the control group and intervention differences in weight gain $p < 0.05$, the data in the two groups were not homogeneous so that it continued with the Man-Whitney test at the level of confidence $\alpha = 0.05$.

The results of differential test were pre data in the Control Group and Intervention obtained a value of $p < 0.05$, which showed a significant difference in the child’s body weight data in the Control Group and Intervention. The body weight average of samples in the Control and Intervention Groups was not the same, this can be seen from the difference in mean pre body weight in the Control group (17.54 kg) and pre in the Intervention Group (15.99 kg). Post data (after intervention) in the Control Group and Intervention got a value of $p \geq 0.05$ which showed no significant difference. The mean data of body weight in the Control Group (17.56 kg) and in the Intervention Group (17.35 kg) were the same. The child’s body weight increased significantly after being treated (8.51%). While the analysis of the difference in body weight in the Control and Intervention Groups obtained a $p$ value of $<0.05$, indicated that there was a significant difference in the data of the sample weight in the Control Group and Intervention. Those shown that giving balanced nutrition services can increase child’s weight.

**Discussion**

**Children’s Nutritional Status**

Nutrition intake obtained from food consumed is useful for brain growth (intelligence) and physical growth. Physical growth was assessed by measuring the nutritional status of children, can be seen from their general appearance (weight and height), physical, motoric, functional, emotional and cognition signs. Based on anthropometric measurements, healthy children will get older, gain weight, and height are associated with adequate intake of macronutrients, calcium, magnesium, phosphorus, vitamin D, iodine, and zinc.

Nutritional status assessment in this study used body weight and age measurement, then compared with anthropometric standards based on Z-Score value. Assessment of nutritional status with weight/age index found that most of the samples (in the Control and Intervention Groups) were of good nutritional status. The same was reported by Sa’diya (2015) who found that most of the samples studied were of good nutritional status (76.4%)\(^9\). Kumala (2013) who examined the relationship between feeding patterns and nutritional status of children aged 1-3 years in Sidomulyo Godean Sleman Yogyakarta also reported that most of the samples examined were of good nutritional status (80%)\(^10\).

**B. Effect of Balanced Nutrition Services on Sample Nutritional Status**

A good diet consists of consuming quality foods, namely consumption of healthy and varied foods, and
adequate food consumption in terms of quantity followed by applying the right eating behavior. If this is applied, it will produce a normal nutritional status of the child. Analysis of the difference in body weight in the Control Group and Intervention group obtained a p value of <0.05 which indicated that there was a significant difference. It showed that giving balanced nutrition services in early childhood can improve children’s nutritional status.

Nutritional status is an expression of the state of balance in the form of certain variables. It mentioned that nutritional status as an expression of the state of balance from consumption of food to nutritional needs. Research by Sari, et al., (2016) found that there was a significant relationship between diet and nutritional status of children aged 3-5 years in the work area of the health center Nangalo Padang. Other research that revealed the relationship between consumption patterns and nutritional status was stated by Sa’diya (2015) found that there was a relationship between diet and nutritional status of preschool children at PAUD Tunas Mulia Village in Claket, Pacet District, Mojokerto District, Myrnawati and Anita (2016) who examined the effect of nutritional knowledge, socioeconomic status, lifestyle and diet on children’s nutritional status, and there was a positive direct influence on diet on the nutritional status of early childhood. These studies showed that the eating patterns have a major influence on the growth and nutritional status of children, so that they must get serious attention from parents and the government if we want the children to grow up healthy and optimally.

Playing and schooling at this early age make children often delay their eating time, often asks for food only before going to bed when he is too tired to move all day and just hungry at night. The attention of parents in providing food to children is very important so that children’s nutritional intake is fulfilled and according to their needs. At this age the child also starts playing a lot with his friends so they will catch the disease easily. It is necessary to instill diverse and nutritious eating habits and a clean lifestyle. The percentage of the type of food consumed must also be in accordance with the RDA, which is 50-70% of carbohydrates, 15-30% of fat, 10-15% of protein, the rest are vitamins and minerals. The principle of early childhood food 4-6 years is the same as adult food, it’s just that it needs to be considered an interesting presentation then children are happy and interested in eating.

Conclusion

Giving balanced nutrition services in early childhood are considered to increase child’s weight significantly. The evidence has been shown by the analysis of the differential tests, that there were significant differences (p <0.05) between the body weight before and after intervention in the Control Group and Intervention Group. Further study in balanced nutrition service program for early childhood is needed to continue and develop to achieve 100% children with good nutritional status.

Conflict of Interest: All of the authors contributed to writing this paper and declare no conflict of interest.

Ethical Clearance: Ethical Clearance obtained from the Ethic Committee, Health Polytechnic of Denpasar, Ministry of Health of Indonesia and respondent assignment.

Acknowledgment: We would like to acknowledge the cooperation, commitment and kind support of the subjects. We would also like to thank Health Polytechnic of Denpasar, Ministry of Health of Indonesia and Early Childhood Education Training Center, Ministry of National Education of the Republic of Indonesia for supporting this research.

References


Are Sellers Who Have Low level of Knowledge, Attitudes and Practice Selling Snacks With Harmful Food Additives?
(Study of Street Food Vendors at Tadulako University, Indonesia)

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Abstract
This study is conducted to analyze the content of preservatives, sweeteners and harmful dyes in snack foods at Tadulako University and find out the knowledge, attitudes and practices of the seller about food additives. This type of research is descriptive with the research sample were three snacks sellers at Tadulako University. The foods studied were meatballs, tofu, tomato sauce and ice syrup. The results showed that all meatballs and fried tofu were not contaminated with borax and formalin preservatives. Tomato snacks tartrazine tainted tomato sauce, sunset yellow, and ponceau 4R. Syrup ice is exposed to sweetener benzoate, sorbate, saccharin and cyclamate. Benzoic sweetener and sorbate are still below the detection limit. Saccharin does not exceed the threshold, while the cyclamic sweetener at one seller exceeds the Indonesia National Standard threshold. Respondents who have lower knowledge scores, attitudes and practices than other respondents sell sweetened drinks more than the allowable Indonesia National Standard limit. Conclusions are tomato sauce and ice food snack syrup sold at Tadulako University which are contaminated with dyes and respondents with low knowledge, attitude and practices sell snacks with higher sweetener content.

Keywords: preservative, sweetener, snack

Background
The substance of preservatives, dyes and sweeteners which should be used in non-food industries because of their substance can be harmful to the human body if used as an additive in food1. Hazardous preservatives used by food producers are namely borax and formalin2. The use of preservatives, sweeteners and dyes in snack foods is strongly influenced by the seller, especially those who are directly involved with the manufacturing process3.

Sellers who are aware of the use of appropriate food additives tend to sell food that is free of hazardous food additives4. However, some studies also show that knowledge is not the only thing that influences sellers to sell food which is free of harmful additives5. This is proven by the fact that sellers who sell snacks with dangerous additives such as borax are still found6.

Research on food safety, especially the use of preservatives, sweeteners and dyes at Tadulako University has never been done. The use of substances that do not comply with the rules can be harmful to health. While the seller’s knowledge, attitudes and practices are also important to know to provide an overview of the practice of using food additives that are inappropriate.

Source and Method
Type of Research
The type of research used was descriptive. This research was conducted at Tadulako University from May to July 2017.
Population and Sample

The research population was all snacks sellers at Tadulako University. The sampling technique used was purposive sampling. As many as one seller in each of the three faculties that have many customers and in demand by students is chosen as a sample. Food snacks taken at each seller to be tested are meatball, tofu and ice syrup.

Method of collecting data

The data collected in this study are data on substance of preservatives, sweeteners and harmful dyes in snack foods. The study was conducted qualitatively in the laboratory using resorcinol method to test saccharin (SNI 01-2893-1992), the schryver method was used to identify formalin, precipitation method to test cyclamate (SNI01-2893-1992), and paper layer chromatography using wool yarn to test the dye (SNI 01-2895-1992).

Interviews with questionnaires contained instruments of knowledge, attitudes and practices carried out on snack vendors. The level of knowledge states the respondents’ knowledge regarding food additives measured by questions totaling 13. The results obtained are then categorized to be good (80-100%), moderate (60-79.99%) and less (<60%). All respondents signed written informed consent and agreed to participate in the study.

Data Analysis

Analysis is done to get an overview or description of the types of snack foods containing preservatives, dyes and sweeteners. Descriptive analysis is also conducted to determine the level of knowledge, attitudes, and practices on the use of hazardous food additives in snack-seller.

Result

Dangerous Food Additives

Table 1 shows that all meatballs and fried tofu do not contain borax and formalin. In meatball sauce, it is known that A1 and A2 sauce contaminated tartrazine and sunset yellow dyes but it is free of methanyl yellow and ponceau 4R while sauce B1, B2, C1 and C2 are contaminated with tartrazine dye, sunset yellow, ponceau 4R but free from methanyl yellow (Table 2).

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Dye</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boraks</td>
</tr>
<tr>
<td>1</td>
<td>Meatball A1</td>
<td>Negatif</td>
</tr>
<tr>
<td>2</td>
<td>Meatball A2</td>
<td>Negatif</td>
</tr>
<tr>
<td>3</td>
<td>Meatball B1</td>
<td>Negatif</td>
</tr>
<tr>
<td>4</td>
<td>Meatball B2</td>
<td>Negatif</td>
</tr>
<tr>
<td>5</td>
<td>Meatball C1</td>
<td>Negatif</td>
</tr>
<tr>
<td>6</td>
<td>Meatball C2</td>
<td>Negatif</td>
</tr>
<tr>
<td>7</td>
<td>Fried Tofu A1</td>
<td>Negatif</td>
</tr>
<tr>
<td>8</td>
<td>Fried Tofu A2</td>
<td>Negatif</td>
</tr>
<tr>
<td>9</td>
<td>Fried Tofu B1</td>
<td>Negatif</td>
</tr>
<tr>
<td>10</td>
<td>Fried Tofu B2</td>
<td>Negatif</td>
</tr>
<tr>
<td>11</td>
<td>Fried Tofu C1</td>
<td>Negatif</td>
</tr>
<tr>
<td>12</td>
<td>Fried Tofu C2</td>
<td>Negatif</td>
</tr>
</tbody>
</table>
Table 3 shows that benzoate and sorbate sweeteners on A1 and A2 syrup ice were below the detection limit, while saccharin and cyclamate exposure were 38.05 mg / kg and 513.86 mg / kg respectively. On B1 and B2 syrup, benzoate, sorbate and saccharin sweeteners were still below the detection limit but cyclamate exposure was 499.19 mg / kg. Likewise in C1 and C2 syrup it was found that benzoate, sorbat and saccharine sweetener were exposed under detection, but cyclamate exposure was 368.87 mg / kg.

Table 2. Dye Analysis on Meatball Sauce

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Pemanis</th>
<th>Saccharin (mg/kg)</th>
<th>Cyclamate (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Benzoate</td>
<td>Sorbate</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Syrup Ice A1</td>
<td>-</td>
<td>38,05</td>
<td>513,86</td>
</tr>
<tr>
<td>2</td>
<td>Syrup Ice A2</td>
<td>-</td>
<td>38,05</td>
<td>513,86</td>
</tr>
<tr>
<td>3</td>
<td>Syrup Ice B1</td>
<td>-</td>
<td>-</td>
<td>499,19</td>
</tr>
<tr>
<td>4</td>
<td>Syrup Ice B2</td>
<td>-</td>
<td>-</td>
<td>499,19</td>
</tr>
<tr>
<td>5</td>
<td>Syrup Ice C1</td>
<td>-</td>
<td>-</td>
<td>368,87</td>
</tr>
<tr>
<td>6</td>
<td>Syrup Ice C2</td>
<td>-</td>
<td>-</td>
<td>368,87</td>
</tr>
</tbody>
</table>

Table 3. Sweetener analysis on syrup ice

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Dye</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tartrazin</td>
</tr>
<tr>
<td>1</td>
<td>Sauce A1</td>
<td>Positif</td>
</tr>
<tr>
<td>2</td>
<td>Sauce A2</td>
<td>Positif</td>
</tr>
<tr>
<td>3</td>
<td>Sauce B1</td>
<td>Positif</td>
</tr>
<tr>
<td>4</td>
<td>Sauce B2</td>
<td>Positif</td>
</tr>
<tr>
<td>5</td>
<td>Sauce C1</td>
<td>Positif</td>
</tr>
<tr>
<td>6</td>
<td>Sauce C2</td>
<td>Positif</td>
</tr>
</tbody>
</table>

Table 4. Knowledge, Attitudes and Practices of Street Food Sellers Regarding Food Additives

<table>
<thead>
<tr>
<th></th>
<th>Knowledge</th>
<th>Attitude</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seller A</td>
<td>69.2 (moderate)</td>
<td>77.3 (moderate)</td>
<td>79.5 (High)</td>
</tr>
<tr>
<td>Seller B</td>
<td>76.9 (moderate)</td>
<td>79.5 (moderate)</td>
<td>90.9 (High)</td>
</tr>
<tr>
<td>Seller C</td>
<td>76.9 (moderate)</td>
<td>86.4 (High)</td>
<td>100 (High)</td>
</tr>
</tbody>
</table>

Knowledge, Attitudes and Practices of Food Sellers

All respondents had moderate knowledge regarding food additives (table 4). All respondents knew that borax is a dangerous ingredient when added to food. All respondents also knew that not all dyes could be used as food coloring agents. However, one respondent claimed he did not know if formalin was not allowed to be used as food additives. All respondents agreed that the snack maker who added dangerous additives on the sale would have been accidental. Respondents also claimed that they did not use artificial dyes and did not add borax to meatballs or knew about the sale.
Discussion

The research shows that all meatballs and fried tofu samples sold are not contaminated with borax and formalin. Borax and formalin are prohibited preservatives according to the Regulation of Minister of Health Republic of Indonesia No. 235 / Menkes / VI / 1984. Borax has the second largest toxic effect after sodium nitrite. However, several other studies have shown that snack foods contain borax and formalin. Research carried out by Saymona and Dewi (2013) at the University of Indonesia, found that 3.8% of the food samples tested positive contained borax chemicals, which came from two meatball samples and one sample of noodles.

In the sample of sauce A1, A2 which was analyzed qualitatively as dye material was obtained a result that the tomato sauce used a mixture of various types of coloring agents. The coloring material is; sunset yellow and tartrazin. Whereas in samples of sauce B1, B2, C1 and C2 tartrazine was contaminated, sunset yellow, and ponceau 4R. The type of dye above is a type of synthetic dye which is permitted based on RI Minister of Health Regulation No. 722 / Menkes / Per / IX / 88. However, in this study, there are no quantitative tests carried out so it is not known whether the number of existing dyes exceeds the limit set by Permenkes. Dyes such as tartrazine, erythrosine and sunset yellow are high among some individuals due to food intake containing high dye concentrations (9.45 and 4.0 mg). Analysis of snack foods using tartrazine coloring mixtures, sunset yellow whose levels are more than 300 ppm. Acceptable Dietary Intake (ADI) for permissible synthetic colors varies from 0.1 to 25 mg per body weight.

Analysis of benzoate and sorbate sweetener in all syrup ice samples showed below the detection limit, while saccharin in syrup samples in Faculty A was exposed to 38.05 mg / kg and cyclamate in all samples of Faculties A, B and C each of 513.86 mg / kg, 499.19 mg / kg, and 368.87 mg / kg. Although exposure to saccharin, the amount of saccharin in syrup in Faculty A does not exceed the maximum limit of 500 mg / kg. While cyclamate exposure in all samples also does not exceed the threshold that is a maximum of 1000 mg / kg. Other studies show that there were 8% samples of School-food (SF) containing sodium cyclamate.

In this study, all respondents were of moderate knowledge and only one respondent had a high attitude and practice score in the use of food additives. Respondents who have high attitudes and practice scores sell snacks that do not contain formalin and borax and use permitted dyes and artificial sweeteners that do not exceed SNI (Indonesia National Standard) limits. Other studies show that there is a correlation between the level of education of traders and knowledge of hazardous materials such as formalin and borax and artificial sweeteners. Research on one Philippine campus found that traders proved not to be very knowledgeable about food legislation and there was a significant gap between knowledge and practice food manufacturing is associated with the tendency of street vendors to compromise food security due to financial problems. Likewise with the practices of respondents, sellers who sell sweetened drinks are more than the standard permitted according to SNI claiming to be forced to use artificial sweeteners due to expensive sugar prices. Sellers tend to look for large profits with small capital so that they sometimes ignore customer health.

Conclusion

Meatball snacks and fried tofu are not contaminated with borax and formalin. Sauce tomato is contaminated by Tartrazine dye, sunset yellow, and ponceau 4R. Syrup ice is exposed to benzoate, sorbat, saccharin and cyclamic sweeteners, but benzoate and sorbate sweeteners are still below the detection limit. Similarly, saccharin does not exceed the threshold. While the cyclamic sweetener on ice syrup in one of the sellers exceeds the SNI limit. Respondents who have lower knowledge scores, attitudes and practices than other respondents do not sell food containing borax and formalin but sell sweetened drinks more than the permitted limits of SNI. Educational efforts for the use of food additives in food vendors are needed.

Ethical Clearance: Taken from Health Faculty of Public Health Tadulako University committee.

Source of Funding: Faculty of Public Health, Tadulako University.

Conflict of Interest: None

References


Dominant Factors of Metabolic Syndrome among a Sample of School Teachers in Jakarta, Indonesia

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Abstract

Metabolic syndrome leading to cardiovascular diseases and type 2 diabetes, is caused by several factors. This study aims to identify the dominant factor of metabolic syndrome. A cross-sectional study was conducted to 138 school teachers. Data collected through anthropometric measurement, blood sample collection and interview. Physical activity level was assessed using GPAQ questionnaire, while teaching activity was assessed using questionnaire. Data were analysed using chi-square for all dependent variables and simple logistic regression analysis for variable of age, BMI, and abdominal circumference. 24.6% teachers were diagnosed with metabolic syndrome. There was an association between age, BMI, abdominal circumference, physical activity, and teaching activity with metabolic syndrome (p<0.05). The analysis further showed no relation but a tendency that teachers with married status, cholesterol intake >200 mg/day, carbohydrate intake >60% of total energy, frequency of vegetables consumption <4x/week, and sleep duration ≤7 hours/day were more likely to have metabolic syndrome. Multivariate analysis showed that BMI was the dominant factor of metabolic syndrome in teachers (OR=14.797; 95% CI -1.73 - 126.35).

Keywords: abdominal obesity, adults, body mass index, metabolic syndrome, obesity

Introduction

Epidemiological transition during modernization nowadays shifted the lifestyle of most of the people and lead to the increase risk of degenerative diseases, worsened by the increase of obese prevalence. Data in Indonesia showed the increase of obese from 21.7% in 20101 to 28.7% in 20132. Even worse, 13.4% cause of death was due to cardiovascular diseases3. The emergence of cardiovascular disease is caused by the occurrence of several risk factors called metabolic syndrome. A study found that person with metabolic syndrome have three times greater risk of having heart attack/stroke and two times higher risk of death compared with those without metabolic syndrome4. In 2001, NCEP-ATP III define metabolic syndrome as an abnormal metabolic including minimal 3 out of 5 conditions (central obesity, elevated plasma glucose level, blood pressure, triglyceride level, and low HDL-C). Prevalence of metabolic syndrome worldwide is 15-30%5 and half of it occurs in developing countries. In Asian population, using the same definition, prevalence of metabolic syndrome was ranged 10-15%6.

Recent studies demonstrated that obesity increase the risk of metabolic syndrome7,8, at least 31.1% respondents with metabolic syndrome is obese9. Obesity is a condition of excess fat mass in the body which known from BMI measurement. Besides BMI, dietary intake and physical activity also contribute to the development of metabolic syndrome. Excessive energy intake which not accompanied by daily physical activity will cause positive energy balance and fat accumulation in adipocyte tissue. Research among the Samoan-American adults showed that modern dietary pattern which illustrated by the increase in energy and

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cholesterol intake resulted in an increase of triglyceride level\(^{10}\). Another research developed at Padang, Indonesia revealed that people with metabolic syndrome having higher energy and carbohydrate consumption but low in fibre and omega \(^{3}\).

Prevalence of metabolic syndrome in Jakarta reached 28.4\% and it is higher than national prevalence\(^{11}\). The metabolic syndrome in Indonesia counts as a public health problem that need to be addressed because its prevalence was >15\%. However, the study to find the factors related to metabolic syndrome remains limited. According to early observation, teachers spending at least 8 hours per day for sitting in the classroom, means that teachers had lower physical activity compared to others profession. Moreover, we found that 50\% of teachers was obese which made it more susceptible to metabolic syndrome and it is worse considering that teacher is a role model of healthy condition for children. Based on that facts, this research aims to observe the dominant risk factor related to metabolic syndrome among teachers in Jakarta, Indonesia.

**Material and Method**

A *cross-sectional* design was used in this study. The sample size calculated using test for difference in 2 independent proportions, with \(P_{1} 0.07\) and \(P_{2} 0.25\) from previous study of metabolic syndrome determinant\(^{10}\) resulted minimum sample was 128\(^{12}\). One-hundred and thirty-eight school teachers who met inclusion criteria determined by *multistage random sampling* method were recruited in this study. The inclusion criteria including teacher aged >20 years old, while the exclusion criteria were pregnant or sick during the study. Age, marital status, physical activity, teaching activity, and sleep duration were collected through interview using structured questionnaire and validated GPAQ, whereas nutrient intake was retrieved from 2x24hr *food recall* interview and FFQ then analyse using Nutrisurvey. Anthropometric data (weight, height, waist and abdominal circumference) were collected by direct measurements using digital scale, *microtoise*, and elastic bands. As a quality control, all measurements were done by trained enumerator (nutrition students).

Data of HDL-C, triglyceride and plasma glucose were done in standardized laboratory. Every subject suggested to fast for 12 hours, not doing exercise and smoking before the blood sampling. Blood pressure was measured by nursing using *Sphygmomanometer*. Metabolic syndrome was diagnosed using NCEP-ATP III diagnosis criteria\(^{13}\). *Chi-square* test was used to observe the association between metabolic syndrome and independent variables with 95\% CI and \(P\) value <0.05. For multivariate analysis, simple logistic regression was used to observe the independent variable that have highest association to metabolic syndrome.

**Ethical Consideration:** This study has been approved by IRB at Faculty of Public Health Universitas Indonesia (Ref No: 37/H2.F10/PPM.00/2013).

**Findings**

On average, respondents aged 45 years ± 10.07, women (77.5\%) and had been married (89.9\%). Mean of respondent’s waist circumference was 82 cm ± 1.07 (60.55 – 111.00 cm). Central obesity which sign by high waist circumference was the most common criteria found in respondent, accounted for 47.8\%, then followed by hypertension (38.4\%), low HDL-C level (37.7\%), 26.1\% of low triglyceride level and high fasting plasma glucose as much as 12.3\%.

Based on NCEP-ATP III diagnosis criteria, 34 respondents (24.6\%) were having metabolic syndrome and the rest 75.4\% were not having metabolic syndrome. Table 3 shows frequency of nutritional status, nutrients intake, and lifestyle variables. The analysis revealed that two-thirds respondents were overweight and obese and more than two-thirds of them were also having high abdominal circumference. Mean respondent’s BMI was 27.14 kg/m\(^{2}\), while mean abdominal circumference was 91.48 cm. Analysis of food consumption includes carbohydrate, cholesterol, and frequency of vegetable consumption. The result showed that one-fourth subjects were having carbohydrate intake >60\% of total energy and vegetable consumption frequency <4x/week, even more than a half respondent were having cholesterol intake >200 mg/day. Lifestyle variables measured includes physical activity, teaching activity, and sleep duration. Based on physical activity, more than half of respondents were having light to moderate physical activity and only 16\% having intense physical activity. Whereas for teaching activity, proportion between teacher mostly sitting, standing, and walking during teaching were almost the same (±31\%). Lastly, four-fifth respondents have sleeping duration ≤7 hours/day.
Bivariate and multivariate analysis

The association between metabolic syndrome and several risk factors was tested using chi-square analysis and presented in table 3. Results revealed the association between age, BMI, abdominal circumference, and teaching activity with metabolic syndrome (P<0.05). While other variable with P>0.05 did not show any significant association with metabolic syndrome but showing tendency that respondent with married status, cholesterol intake >200 mg/day, carbohydrate intake >60% of total energy, vegetables consumption <4x/week, and sleep duration ≤7 hours/day are more likely to have metabolic syndrome. Multivariate analysis then showed that an individual with BMI >25kg/m² have 14.79 higher risk to develop metabolic syndrome (table 4).

Table 1. Frequency of metabolic syndrome criteria

<table>
<thead>
<tr>
<th>MS criteria</th>
<th>n</th>
<th>%</th>
<th>SD (min-max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist circumference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central obese</td>
<td>66</td>
<td>47.8</td>
<td>±1.07 (60.55-111 cm)</td>
</tr>
<tr>
<td>Normal</td>
<td>72</td>
<td>52.2</td>
<td></td>
</tr>
<tr>
<td>Blood pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>53</td>
<td>38.4</td>
<td>±18.52 (systole)/±71.19 (diastole) (80/60 -198/110 mmHg)</td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>61.6</td>
<td></td>
</tr>
<tr>
<td>HDL-cholesterol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>52</td>
<td>37.7</td>
<td>±11.49 (29-104 mg/dl)</td>
</tr>
<tr>
<td>Normal</td>
<td>86</td>
<td>62.3</td>
<td></td>
</tr>
<tr>
<td>Triglyceride</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>36</td>
<td>26.1</td>
<td>±53.48 (40-298 mg/dl)</td>
</tr>
<tr>
<td>Normal</td>
<td>102</td>
<td>73.9</td>
<td></td>
</tr>
<tr>
<td>Fasting plasma glucose</td>
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<tr>
<td>High</td>
<td>17</td>
<td>12.3</td>
<td>±76.45 (62-301 mg/dl)</td>
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<tr>
<td>Normal</td>
<td>121</td>
<td>87.7</td>
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Table 2. Frequency of nutritional status, food consumption, and lifestyle variables

<table>
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<th>Variables</th>
<th>n</th>
<th>%</th>
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</thead>
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<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over-nutrition</td>
<td>89</td>
<td>64.5</td>
<td>4.45 (17-39 kg/m²)</td>
</tr>
<tr>
<td>Normal</td>
<td>49</td>
<td>35.5</td>
<td></td>
</tr>
<tr>
<td>Abdominal circumference (cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥90cm/≥80cm</td>
<td>108</td>
<td>78.3</td>
<td>1.09 (67.4-120.5 cm)</td>
</tr>
<tr>
<td>Normal</td>
<td>30</td>
<td>21.7</td>
<td></td>
</tr>
<tr>
<td>Cholesterol intake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;200 mg/day</td>
<td>62</td>
<td>44.9</td>
<td></td>
</tr>
<tr>
<td>≤200 mg/day</td>
<td>76</td>
<td>55.1</td>
<td></td>
</tr>
<tr>
<td>Carbohydrate intake</td>
<td></td>
<td></td>
<td></td>
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</table>
Continued. Table 2. Frequency of nutritional status, food consumption, and lifestyle variables

<table>
<thead>
<tr>
<th>Frequency of vegetable consumption</th>
<th>60% total energy</th>
<th>≤60% total energy</th>
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</thead>
<tbody>
<tr>
<td>&lt;4x/week</td>
<td>30</td>
<td>21.7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>≥4x/week</td>
<td>108</td>
<td>78.3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical activity</th>
<th>Light</th>
<th>61</th>
<th>44.2</th>
<th>-</th>
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</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>55</td>
<td>39.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Intense</td>
<td>22</td>
<td>16.0</td>
<td>-</td>
<td>-</td>
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<table>
<thead>
<tr>
<th>Teaching activity</th>
<th>Sitting</th>
<th>43</th>
<th>31.2</th>
<th>-</th>
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</thead>
<tbody>
<tr>
<td>Standing</td>
<td>43</td>
<td>31.2</td>
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<td>-</td>
</tr>
<tr>
<td>Walking</td>
<td>52</td>
<td>37.7</td>
<td>-</td>
<td>-</td>
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</table>

<table>
<thead>
<tr>
<th>Sleep duration</th>
<th>≤7 hours/day</th>
<th>113</th>
<th>81.9</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;7 hours/day</td>
<td>25</td>
<td>18.1</td>
<td>-</td>
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</tbody>
</table>

**Table 3. Bivariate analysis results**

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independent variables</th>
<th>P value</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolic syndrome</td>
<td>Age</td>
<td>0.006*</td>
<td>5.71 (1.63-19.94)</td>
</tr>
<tr>
<td></td>
<td>Marital status</td>
<td>0.535</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>BMI</td>
<td>0.000*</td>
<td>28.29 (3.73-214.60)</td>
</tr>
<tr>
<td></td>
<td>Abdominal circumference</td>
<td>0.005*</td>
<td>12.76 (1.67-97.65)</td>
</tr>
<tr>
<td></td>
<td>Carbohydrate intake</td>
<td>0.441</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Cholesterol intake</td>
<td>0.627</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Vegetable cons. frequency</td>
<td>0.332</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Physical activity</td>
<td>0.041*</td>
<td>2.11 (0.96-4.63)</td>
</tr>
<tr>
<td></td>
<td>Teaching activity</td>
<td>0.030*</td>
<td>0.59 (0.36-0.95)</td>
</tr>
<tr>
<td></td>
<td>Sleep duration</td>
<td>0.268</td>
<td>-</td>
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</table>

*) P value < 0.05

**Table 4. Simple logistic regression (final model)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>P value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.073</td>
<td>3.356</td>
<td>0.893 - 12.610</td>
</tr>
<tr>
<td>BMI</td>
<td>0.014</td>
<td>14.797</td>
<td>1.733 - 126.354</td>
</tr>
<tr>
<td>Abdominal circumference</td>
<td>0.371</td>
<td>2.805</td>
<td>0.293 - 26.895</td>
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</tbody>
</table>
Discussion

The metabolic syndrome prevalence in schoolteachers’ population was 24.6%. Those prevalence was higher compared to other region such as Indonesia (24.4%)9, Semarang (16.6%)14, Depok (23.8%)15, USA (23.7%)16, and Thailand (21.9%)17. High prevalence of metabolic syndrome in teachers was likely due to the respondent’s characteristics that is more than two-thirds aged above 40 years. It is also found that age have strong association with metabolic syndrome and also relevant with some previous studies which describe that risk of metabolic syndrome will increase at age above 407,13.

As the increasing of age, specifically over 30 years old, body fat will increase due to a decrease in the strength of energy combustion up to 10% every 10 years which causes fewer calories burnt and lead more calories stored as fat in the body. The increase of age also causes a decrease in muscle mass while fat tissue increases, both causing the accumulation of free fatty acid (FFA) in the body then increase risk of metabolic syndrome18.

Marital status didn’t show an association but a tendency that metabolic syndrome proportion was higher in the married group. Previous study explained that marriage is the main social relationship in most adults and become unhappy in marriage could lead to potential psychosocial stressor and will increase the risk of metabolic syndrome19. This study found an association between BMI and abdominal circumference with metabolic syndrome. The proportion of metabolic syndrome among respondents with BMI ≥25 kg/m² reached 37.1% and 30.6% among respondents with high abdominal circumference. The results in line with some previous studies8,20,21,22. On the condition of excess fat, adipocyte cell will maintain energy balance by releasing Interleukin-6 (IL-6), Tumor Necrosis Factor-α (TNF-α), and Monocyte Chemotatic Protein-1 (MCP-1). Both IL-6 and TNF-α will trigger the formation of C-Reactive Protein (CRP) in the liver, which, if produced continuously may worsen the inflammatory condition. In addition, obesity condition also followed by an increase in fat metabolism which lead the production of Reactive Oxygen Species (ROS) and results in the increase of oxidative stress. Oxidative stress cause dysregulation of adipose tissue and its a sign of early pathophysiology of metabolic syndrome. Moreover, adipocytes cells in the abdominal area are larger and less sensitive to antilipolysis which impacted on the increase production of FFA and triglycerides, the decrease in HDL-C mediated by CETP enzyme23.

Diet high in carbohydrates, particularly complex carbohydrate causes an increase in reserves glycaemic index24. Subsequently, the excess carbohydrate in the body will convert into fat in the liver then taken to the adipocytes which can store unlimited amounts of fat, causing obesity and higher risk of metabolic syndrome. Increasing in cholesterol intake also elevate the risk of metabolic syndrome through escalation of triglycerides and decrease of HDL-C. Cholesterol and saturated fat will activate LDL-C receptor which can increase LDL-C level and triglyceride in the bloodstream25. Frequency of vegetable consumption ≥4x/week regularly already proved in lowering CRP plasma concentration so it can reduce the risk of metabolic syndrome.

Physical and teaching activity also known as risk factors that significantly associated to metabolic syndrome which parallel with result of previous studies25,26. Light physical activity lead to the decrease of skeletal muscle insulin sensitivity then cause insulin resistance and metabolic syndrome. Besides, more time spending for sitting together with high calorie intake will cause obesity which associate with the increase of FFA in plasma26,27. Lastly, short sleep duration might also play role in the development of metabolic syndrome even though the relationship was not statistically significant. Short sleep duration could increase ghrelin hormone concentration which causes hungry and might lead to higher energy intake28. Besides, shorter sleep duration also triggers changing in glucose metabolism that could cause insulin resistance29. BMI >25 kg/m² as the marker of over-nutrition was found as dominant factor related to metabolic syndrome. Obesity condition marked by higher fat mass mainly affecting the secretion of free radicals including IL-6, TNF-α and MCP-1 then worsen the inflammatory condition and causes metabolic syndrome.

Conclusions

BMI >25 kg/m² was found as dominant factor related to metabolic syndrome. Maintain BMI in normal range is crucial to prevent the occurrence of metabolic syndrome.

Conflict of Interest: The authors declare that there is no conflict of interest.

Source of Funding: Self funded
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8. Griesemer RL. Index of central obesity as a parameter to evaluate metabolic syndrome for white, black, and hispanic adults in the United States. Thesis. Graduate Faculty of Georgia State University, Atlanta.


Development of Holistic Nursing Care Model for Mental Disorder Patients Care in Indonesia

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Abstract

Background: Holistic care is a comprehensive model of caring. It has been known as bio-psycho-socio-cultural approach.

Objective: This study aims to develop a holistic nursing care model for mental disorder patients in Indonesia.

Method: This study using explanatory design with cross sectional approach. The participants are nurse in mental health hospital in one province in Indonesia. The sample size is 120 nurses. Data were collected using questionnaire then analyzed using Partial Least Square.

Results: Comprehensive modality therapy (path coefficient=0.621; t=11.75), written standard operational procedures for modality therapy (path coefficient=0.749; t=4.107), nurse competency (path coefficient=0.838; t=30.341), hospital policy (path coefficient=0.567; t=10.736), hospital facilities (path coefficient=0.861; t=23.028), community and family engagement (path coefficient=0.797; t=14.252), and cross-sector collaboration (path coefficient=0.756; t=11.326), influenced the implementation of holistic nursing care in treating mental disorder patients.

Discussion: The holistic nursing care model in treating mental disorder patients not only bio-psycho-socio-spiritual approach but also depend on supportive healthcare facility, policy and community.

Keyword: holistic, nursing care, mental disorder

Introduction

Mental disorder is a behavioral syndrome associated with symptoms of suffering, limitations, and inability to perform essential human functions (1,2). Indonesian basic health research which conducted in 2013 shows that 1.7/1000 of Indonesia’s population has severe mental disorder, with 14.3% experienced restrained in home (3). Six out of 100 Indonesians suffer from emotional mental disorders, resulting in poor productivity and quality of life. Mental health nursing goals is to improve and maintain the patient’s adaptive behavior to contribute to their integration function.

Various therapeutic alternatives intervention in treating mental disorder patients has been developed: psychopharmacology drug, electroconvulsive therapy, cognitive and behavioral therapy, group activity therapy, family therapy and psychiatric rehabilitation. Indonesian government roadmap about “Indonesia free restrain” by 2014 has been socialized since 2010. In fact, the case finding of mental disorder patients who are being restrained in home continues to increase. The Indonesian Ministry of Health data showed the case finding of mental disorder patients who are being restrained in 2010 was 383, in 2011 was 1139, and data from January to August 2012 was 803.

Holistic care is a comprehensive care that aim to meet the patient’s physical, mental, social and emotional needs (4,5).

Caring for mental disorder person will cause productivity loss of family member who become their caregiver. That condition will lead to economic potential lost due to mental disorder. The potential economic lost
due to severe mental disorder is equivalent to the number of patients times by regional minimum wage (58,520 people x 2,2 million) around IDR 128,744,000,000 cost.

Preliminary study shows that mental disorders not only a patient problem, but also family, community, health care, including nurses. Nurses should have the competence such as delivering nursing care, implementing standard operational procedures, and conducting modality therapy in caring for mental disorders patients. A number of barriers in giving care for mental disorder patients in hospital include: incompleteness of nursing care documentation, limited service facilities, ineffective of management implementation in the ward, lack of human resources in nurses (quantity and competence), workload (5) and the condition of patients treated (6). Problems concerned to family and community include: family perception that one family member had mental disorder, caring for family member mental disorder, family feeling, stigma from family and community, perceived impact, and family expectation. It is necessary to formulate a holistic model of mental health nursing. Holistic service is a design of a comprehensive model of health care in view of the various healthy responses of illness by taking into account all components such as biological, psychological, social, cultural and even spiritual (7).

The holistic model will involve the contribution of all elements include patient, family, community and health care providers especially nurses. So this study aims to develop a holistic model in giving care of mental disorders patients.

Materials and Method

Study Design

This study uses explanatory method. The population of the study was nurses at mental hospital Menur Surabaya and mental hospital Lawang Malang. The sample was 120 respondents obtained through simple random sampling technique.

Measures

The data quantified using questionnaires that developed based on previous result of our study. The questionnaire is consist of 55 questions dividing in 8 categories that reflect the study variables: the implementation of holistic nursing care, the implementation of modality therapy, standard operational procedures, human resources nursing, hospital policy, hospital facilities, community condition, and cross-sector role. Each questions is rated on four-point of likert scale (always, sometimes, rarely and never).

Data collection

Respondents were completed the study questionnaire individually after obtaining an explanation of the purpose, benefits, rights and responsibilities of the respondent, and provided the inform consent to follow the study. The respondents fill out questionnaires data characteristics of respondents include gender, age, employment, place (unit) work, and level of education and questionnaire research variables. The collected data is then tabulated for analysis.

Data Analysis

The data were analyzed using partial least square variance-based structural equation modeling (PLS-SEM) in order to model for simultaneous relationships among multiple constructs.

Findings

Characteristics of Respondents

Characteristics of respondents based on the results of the description presented in table 1 in the form of frequency and percentage values. The data show that the majority of respondents are at productive age (36-40 years old) with year of services in 11-15 years. Respondents mostly work in in-patient ward and some have educational backgrounds as Nursing and Nursing Diploma 3.

Model test results Analysis of research variables

The holistic nursing care model test in caring for mental disorders patients begins by evaluating the relationship of latent variables with the study variables through validity and reliability tests. Table 3 describes valid latent variables in forming research variables. Reliability of latent variable is shown with composite value of reliability >0.7. While variable validity is indicated by measuring convergent validity and discriminant validity. Convergent validity was achieved after the research variables obtained the average value of extracted (AVE) >0.5.
Structural model analysis

Structural test of holistic model is used to test the research hypothesis. The results of the holistic model structuring test in treating psychiatric patients were performed on valid and reliable research variables. Based on the results of the structural model test as can be seen in table 5 that the modality therapy is built significantly by 3 research variables, namely modal therapy, hospital policy and community situation. The three variables each have a positive relationship, in the sense that the better the nurse modality therapy, the more supportive of hospital policies and the more supportive of the community situation then the application of holistic models in mental patients will be better. These three variables together determine the implementation of the holistic model in treating psychiatric patients by 40.5%, and the rest is influenced by other variables that are not examined.

Table 1 Respondent Characteristic (n=100)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>58 (48.3)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>62 (51.7)</td>
</tr>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 – 25</td>
<td></td>
<td>5 (4.1)</td>
</tr>
<tr>
<td>26 – 30</td>
<td></td>
<td>19 (15.8)</td>
</tr>
<tr>
<td>31 – 35</td>
<td></td>
<td>18 (15.0)</td>
</tr>
<tr>
<td>36 – 40</td>
<td></td>
<td>24 (20.0)</td>
</tr>
<tr>
<td>41 – 45</td>
<td></td>
<td>16 (13.3)</td>
</tr>
<tr>
<td>46 – 50</td>
<td></td>
<td>23 (19.1)</td>
</tr>
<tr>
<td>51 – 55</td>
<td></td>
<td>14 (11.6)</td>
</tr>
<tr>
<td>56 – 60</td>
<td></td>
<td>1 (0.8)</td>
</tr>
<tr>
<td>Work Tenure (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – 5</td>
<td></td>
<td>14 (11.7)</td>
</tr>
<tr>
<td>6 – 10</td>
<td></td>
<td>22 (18.3)</td>
</tr>
<tr>
<td>11 – 15</td>
<td></td>
<td>25 (20.8)</td>
</tr>
<tr>
<td>16 – 20</td>
<td></td>
<td>15 (12.5)</td>
</tr>
<tr>
<td>21 – 25</td>
<td></td>
<td>13 (10.8)</td>
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<tr>
<td>26 – 30</td>
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<td>19 (15.9)</td>
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<tr>
<td>31 – 35</td>
<td></td>
<td>8 (6.7)</td>
</tr>
<tr>
<td>36 – 40</td>
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</tr>
<tr>
<td>Missing</td>
<td></td>
<td>3 (2.5)</td>
</tr>
<tr>
<td>Workplace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workplace</td>
<td>Inpatients room</td>
<td>89 (74.2)</td>
</tr>
<tr>
<td>Workplace</td>
<td>Outpatients</td>
<td>31 (25.8)</td>
</tr>
<tr>
<td>Latest Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latest Education</td>
<td>D3 (3-year diploma)</td>
<td>55 (45.8)</td>
</tr>
<tr>
<td>Latest Education</td>
<td>D4 (4-year diploma)</td>
<td>15 (12.5)</td>
</tr>
<tr>
<td>Latest Education</td>
<td>S1 (Undergraduate)</td>
<td>49 (40.9)</td>
</tr>
<tr>
<td>Latest Education</td>
<td>Magister of health</td>
<td>1 (0.8)</td>
</tr>
</tbody>
</table>
### Table 2  $\rho_A$ test

|                          | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics ($|O/\text{STDEV}|$) | P Values |
|--------------------------|---------------------|-----------------|----------------------------|---------------------------------|----------|
| Nursing intervention     | 0.621               | 0.629           | 0.053                      | 11.754                          | 0.000    |
| Hospital policy          | 0.567               | 0.574           | 0.053                      | 10.736                          | 0.000    |
| Community                | 0.797               | 0.799           | 0.056                      | 14.252                          | 0.000    |
| Modality therapy         | 0.824               | 0.818           | 0.074                      | 11.169                          | 0.000    |
| Hospital facility        | 0.861               | 0.874           | 0.037                      | 23.028                          | 0.000    |
| Human resource for nursing | 0.838             | 0.843           | 0.028                      | 30.341                          | 0.000    |
| Standard operational procedure for modality therapy | 0.749 | 0.792 | 0.182 | 4.107 | 0.000 |
| Cross-sector collaboration | 0.756            | 0.781           | 0.067                      | 11.326                          | 0.000    |

### Table 3 Composite Reliability Test

|                          | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics ($|O/\text{STDEV}|$) | P Values |
|--------------------------|---------------------|-----------------|----------------------------|---------------------------------|----------|
| Nursing intervention     | 0.749               | 0.742           | 0.031                      | 24.087                          | 0.000    |
| Hospital policy          | 0.730               | 0.727           | 0.022                      | 32.485                          | 0.000    |
| Community                | 0.841               | 0.838           | 0.022                      | 37.569                          | 0.000    |
| Modality therapy         | 0.849               | 0.841           | 0.018                      | 48.066                          | 0.000    |
| Hospital facility        | 0.869               | 0.861           | 0.018                      | 48.694                          | 0.000    |
| Human resource for nursing | 0.853             | 0.852           | 0.015                      | 56.701                          | 0.000    |
| Standard operational procedure for modality therapy | 0.829 | 0.825 | 0.023 | 36.759 | 0.000 |
| Cross-sector collaboration | 0.886            | 0.884           | 0.018                      | 48.153                          | 0.000    |

**Discussion**

This study shows that holistic model in treating psychiatric patients was shaped significantly by the implementation of nursing modality therapy, hospital policy and the situation in the community which in line with previous study (8-11) that the holistic approach consists of two aspects: the patient and the multidimensional which becomes complicated by the patient’s pain situation. The holistic model focuses on the health conditions of psychiatric patients and attempts to the outside aspects of the patient’s system, the hospitals and the community.

Mental health hospital should have supportive policy towards modality therapy implementation for mental disorder patients. The holistic model pays attention to the community’s response and community engagement
to mental disorder patients when back to their home. Mental hospital should develop community-based interventions, family-based interventions, preparing the community readiness to caring for mental illness patients to warrant the continuity of modality therapy implementation.

The results of the study show that the mental health nursing holistic model is applied by performing integrated nursing care starting from the assessment especially in the spiritual aspect, making the diagnosis based on 10 major nursing problems, bio-psycho-spiritual-social problem and individual-based intervention, and implementing intervention based on Standard operational procedure. This model is in line with previous study (12) that stating that holistic nurses will provide care to a patient thoroughly covering the process of assessment, determination of diagnosis, formulating goals and treatment plans, intervening and evaluating. Previous study shows that a holistic nursing approach raises demands for nurses to interact with patients well so as to determine the health status of patients and determine appropriate actions to improve health (11). So the approach of nursing care is an appropriate method in compiling a holistic nursing care model development in caring for mental disorders patients.

Spiritual aspect need to be assess by nurses during hospitalization. Hospital should facilitate the patients spiritual fullfillness, spiritual consultants and the patient’s expectation of his illness (13). Currently the nursing care given to the patient still focuses on the biological, psychological and social aspects, so that the addition to the spiritual aspect will complement the nursing approach in the holistic model of nursing.

Modality therapy is one component of the application of holistic models in treating psychiatric patients. Modality therapy has a varied approach to mental disorder including somatic therapy, psychological therapy, environmental therapy, community therapy and activity therapy (14) and aims to change maladaptive behavior to be more adaptive. Nurses should pay attention to patient characteristics and disease conditions in providing modality therapy, so that the patient is willing and able to follow the therapeutic process.

The holistic model integrates the biological, psychological, social and spiritual aspects in caring for mental illness patients. The biological aspect is manifested in the medication which will help mental patients achieve improved mental functioning (14). Medication intervention should be accompanied by psychological intervention. Psychological therapy focuses on the use of both verbal and non-verbal communication, improving the thought process and helping the patient understand all about mental disorder (15,16). Psychological therapy is delivered simultaneously with social therapy (World Health Organization, 2005).

The holistic model use individual therapy, cognitive therapy, behavioral therapy, psychosocial therapy and group activity therapy to train patients independently. During the treatment process the nurse pays attention to the patient’s verbal and non-verbal responses, with clear outcome. The holistic model adds spiritual therapy as an important part in the application of modality therapy by helping patients to recognize their ability to deal with illness, especially with regard to motivation, positive attitude and optimism (13).

The key of modality therapy is a good therapeutic patient-nurse relationship (17). The relationship should be established so nurses can select the right modality therapy which can help the patient to achieve better outcome.

Hospital policy is the second component that needed to apply holistic model to ensure patients receive holistic services. The results showed that hospital policy related to job description, authority, remuneration, and reward is needed to implement mental health holistic model. Job descriptions are information that describes job standards and task lists to be done in relation to a person’s position in a particular job (18) which relate to the authority in perform an action. Nurses working in health institutions according to Indonesian Law No. 23 of 1992 on health that state that the ability and authority to perform nursing care is based on their education level. The authority of the nurse is the right and autonomy to perform nursing care based on the ability, level of education, and the position held.

Mental health nurses in Indonesia have multiple job including structural position that obstruct to fully carry out the main task of carrying out treatment to the patient. The findings of this study are consistent with Fisher’s (2011) opinion that patient-nurse rasio is high which cause incomplete documentation and could not carry out intensive psychological intervention. The results show
that remuneration and reward systems are an important aspect of hospital policy when implementing holistic model. Inappropriate reward that nurses get will affect the intervention implementation. The holistic model in this study requires a clear policy about job descriptions and authorities and appropriate remuneration and reward systems.

Community is important aspect in applying holistic model in caring for mental illness patients. The results of this study indicate the existence of elements of community empowerment in the mental health nursing holistic model. Patients with mental illness after hospitalization will return to their families and communities, thus requiring favorable circumstances to avoid recurrence. Nevertheless it is well known that the stigma of society is still high on the existence of patients Schizophrenia, so it takes an intensive approach so that people begin to receive and support the patient’s existence in family and society. The stigma that developed in the community is caused by the lack of understanding related to mental disorders, the impact and the way of treatment (19).

The application of holistic models requires a special strategy to manage the stigma in the community. So that the nursing holistic model that has been applied since the patient is hospitalized can be continued with good community acceptance, even the community to support the use of health service facility, will be able to decrease the recurrence rate.

**Conclusion**

The holistic model in caring for mental disorders patients using nursing care approach of the soul which in its implementation pay attention to the patient from biological, psychological, social and spiritual aspects. The holistic model is carried out by applying the treatment of soul-nursing modalities supported by the hospital policy and the existence of a conducive community situation.

**Onflict of Interest:** There is no actual or perceived conflict interest during this study conduct.

**Source of Funding:** This study is supported by a grant from Ministry of Research, Technology & Higher Education Indonesia.

**Ethical Clearance:** This study has been approved for ethical clearance from lawang mental Health Hospital and Menur Mental Health Hospital.

**References**

14. Srevani. A guide to mental health and psychiatric


Benefits of Standard Therapy with Nasal Irrigation Using NACL 0.9% on Chronic Rhinosinusitis Patients without Polyp

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¹Department of ear, Nose, Throat, Head-Neck Surgery, Medical Faculty, Hasanuddin University, Indonesia, ²Department of Biostatistic, Public Health Faculty, Hasanuddin University, Indonesia

Abstract

Background: Chronic rhinosinusitis is a clinical problem that has a serious impact on patient quality of life. This study was aimed to observe the effect of nasal irrigation therapy with 0.9% NaCl on improving CT-scan and quality of life of chronic rhinosinusitis without polyp.

Materials and Method: It was a prospective cohort study of 24 adult patients. Divided into 2 groups with standard therapy with nasal irrigation and without nasal irrigation. The results were assessed based on a CT-scan imaging with Lund Mackay score and quality of life with SNOT-20 before and after therapy.

Results: There were significant improvements in CT scans (p = 0.002), and quality of life after standard therapy with 6 weeks once daily nasal irrigation, but no significant change in CT scores (p = 0.552) in the group after standard therapy without nasal irrigation.

Conclusion: standard therapy and once-daily nasal irrigation give better outcome for chronic rhinosinusitis without polyp before considering surgical intervention.

Keywords: Nasal irrigation, Lund Mackay score, SNOT-20.

Introduction

Rhinosinusitis is an inflammatory disease of nasal mucosa and paranasal sinus usually caused by viral, bacterial, fungal, dental infection, or due to fractures and tumors. If this rhinosinusitis continues with a period of symptoms of ≥12 weeks characterized by two or more symptoms, one of which is a nasal congestion / obstruction / congestion or nasal secretion (anterior, posterior nasal drip) is referred as chronic rhinosinusitis (CRS).¹,²

The current prevalence of CRS has reached 13.4 to 25 million cases. According to the National Ambulatory Medical Care Survey in the United States in 2001 there were 12.3 million visits to health care each year due to CRS. While in Indonesia precisely at the Cipto Mangunkusumo Hospital (RSCM) has been reported that the incidence of new cases of rhinosinusitis in adult patients who come to the Rhinology Division of Department of ENT in January to August 2005 as many as 435 patients and 300 patients of which suffered rhinosinusitis. In addition, from three teaching hospitals in Makassar City from 2003 to 2007, 4.5% of cases of rhinosinusitis from all cases treated by the Rhinology Department¹,³,⁴,⁵

Furthermore, in the diagnosis of CRS, the symptoms is one of the important things and imaging studies such as CT scan is the gold standard. Some cases of chronic rhinosinusitis generally have to end with surgery. Therefore, proper diagnosis and management is necessary to prevent the severity of CRS. According to the CRS management guidelines recommended use of antibiotics, topical steroids and nasal wash with physiological NaCl solution.²,⁶

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One that has been known empirically and widely applied to CRS patients in the clinic is irrigation or nasal wash which generally use isotonic saline solution, this nasal washing is believed to be able to relieve symptoms of rhinosinusitis. Wei JL et al 2011, intranasal irrigation with saline or saline + gentamycin is safe and effective in the treatment of chronic rhinosinusitis in pediatrics on CT scan based on Lund Mackay and quality of life. This study aims to examine the effect of standard therapy with nasal irrigation with 0.9% NaCl on improvement of CT-scan score based Lund Mackay (LMK) scoring system and quality of life based on SNOT-20 in chronic rhinosinusitis without polyps patients.

**Materials and method**

**Research site**

This research was conducted in the outpatient unit of ENT department Dr. Wahidin Sudirohusodo Hospital Makassar starting from December 2017 until March 2018.

**Design and research variables**

The design of this study is experimental cohort study. The independent variable in this study was patient with chronic rhinosinusitis without polyp, while the dependent variable was improved symptoms, CT scan and improvement of quality of life after 6 weeks.

**Samples**

The sampling technique was performed randomly. In this study all patients who have been diagnosed as chronic rhinosinusitis based on the history, the ENT diagnostic examination were undergone CT scan of paranasal sinus coronal view and record quality of life by SNOT 20. The sample size is 24 patients were devided into 2 groups. Patients in the first group (12 patients) received standard therapy for 3 weeks and adjuvant therapy once daily nasal irrigation with NaCl 0.9% for 6 weeks, while the second groups received only standard therapy without nasal irrigation. After 6 weeks, Patients from both groups were examined for CT scan of paranasal sinus coronal view and quality of life by SNOT 20.

**Research Ethics Aspect**

The study permit was obtained from Biomedical Research Ethics Committee on Human Faculty of Medicine Universitas Hasanuddin (Register No. 1030/H4.8.4.5.31/PP36-KOMETIK/2017).

**Exclusion criteria**

Patients with sinonasal tumors, nasal polyps, severe septal deviation, septal perforation, maxillofacial fracture, rhinosinusitis with orbital complications, pregnancy and lactation, and patients with a history of Endoscopic sinus surgery.

**Drugs**

The drug that we used is standard therapy cefadroxyl 2x500mg oral, methylprednisolon 2x4mg oral, and tremenza 2x1 oral for (3 weeks) and nasal irrigation is 20 ml NaCl 0.9% each nasal cavity once daily for 6 weeks.

**Statistical Analysis**

Data were analyzed using Statistical Package for Social Sciences (SPSS) software (version 21.0 for Windows; SPSS Inc, Chicago, IL).

**Findings**

**Table 1: Symptoms in both groups of chronic Rhinosinusitis without polyps**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>41.67</td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>58.33</td>
</tr>
<tr>
<td>Age (mean)</td>
<td></td>
<td>31.44</td>
</tr>
<tr>
<td>20-30</td>
<td>10</td>
<td>41.67</td>
</tr>
<tr>
<td>31-40</td>
<td>14</td>
<td>58.33</td>
</tr>
<tr>
<td>Symptom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasal obstruction</td>
<td>7</td>
<td>29.2</td>
</tr>
<tr>
<td>Post Nasal Drips</td>
<td>7</td>
<td>29.2</td>
</tr>
<tr>
<td>Rhinorrhea</td>
<td>10</td>
<td>41.6</td>
</tr>
</tbody>
</table>

From the 24 samples in this study, 10 samples (41.67%) were male, and 14 samples (58.33%) were female. With age group 20-30 years as many as 10 samples (41.67%), and age group 31-40 counted 14 sample (58.33%) with mean age 31.44 years. Most (41.6%) of patient have symptom rhinorrhea, following nasal obstruction (29.2%) and post nasal drips (29.2%).
Table 2: Characteristic of patients with chronic Rhinosinusitis without polyps before and after intervention

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>LMK</td>
<td>24</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>SNOT 20</td>
<td>24</td>
<td>21</td>
<td>78</td>
</tr>
</tbody>
</table>

The total number of Lund Mackay (LMK) score before therapy appears to be a maximum total score of 22, and a minimum total score of 3, with a mean rank of 7.5. And total score of Lund Mackay after therapy maximum 21 and minimum score 1 with mean rank 4.5.

While the total number of SNOT-20 score before treatment was obtained at a maximum of 78 and a minimum of 21 with mean rank of 44.5, and for after treatment the total score of SNOT-20 was maximum 71 and minimum 7 with mean rank 21.

Fig.1: (a) CT scan of paranasal sinus coronal view in our patients 26 years old before nasal irrigation (b) CT scan sinus paranasal coronal view in the same patient after 6 weeks nasal irrigation.

Picture 1 shows a CT scan of the coronal sinus paranasal section in our 26-year-old patient with chronic rhinosinusitis prior to standard therapy and nasal irrigation, and the next images show improvement and resolution of sinus mucosa thickening and patency of Ostiomeatal complex after standard therapy with nasal irrigation.

Table 3: Changes in Lund Mackay CT Scan scores and quality of life based on SNOT-20 in patients with chronic Rhinosinusitis without polyps before and after standard therapy and nasal irrigation with NaCL 0.9% 6 weeks

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
<th>Pretest</th>
<th>Posttest</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Mean)</td>
<td>(Mean)</td>
<td></td>
</tr>
<tr>
<td>LMK</td>
<td></td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>Negative rank</td>
<td>12 (100.0)</td>
<td>7.75</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Positive rank</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SNOT 20</td>
<td></td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>Negative rank</td>
<td>12(100.0)</td>
<td>48.25</td>
<td>22.58</td>
<td></td>
</tr>
<tr>
<td>Positive rank</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*Wilcoxon Signed Ranks Test significantly difference (p<0.05), not significantly changes (p>0.05)
Table 3 shown that all (100%) of patients ware negative rank. Mean (7.75) of CT scans with Lund Mackay score at pretest to be lower (3.8) at posttest. Wilcoxon Signed ranks test shown that there was a significant improvement of rhinosinusitis before and after standard therapy with nasal irrigation among patients (p=0.002).

Table 3 also showed that all (100%) of patients have improving quality of life before and after intervention. Mean (48.25) of SNOT-20 at pretest to be lower (22.58) at posttest, with Wilcoxon test shown that there was a significant change quality of life before and after intervention (p=0.002).

Table 4: Changes in Lund Mackay score and quality of life based on SNOT 20 in patients with chronic Rhinosinusitis without polyps before and after standard therapy without nasal irrigation

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
<th>Pretest (Mean)</th>
<th>Posttest (Mean)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMK</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative rank</td>
<td>4 (33.3)</td>
<td>14</td>
<td>12</td>
<td>0.552</td>
</tr>
<tr>
<td>Positive rank</td>
<td>3 (25.0)</td>
<td>5.3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>5 (41.7)</td>
<td>7.6</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>SNOT 20</td>
<td></td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>Negative rank</td>
<td>12 (100.0)</td>
<td>40.33</td>
<td>31.67</td>
<td></td>
</tr>
<tr>
<td>Positive rank</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*Wilcoxon Signed Ranks Test

Table 4. shown that 33.3% of sample had negative rank or having mean (14) of CT scans with Lund Mackay score at pretest to be lower (12) at posttest. 25.0% of sample had positive rank or having mean (5.3) at pretest to be higher (10) at posttest, and 41.7% of sample had ties rank or there was no change of mean at before (7.6) and after (7.6) of therapy standard intervention. Wilcoxon Signed ranks test shown that there was no significant change of disease before and after standard therapy.

For the quality of life the total score of SNOT-20 shown 100% of samples were improved their quality of life after standard therapy. Wilcoxon Signed Rank Test results shown that there was a significant change quality of life before and after standard therapy intervention (0.002).

**Discussion**

In this study, the characteristics of the sample showed similar distributions between male and female sexes. The incidence rate in chronic rhinosinusitis by sex is found to be the same or slightly more in males. However, in this study there were 14 samples (58.33%) of women, and 10 samples (41.67%) were male. This is consistent with another study where the incidence of chronic rhinosinusitis two times more in women than in men.9,10

Age distribution showed that sample age was varied, most of them in 31-40 age group as many as 14 samples (58.33%), and age group 20-30 years 10 samples (41.67%), with mean age of sample 31.45 year. This suggests that chronic rhinosinusitis is more common in young adulthood. This is as reported by Privina Arivalagan, (2013) incidence of chronic rhinosinusitis that occurred in RSUP Haji Adam Malik in 2011 most often in the 31-45 year age range. Characteristics of the sample according to the symptoms in this study were Rhinorrhea (41.7%), Post Nasal Drips and Nasal Obstruction 29.2% respectively.11

In our study, the Lund Mackay Score in Patients with Chronic Rhinosinusitis without polyps Improved in all samples (100%) After Standard Therapy + Nasal Irrigation With Nacl 0.9% once daily for 6 Weeks, with significant changes in Lund Mackay score of 0.002 (p
<0.05). This result is in line with the previous study that the daily use of nasal irrigation for 6 weeks is very effective and safe as chronic rhinosinusitis therapy in children where from the CT scan can be seen a reduction in sinus mucosal thickening and correlated with reduced complaints. In another study, a Lund Mackay score of 4.14 and 4.38 on the left and right sinuses, p <0.001 after nasal irrigation with isotonic saline once daily for 6 weeks in chronic rhinosinusitis children with 65, 9% reported complete resolution and only 12.1% requiring surgical treatment (Wei JL, et al, 2011; Pham Vinh, et al, 2014). It has also been described that nasal irrigation enhances mucociliary function, which reduces usdm and reduces the amount of chemical mediator accumulation, mechanically cleans mucus, provides a mild vasoconstrictive effect that reduces congestion complaints, and nasal irrigation also restores aeration in the sinus, thereby decreasing the progression of excess bacteria. Therefore, nasal irrigation may be recommended as first-line adjuvant therapy in chronic rhinosinusitis without polyps before considering surgical therapy.

This study also showed that quality of life based on SNOT 20 in chronic rhinosinusitis patients without polyps had significant improvement in all samples (100%) after standard with nasal irrigation therapy once daily for 6 weeks with a value of 0.002 (p <0.05). This result is in line with the previous study that the daily use of nasal irrigation provides improved quality of life after 6 weeks. Another study concluded that in cases of allergic rhinitis, salin use improved nasal symptom improvement by 27.6%, reduced drug use by 62.1% and improved quality of life by 27.8%.8,12

In the control group, the change in lund mackay score and quality of life based on SNOT-20 in chronic rhinosinusitis patients without polyps after standard therapy without nasal irrigation once daily for 6 weeks, only 4 (33.33%) samples from 12 samples improved Lund Mackay score, 5 samples (41.66%) unchanged, and 3 samples (25%) experienced worsening Lund Mackay score after standard therapy without nasal irrigation. This shows no significant change in Lund Mackay’s total score on CT scan of patients with chronic rhinosinusitis without polyps.

While the quality of life measured by the total number of SNOT 20 score can be seen that there is a change in SNOT 20 score to be better after the use of standard therapy without additional nasal irrigation in chronic rhinosinusitis without polyps patients, where Wilcoxon Signed Rank Test results showed significant figures 0.002 (p <0.05). The effectiveness of medical therapy on chronic rhinosinusitis in improving complaints and quality of life to 40%.

The limitations of this study are the limited number of samples requiring further study with more samples, patient adherence to both standard medical therapy and nasal irrigation with saline not measured, and not being accurate about how much irrigation is required and at what speed / effective irrigation power.

Conclusions

Management of chronic rhinosinusitis without polyp with standard therapy and nasal irrigation NaCl 0.9% once daily for 6 weeks gave a much better result of a review of the results of Lund Mackay CT scan score and quality of life based on SNOT-20, compared with standard therapy without nasal irrigation.

Once-a-day nasal irrigation may be the first line of additional therapy for chronic rhinosinusitis without polyps thus improving the quality of life before considering surgical intervention.

Conflict of Interest : There is no conflict of interest

Source of Funding: Researcher (Self)

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Child Health Care Practices and Stunting in Children Aged 12-36 Months in Jember Regency of Indonesia

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Abstract

Stunting is a major nutritional problem in children under five that occurs in developing countries. Child health care practices by good parents can prevent stunting in children from an early age. Child health care practices include immunization, sick child care, hand washing, clean water supply and drinking water, and sanitation. The purpose of this study is to analyze the effects of child health care practices on stunting in children aged 12-36 months in Jember Regency, Indonesia. This research was an observational analytic study using case-control design. The population of the study were the mothers with children aged 12-36 months in the sub-districts of Arjasa and Kencong in Jember Regency. The sample were selected using simple random sampling technique, totaling of 220 mothers. The data were analyzed using chi-square statistic tests and multiple logistic regression tests. The results of tests discovered that most of the subjects were poorly educated and as housewives. The significant determinants associated with stunting were completeness of basic immunization, water supply and drinking water, and sanitation (p < .05). Thus, we can conclude that there was a significant effect of child health care practices on stunting in children under five. It should be further investigated about the influence of socio-cultural factors that affect child health care practices.

Keywords: stunting; child health care practices; drinking water; immunization; sanitation

Introduction

Stunting is a major nutritional problem in children under five especially in the developing countries. World Health Statistics data in 2014 shows that one of four children aged less than five years worldwide experience stunting. More than 178 million stunting children are in developing countries and 99% in the region of Southeast Asia and Africa¹².

Stunting can be caused by malnutrition that occurs early from the development of the fetus to two-year-old child. Stunting children tend to have low cognitive development, chronic diseases, infectious diseases, low productivity, and adversely affect social, economic outcomes and increase the risk of future child mortality¹⁴.

Indonesia is at the fifth position of the countries that have the highest stunting prevalence. Based on the results of Basic Health Research, stunting prevalence in Indonesia is 36.8%, 35.6% and 37.2% in 2007, 2010 and 2013 respectively³. East Java Province is a reflection in the achievement of child health outcomes in Indonesia. The prevalence of stunting in East Java has remained stagnant over the last three years of 27.0%, 26.1%, 26.9% in 2015, 2016, and 2017. This means that East Java has not met the national target of 26.2%⁶.

Child health care is one of the determinants of stunting. Good health care practices by parents with attention to child’s condition, completeness of basic immunization, hand washing, environmental hygiene and caring for children during illness may prevent stunting in infants⁷. Children who are not immunized are three times more likely to have stunting⁸. Unsuitable laundry practices by mothers increase the risk of stunting 2.89 times greater. Mothers who are able to care for children better, their children have less risk of illness and malnutrition⁹. Poor water sources, drinking water, and
sanitation also increase the risk of children becoming stunting\(^{10}\).

Jember Regency is at the second position of the districts with the highest stunting prevalence in East Java (39.3\%)\(^{11}\). Therefore, Jember Regency has become one of the stunting priority districts in East Java. Arjasa and Kencong sub-districts of Jember Regency are the highest prevalence stunting areas (39.30\% and 38.78\%)\(^{12}\). The objective of this study is to analyze the effects of child health care practices on stunting in children aged 12-36 months in Jember Regency, Indonesia.

**Materials and Method**

This research was an observational analytic study with case-control design. The study was conducted in Arjasa and Kencong sub-districts of Jember Regency in March till April 2018. A simple random sampling was used to select the sample of 220 mothers with children aged 12-36 months (110 stunting children as a case group and 110 non stunting children as a control group).

The data of immunization completeness was obtained from the attachment of Maternal and Child Health (MCH) book Data on child health care, handwashing practice, clean water sources, drinking water and sanitation were obtained from structured interviews with questionnaires and observations. All of the questionnaires were calculated by the validity and reliability test.

In order to examine the effect of health care practice (completeness of basic immunization, child health care, handwashing practice, source of water, sanitation) to stunting, the data were submitted to the bivariate analysis with chi-square and multivariate analysis with multiple logistic regression with 95\% confidence interval and significance level \(p < 0.05\).

**Findings**

**Table 1. Characteristic of Respondents**

| Characteristics                        | Stunting | Normal | Total (n,%)
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>66</td>
<td>60.0</td>
<td>54</td>
</tr>
<tr>
<td>Female</td>
<td>44</td>
<td>40.0</td>
<td>56</td>
</tr>
<tr>
<td>Mother’s Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-25</td>
<td>27</td>
<td>24.5</td>
<td>35</td>
</tr>
<tr>
<td>26-35</td>
<td>56</td>
<td>60.0</td>
<td>51</td>
</tr>
<tr>
<td>36-46</td>
<td>27</td>
<td>24.5</td>
<td>20</td>
</tr>
<tr>
<td>47-55</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Mother’s Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Education</td>
<td>66</td>
<td>60.0</td>
<td>73</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>34</td>
<td>30.9</td>
<td>32</td>
</tr>
<tr>
<td>Tertiary Education</td>
<td>10</td>
<td>9.1</td>
<td>5</td>
</tr>
<tr>
<td>Mother’s Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>82</td>
<td>74.5</td>
<td>77</td>
</tr>
<tr>
<td>Others</td>
<td>28</td>
<td>25.5</td>
<td>33</td>
</tr>
<tr>
<td>Father’s Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Farmer/Fisherman/Unskilled Worker/Carpenter</td>
<td>52</td>
<td>47.3</td>
<td>38</td>
</tr>
<tr>
<td>Public Servants/Policeman/Army</td>
<td>8</td>
<td>7.3</td>
<td>5</td>
</tr>
<tr>
<td>Private Servants</td>
<td>8</td>
<td>7.3</td>
<td>20</td>
</tr>
<tr>
<td>Freelance</td>
<td>42</td>
<td>38.2</td>
<td>44</td>
</tr>
<tr>
<td>Number of Family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 4 persons</td>
<td>88</td>
<td>80.0</td>
<td>82</td>
</tr>
<tr>
<td>&gt; 4 persons</td>
<td>22</td>
<td>20.0</td>
<td>28</td>
</tr>
</tbody>
</table>

*Table 1* shows that most of the stunting children were male (60.0\%) while most of the non-stunting children were female (50.9\%). Maternal age in stunting and non-stunting children was mostly between 26-35 years (48.6\%). Most mothers of children (63.2\%) had a low education (elementary schools and junior high schools). Most of them (73.2\%) were housewives while most of the fathers were unskilled workers (40.9\%). Most of the number of family members in a single home was less than 4 persons.
Table 2. Summary of bivariabel analyses of the investigated variables for stunting

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Stunting</th>
<th>Normal</th>
<th>Total</th>
<th>p</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic immunization</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Incomplete</td>
<td>10 9,1</td>
<td>2 1,8</td>
<td>12(5,5)</td>
<td>0,000</td>
<td>0,226</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0,112 – 0,452)</td>
</tr>
<tr>
<td>Complete</td>
<td>100 90,9</td>
<td>108 98,2</td>
<td>208(94,5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child health care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>61 55,5</td>
<td>37 33,6</td>
<td>98(44,5)</td>
<td>0,000</td>
<td>0,674</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0,388 – 1,171)</td>
</tr>
<tr>
<td>Good</td>
<td>49 44,5</td>
<td>73 66,4</td>
<td>122(55,5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand washing practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>85 77,3</td>
<td>76 69,1</td>
<td>161(73,2)</td>
<td>0,000</td>
<td>0,657</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>(0,360 – 1,200)</td>
</tr>
<tr>
<td>Good</td>
<td>25 22,7</td>
<td>34 30,9</td>
<td>59(26,8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>21 19,1</td>
<td>14 12,7</td>
<td>35(15,9)</td>
<td>0,002</td>
<td>1,210</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0,704-2,078)</td>
</tr>
<tr>
<td>Good</td>
<td>89 80,9</td>
<td>96 87,3</td>
<td>185(84,1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>54 49,1</td>
<td>28 25,5</td>
<td>82(37,3)</td>
<td>0,000</td>
<td>0,354</td>
</tr>
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<td></td>
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<td></td>
<td></td>
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<td>(0,200 – 0,626)</td>
</tr>
<tr>
<td>Good</td>
<td>56 50,9</td>
<td>82 74,5</td>
<td>138(62,7)</td>
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</table>

Table 3. Summary of multiple logistic regression

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Stunting</th>
<th>Normal</th>
<th>Total</th>
<th>B</th>
<th>SE</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
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<tr>
<td>Basic immunization</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Incomplete</td>
<td>10 9,1</td>
<td>2 1,8</td>
<td>12(5,5)</td>
<td>0,260</td>
<td>0,380</td>
<td>0,000</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>100 90,9</td>
<td>108 98,2</td>
<td>208(94,5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child health care</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>61 55,5</td>
<td>37 33,6</td>
<td>98(44,5)</td>
<td>0,957</td>
<td>0,311</td>
<td>0,888</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>49 44,5</td>
<td>73 66,4</td>
<td>122(55,5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand washing practices</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>85 77,3</td>
<td>76 69,1</td>
<td>161(73,2)</td>
<td>0,939</td>
<td>0,339</td>
<td>0,852</td>
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<tr>
<td>Good</td>
<td>25 22,7</td>
<td>34 30,9</td>
<td>59(26,8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of water</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>21 19,1</td>
<td>14 12,7</td>
<td>35(15,9)</td>
<td>1,914</td>
<td>0,317</td>
<td>0,040</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>89 80,9</td>
<td>96 87,3</td>
<td>185(84,1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>54 49,1</td>
<td>28 25,5</td>
<td>82(37,3)</td>
<td>0,414</td>
<td>0,325</td>
<td>0,007</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>56 50,9</td>
<td>82 74,5</td>
<td>138(62,7)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table 2 shows that the number of children with complete immunization was higher than that of children with incomplete immunization. Most mothers of stunting children did not do child health care so well. The practice of hand washing on stunting and normal groups was largely bad (unqualified). The source of clean water and drinking water in the stunting group and the normal large sections is good. Sanitation in the stunting and normal group is more eligible (good).

The results of the present study have shown that complete basic immunization, child health care, hand washing, drinking water and clean water, and sanitation had significant effects on stunting. Providing immunization to children during early life can improve child immunity so that children are not susceptible to certain infectious diseases which in turn can aggravate health conditions and nutritional status. The results of this study were consistent with other studies showing that vaccination had a significant effect on stunting, children who were not given complete immunization were three times more likely to have stunting than children who were given complete immunization. Most of the respondents's children had a complete baseline immunization history and the immunization proceedings were effective. However, complete basic immunization if not matched with a good intake of macronutrients and micronutrients and the presence of recurrent infections in children can worsen stunting conditions in children.

Table 3 shows that the results of multivariate analysis with multiple logistic regression test, we can see that the sources of clean water and drinking water (p = 0.040; B = 1.914), sanitation (p = 0.007; B = 0.414) and basic immunization completeness (p = 0.000 B = 0.260) were the dominant factors affecting the incidence of stunting in children. However, child health care practices and hand washing practices did not significantly affect stunting for pediatric health (p = 0.888; B = 0.957) and for handwashing practice (p = 0.852; B = 0.939).

Discussion

The respondents of this study were dominated by low-educated mothers. Education is one of the factors that can influence the practice of mother care for children because it is closely related to knowledge. Highly educated mothers generally have an understanding of better child care and nutrition than low-educated mothers. Highly educated mothers also have the ability to read and understand health information media so as to have greater opportunity to be exposed to nutrition and childcare education. The respondents were mostly housewives. Housewives have more time and will spend their daily lives caring for children at home so that they tend to perform better maintenance practices compared to mothers working outside.

The results of the present study are consistent with other studies showing that complete basic immunization, child health care, hand washing, drinking water and clean water, and sanitation had significant effects on stunting. Providing immunization to children during early life can improve child immunity so that children are not susceptible to certain infectious diseases which in turn can aggravate health conditions and nutritional status. The results of this study were consistent with other studies showing that vaccination had a significant effect on stunting, children who were not given complete immunization were three times more likely to have stunting than children who were given complete immunization. Most of the respondents's children had a complete baseline immunization history and the immunization proceedings were effective. However, complete basic immunization if not matched with a good intake of macronutrients and micronutrients and the presence of recurrent infections in children can worsen stunting conditions in children.

The results of the present study is also in accordance with other research results in Nigeria showing that there is a significant relationship between child health care with stunting. Mothers who are able to perform child health care routinely check the health conditions of children in health facilities and understand the actions that need to be done if the child is sick, then the child has a smaller risk to experience infectious diseases and malnutrition.

Hand washing practices also affect stunting in children. Most respondents did not perform good hand washing habits before preparing food, before meals, and before feeding the children. Hand washing practices are associated with stunting and child malnutrition through episodes of infectious diseases in children. The results of this study are consistent with other studies showing that poor handwashing practices in mothers with children younger than 2 years in urban areas with
low socioeconomic levels are associated with higher episodes and duration of diarrhea\(^6\).

Source of clean water, drinking water and sanitation also affects the incidence of stunting in children. The results of this study are consistent with studies in Ethiopia showing that good water quality can reduce the incidence of diarrhea in children\(^7\). Sources of clean water and drinking water is the first route of exposure to infectious diseases and better water sources will not be beneficial to health if not accompanied by improved sanitation and good water storage practices\(^8,9\).

Providing a good source of clean water and drinking water will reduce the incidence of infection in children through the prevention of microbiological contamination or certain chemicals during hand washing, on cutlery, bathing, drinking and cooking. Drinking water from an uncooked spring can result in food borne disease. The ripening process of drinking water for children is needed to minimize child contact with pathogens and reduce the incidence of diarrhea. Other research results in India and Indonesia also show that water consumption with water filters and bottled water use is associated with reduced risk of diarrhea in children\(^10\).

Poor sanitation practices are associated with stunting incidence. This result is consistent with research conducted in India showing that an increase in open defecation by 10% is associated with an increase in stunting events of 0.7%\(^11\). Wastes exposed in open areas with poor sanitation conditions and ineligibility can be a potential spot for flies to spawn and multiply, resulting in faecal borne disease. Poor sanitation practices can result in poor environmental health, thus increasing the vulnerability of children to infectious diseases that are one of the causes of malnutrition including stunting\(^3\).

**Conclusion**

Basic immunizations, sources of clean water and drinking water, and sanitation affect stunting in children. Based on these conclusions, it is suggested to Community Health Centers to improve the socialization of hygiene practices in the community to prevent infectious diseases in children. Further research is needed on other factors that affect stunting incidence in children, especially those related to socio-cultural factors of the local community.

**Conflict of Interest** : There was no conflict of interest in the study.

**Ethical Clearance**

The study was received ethical approval from the Health Research Ethics Committee, Faculty of Public Health, Airlangga University

**Source of Funding** : Self

**References**


Comparison of Needs and Demand on Health Services: A Cross-Sectional Survey in Indonesia

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Student of Health Policy Administration Program Study, Faculty of Public Health, Airlangga University, Indonesia

Abstract

Health is a capital to work and live to develop offspring. Demand to be healthy is not the same among humans. In the economic activity of health, learning about the needs and demand is needed to determine the level of consumer demand for a product (not just about goods but also health services) so that by knowing it producers (health facilities) can determine attitudes and actions to meet the needs of the consumer (prospective patient). The research method was an descriptive observation with cross sectional design. Sampling is done by quota sampling technique where the research team determine the sample size for the survey of need and demand of health services. The sample size of this research is 100 people. Samples are taken randomly in some areas of Indonesia in Surabaya, Jakarta, Kalimantan, Sulawesi, Bali and Sumatera areas to meet specified quota. The results obtained comparison between need and demand for health service destination is mean 1,46 %. Comparison between needs and demand for speed of service is mean 5,225 %. Comparison of needs and demand for health information from officers is mean 0,94 %. Comparison of needs and demand for ease of health services is mean 1,44 %. There are still gaps because of the factors where health services need aspect, many respondents make a doctor or dentist general practice as a place of choice of health services, whereas on demand, respondents turned out to come to many private hospitals for health services, none gap on the convenience factor of the health service because there is a gap in the speed factor of service and there is no gap in the health information factor of the officer.

Keywords: Need; Demand; Health Services.

Introduction

Individuals will seek to achieve health status by investing and / or consuming a number of goods and services health. To achieve good health is needed good health facilities. Microeconomic theory of the demand for health care services, if health is a normal good, for an individual in a given health, health care will be normal as well. That is, increases in incomes lead to greater demand for health care services. If the income expansion, the health care is a luxury good, and as income increases, a higher share is devoted to health care.

Generally, need and demand of health services can be described in a concept called ice-berg phenomenon. This concept refers to the notion that the right demand should be part of need. Conceptually, need for health services can form an iceberg which is only slightly peak seen as demand. Demand is goods or services actually purchased by the patient. Demand is influenced by the medical opinion of the physician, as well as other factors such as drug revenues and prices. Demand is different from need and want. Wants (wishes) are goods or services that the patient wants because they are best for them (for example, fast-acting drugs). Wants can be the same or different with need.

Need is the quantity of goods or service that is objectively considered best to be used to improve the patient’s health condition. Need is usually determined by...
the doctor, but the quality of the doctor’s consideration depends on the education, equipment, and competence of the doctor. Demand health services is the actual service purchased by the customer health care, in this case is the patient. Demand is influenced by the medical opinion of the physician, as well as other factors such as drug revenues and prices. Demand health services is a health service needed and desired by patients who are accompanied also with purchasing power owned by the patient.

The formula for demand of health services are as follows:

\[
Q_{dmc} = f \left( \text{disease incidence}, \text{provider} \mid \text{cultural-demographic characteristics, economic factors, etc.} \right)
\]

Increasing demand in health services is currently heavily influenced by: a) Quality of health services provided, b) Postpartum care, c) Performance of health services, d) Ease of use of services, e) Payment system. Several factors affecting consumer demand for medical services both in terms of patients and from the providers of medical services are: 1) the incidence of illness 2) cultural and demographic characteristics consisting of: gender, age, marital status, education, patient preferences, 3) economic factors consisting of income, prices, health insurance, time value.

Based on the explanation of the above problem formulation, the purpose of this paper is to know description about need and demand of the community on health services in several regions in Indonesia.

### Materials and Method

This research is an analytic obervesional research with cross sectional study design. The Population in this research was resident in Indonesia. The samples were a part of the population taken as a data source and is considered to represent the entire population. Sampling was done by quota sampling technique where the research team determine the sample size for the survey of need and demand of health services. The sample size of this research is 100 people. Samples are taken randomly in some areas of Indonesia in Surabaya, Jakarta, Kalimantan, Sulawesi, Bali and Sumatera areas to meet specified quota.

This research was conducted online where the instrument is distributed to respondents through online media. Data collection research uses primary data on community needs in general health services. Instruments used in research need and demand is an online questionnaire.

### Result

According to the survey results, the specific comparison of needs and demand on health services can be seen in the following table 1:

### Table 1. Result of Comparison of Needs and Demand on Health Services

<table>
<thead>
<tr>
<th>Health Service</th>
<th>Need (%)</th>
<th>Demand (%)</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Service Destination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midwife/nurse</td>
<td>4</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>Medical specialist</td>
<td>20</td>
<td>19</td>
<td>1.05</td>
</tr>
<tr>
<td>Doctor/dentist general practice</td>
<td>24</td>
<td>14</td>
<td>1.7</td>
</tr>
<tr>
<td>Clinic</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Primary health care</td>
<td>6</td>
<td>11</td>
<td>0.54</td>
</tr>
<tr>
<td>Non-governmental hospitals</td>
<td>17</td>
<td>29</td>
<td>0.59</td>
</tr>
<tr>
<td>Government hospital</td>
<td>23</td>
<td>20</td>
<td>1.15</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>3</td>
<td>0.33</td>
</tr>
</tbody>
</table>

#### Speed of service

<table>
<thead>
<tr>
<th>Speed of service</th>
<th>Need (%)</th>
<th>Demand (%)</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10 menit</td>
<td>55</td>
<td>3</td>
<td>18.3</td>
</tr>
<tr>
<td>10 – 15 menit</td>
<td>40</td>
<td>17</td>
<td>2.35</td>
</tr>
<tr>
<td>&gt;15 menit</td>
<td>5</td>
<td>20</td>
<td>0.25</td>
</tr>
<tr>
<td>Lain-lain</td>
<td>0</td>
<td>38</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Information about Health

<table>
<thead>
<tr>
<th>Information about Health</th>
<th>Need (%)</th>
<th>Demand (%)</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs and diet restrictions</td>
<td>4</td>
<td>29</td>
<td>0.14</td>
</tr>
<tr>
<td>Diagnosis of disease</td>
<td>64</td>
<td>13</td>
<td>4.92</td>
</tr>
<tr>
<td>Diagnosis of the cause and process of healing</td>
<td>1</td>
<td>24</td>
<td>0.04</td>
</tr>
<tr>
<td>The cause of illness</td>
<td>17</td>
<td>33</td>
<td>0.52</td>
</tr>
<tr>
<td>Disease prognosis</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Ease of Health Services

<table>
<thead>
<tr>
<th>Ease of Health Services</th>
<th>Need (%)</th>
<th>Demand (%)</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordable cost</td>
<td>19</td>
<td>11</td>
<td>1.73</td>
</tr>
<tr>
<td>Easy to get health service</td>
<td>65</td>
<td>76</td>
<td>0.86</td>
</tr>
<tr>
<td>Ease of administration</td>
<td>14</td>
<td>12</td>
<td>1.17</td>
</tr>
<tr>
<td>Easy to get means of transportation</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Discussion

Demand embodiment of health services may not be in accordance with what is desired due to many things, such as urgent conditions or factors of trust and comfort. There are several factors that can affect one’s need and demand in the utilization of health services. Based on the results of this study, the most respondents need health service destination is doctors or dentists general practice as a place of health service (24%). The most respondents demand health service destination is non-governmental hospitals as a place of health service (29%). This gap can be motivated by various things such as the belief that people believe more to come to the government hospital with a more complete perception or others. In addition, the need factor where it is possible that the needs of the community for health services are widely available in government hospitals compared to the very limited practice of doctors.

Access to health services must be attainable by the community, not hindered by geographical, social, economic, organizational and language conditions. One of them is the geographical state that can be measured by distance, length of travel, type of transport and or other physical barriers that may prevent a person from obtaining health services. Health services that are located too far from the area of residence is not easy to achieve, so it requires transportation to reach the health service, if this situation to happen, certainly will not satisfy the patient, so called a quality health service if the service can be achieved by service users health services.

Health services can be included in the economic concept so that can be learned about needs and demand in health services. Therefore, we need to know and learn what things are needed and desired by consumers as patients to a health service.

Conclusion

There is still a gap between what is wanted from a health facility and what the health care workers in the health facility meet. The gap is quite striking visible in the purpose of health services and speed of health services. This needs attention so that there are improvements and improvements so that between need and demand is suitable or aligned and there is no gap anymore.

Ethical Approval: Related departments should be assured about the confidentiality of the results of questionnaires.

Conflict of Interest: The authors report no conflict of interest.

Source of Funding: Self

References

Perception on Lasik Surgery Services in Public Eye Hospital of East Java

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Abstract

Visiting of lasik surgery patients in Public Eye Hospital of East Java in 2016 is quite low (9%) while in 2017 increased (10%) but still below target. Such low achievements are likely to be influenced by consumer perceptions of lasik surgery services. This study aims to assess the community perception of lasik surgery services in Public Eye Hospital of East Java. Assessment of perception includes price, people, process and physical evidence. This study shows that respondents’ perceptions of lasik surgery rates are cheaper than those in other hospitals. Overall perception of officers and service process lasik surgery is good. While the perception of respondents to the physical appearance has not been good, because respondents feel not satisfied with hospital facilities. This research recommends innovation in marketing efforts lasik surgery service and hospital management need to improve infrastructure facilities.

Keywords: perception, lasik surgery services, Public Eye Hospital of East Java

Introduction

Eyes are the sense of vision that serves to absorb visual information. Impairments to vision include mild disturbances and severe disorders that can lead to blindness. Efforts to prevent and cope with visual impairment and blindness need to get attention both by government and society.

The World Health Organization (WHO) established the Vision 2020 program to address blindness and vision problems. Based on data from WHO, worldwide in 2010 there were 285 million people (4.24%) of the population with visual impairment, 39 million (0.58%) with blindness and 246 million (3.65%) with low vision. The most common causes of vision loss are refractive disorders (43%), cataract (33%), and glaucoma (2%).

In Indonesia, Vision 2020 was launched on February 15, 2000. Indonesia’s population suffered from blindness of about 1.5% or 3.6 million. The incidence of blindness caused by refractive abnormalities ranks first as the cause of blindness in Indonesia. According to Basic Health Research (Riskesdas) in 2013 showed that the prevalence of refractive disorder of 22.1% of the total population and the proportion of glasses or contact lens users over 6 years of age in Indonesia is 4.6%, the proportion of sharp decline eyesight of 0.9%, the proportion of blindness of 0.4%. While the proportion of glasses or contact lens users in the population above 6 years old in East Java province was 4.8%, the proportion of sharp decline of vision by 1.0%, the proportion of blindness by 0.4%.

The data of eye surgery visit in Public Eye Hospital of East Java in 2015 until 2017 shows that cataract surgery trend has increased. Board of National Health Insurance (BPJS) policy which prohibits cataract operation service outside in Public Eye Hospital of East Java and policy of restriction of service area coverage with direct referral letter from primary health facility only in 3 (three) regions Surabaya, Gresik and Sidoarjo no impact to decrease number of cataract surgery. Small operations consisting of pterigium, hordeolum, granuloma, intropion repositioning and others have increased significantly. Meanwhile, the achievement of lasik surgery patients in 2016 is quite low (9%) while in 2017 increased by 10% but still below the target of 480 people per year (100%).

The low utilization of lasik surgery services is influenced by consumer perception. If people have a good perception of lasik surgery service then more and more people use the service. This study aims to assess
the public perception of lasik surgery service in Public Eye Hospital of East Java.

Method

Descriptive observational research involves 72 respondents (32 actual patients and 40 potential patients). Potential patient criteria are aged 18-40 years, only get prescription glasses or medicine and are willing to be interviewed in the filling questionnaire. While the actual patient criteria aged 18-40 years, had done pre lasik examination or lasik surgery in Public Eye Hospital of East Java and willing to be interviewed in filling questionnaire.

Sampling using judgment sampling technique. This study assesses respondents’ perceptions of several aspects including tariffs, service personnel, service process and physical appearance. Data processing includes (1) data editing, checking completeness and suitability of questionnaires that have been filled respondents; (2) coding, coding of each respondent’s answer in the questionnaire; (3) data entry, entering respondent data into Ms. program Excel; (4) cleaning, re-checking data that has been inputted; (5) preparation of frequency distribution tables, merging in tabular form so that the results obtained can be informative; and (7). Preparation of strategic issues.

Results and Discussion

Perceptions of tariffs consist of two indicators: tariff comparison with other hospitals and tariff compliance with patient’s ability. Respondents’ perception of lasik surgery rate is cheaper compared to other hospital tariff with average 3.2 whereas perception of respondents who do not do lasik operation stated that most of respondent less able to do lasik operation with average 2.2. Overall perception of the lasik group of patients was good with an average of 3.2. The lowest average value of the perception of a group of patients who did not perform lasik surgery was the professionalism of the officer with an average of 3.10.

Respondent’s perception on service process of lasik operation have some indicator that is waiting time, clarity of service flow and speed of service of officer. Perception of respondents in the group of patients who did not perform lasik surgery on the waiting time has the lowest average value is 2.3 which means less good. Overall perception of respondents to the process of lasik surgery service in Public Eye Hospital of East Java included in the category either with the average of 3.0. Respondents perception on the group of patients who perform lasik surgery to the comfort and cleanliness of the waiting room and service room has the highest average value of 3.41 and 3.38 with very good category. Respondents’ perceptions of the completeness of hospital facilities such as canteen, and friction payment instruments, etc. are still not good enough with an average of 2.3 whereas toilet hygiene is also not good (2.4).

Table 1 Description of Respondents’ Perception Based on Assessment Indicators

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group 1: Potential Patient</th>
<th>Group 2: Actual Patient</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
<td>n(%)</td>
</tr>
<tr>
<td>Tariff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison of rates with other hospitals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>(2.5)</td>
<td>(12.5)</td>
<td>(77.5)</td>
</tr>
<tr>
<td>Tariff compliance with patient’s ability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>(17.5)</td>
<td>(50.0)</td>
<td>(27.5)</td>
</tr>
<tr>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionalism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>(0.0)</td>
<td>(10.0)</td>
<td>(70.0)</td>
</tr>
<tr>
<td>Friendliness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(0.0)</td>
<td>(5.0)</td>
<td>(75.0)</td>
</tr>
<tr>
<td>Cleanliness and tidiness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(0.0)</td>
<td>(5.0)</td>
<td>(75.0)</td>
</tr>
</tbody>
</table>
Table 1 Description of Respondents’ Perception Based on Assessment Indicators

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group 1: Potencial Patient</th>
<th>Group 2: Actual Patient</th>
<th>( \overline{X} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed of waiting time</td>
<td>0</td>
<td>27</td>
<td>13</td>
</tr>
<tr>
<td>Clarity of service flow</td>
<td>0</td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>Speed officers in service</td>
<td>0</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>Physical appearance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfort and cleanliness of the reception area</td>
<td>0</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>Comfort and clean room service</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Completeness of facilities in hospital</td>
<td>3</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Cleanliness of the toilet</td>
<td>1</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>Security and spacious parking area</td>
<td>0</td>
<td>7</td>
<td>31</td>
</tr>
</tbody>
</table>

Note:

(1) Very expensive, the average value is 1.0-1.7; (2) Expensive, the average value is 1.8-2.5; (3) Cheap, average value 2.6-3.3; (4) Very cheap, the average value is 3.4-4.0

Conclusion

This study shows that respondents’ perceptions of lasik surgery rates are cheaper than those in other hospitals. Overall perception of officers and service process lasik surgery is good. While the perception of respondents to the physical appearance has not been good, because respondents feel not satisfied with hospital facilities. This research recommends innovation in marketing efforts lasik surgery service and hospital management need to improve infrastructure facilities.

Conflict of Interest: The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

Source of Funding: All sources of funding from author.

Ethical Clearance: This study get the ethical approval from ethical committee in Faculty of Public Health, Universitas Airlangga.

References


Utilization Analysis of District Health Account Document in Health Planning and Budgeting Study in West and Central Lombok District

Alya Hazfiarini¹, Ernawaty²
¹Department of Health Policy and Administration, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia

Abstract

Health account is a tool which describes health expenditure systematically, comprehensively and consistently which used in national level (National Health Account/NHA), provincial level (Provincial Health Account/PHA) and district level (District Health Account/DHA). Besides, it can be used as a reference on developing health planning and budgeting in each area. West and Central Lombok District have been developed District Health Account (DHA) since 2006, but they did not utilize it as a reference for health planning and budgeting in district level. This study aimed to analyze awareness, interest, desire and action of stakeholder using AIDA model of hierarchy response in DHA program.

This research was a descriptive observational study with cross-sectional design. This research used purposive sampling technique. The respondents were DHA team, the structural official position of District Health Office and the structural official position of District Development and Planning Agency.

The study found that DHA team, the structural official position of District Health Office, and the structural official position of District Development and Planning Agency categorized into aware and desire category. However, the majority of the DHA team member, the structural official of District Health Office, and the structural official of District Development and Planning Agency in West Lombok District and Central Lombok District were categorized as uninterested and inaction category.

Keywords: Utilization, District Health Account, Health Planning, Health Budgeting, Health Office

Introduction

Health account is a tool which describes health expenditure systematically, comprehensively and consistently¹. Health account used in national level (National Health Account/NHA), provincial level (Provincial Health Account/PHA) and district level (District Health Account/DHA). West Lombok District and Central Lombok District have been developed DHA since 2006. Although DHA was prepared annually, not all DHA documents were available for every year. During 2010 till 2013, West Lombok District had the documents in 2011-2013 whereas Central Lombok District only had the documents in 2010 and 2013. According to interview with former head of program section at Central Lombok District Health Office, this incomplete archive happened because of the document making process stopped at data collection and analysis.

DOI Number: 10.5958/0976-5506.2019.02089.8
**Table 1. Health Expenditure based on Program Type in 2010 - 2013**

<table>
<thead>
<tr>
<th>Year</th>
<th>% Health Expenditure West Lombok District</th>
<th>% Health Expenditure Central Lombok District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual Health Program</td>
<td>Public Health Program</td>
</tr>
<tr>
<td>2010</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2011</td>
<td>52.73%</td>
<td>10.62%</td>
</tr>
<tr>
<td>2012</td>
<td>46.16%</td>
<td>14.3%</td>
</tr>
<tr>
<td>2013</td>
<td>26.72%</td>
<td>8.59%</td>
</tr>
</tbody>
</table>

Data of DHA document can be used as a reference for developing health planning and budgeting. According to Table 1, public health programs in both West Lombok District and Central Lombok District had the lowest percentages of health expenditure in 2010-2013. Moreover, according to report of Basic Health Research (Riskesdas) of West Nusa Tenggara Province in 2007 and 2013, there were five health problems which their percentage and prevalence increased from 2007 to 2013.

The five health problems which their percentage and prevalence increased from 2007 to 2013 in West Lombok District were percentage of stunting toddler, percentage of household which did not use defecation facility, percentage of malnutrition toddler, malaria prevalence and hepatitis prevalence. While the five health problems which their percentage and prevalence increased from 2007 to 2013 in Central Lombok District were percentage of stunting toddler, percentage of household which did not use defecation facility, acute respiratory infections prevalence, percentage of malnutrition toddler, and diarrhea prevalence.

According to Table 1, it can be concluded that DHA document was not used as a reference for developing health planning and budgeting in the districts. This study aimed to analyze awareness, interest, desire and action of stakeholders in DHA program using AIDA model of hierarchy response in West Lombok District and Central Lombok District.

**Method**

This was an observational study using cross sectional design. Data was collected in April 2016. Population of this study was all of the DHA teams, the structural officials of District Health Office and the structural officials of District Development and Planning Agency. The sample of the research was all of DHA team members; head of subsection, head of division, head of section or head of subdivision of the structural officials of District Health Office; and the structural officials of District Development and Planning Agency which covered health sector.

There were 49 respondents interviewed with a set of questionnaire using Likert scale. The questionnaire asked about respondents’ knowledge, perception, awareness, interest, desire and action towards DHA program in their district.

**Findings**

WHO stated that it is needed to form a team to arrange a health account document. Regulation of Ministry of Health No. 971 / 2009 explained that health account is a concept that should be owned by the head of Health Office in order to increase the ability and skill of basic planning and budgeting. According to Republic of Indonesia Government Decree No. 8 year 2003, District Development and Planning Agency was technical institution which responsible for district development plan. Nevertheless, the structural official of District Development and Planning Agency should understand district health account concept in order to develop health
sector development plan.

There were four people in DHA team of West Lombok District consisted of official of district health, official of general hospital, and official of financial management board and asset. On the other hand, DHA team in Central Lombok District consisted of district health official, development planning agency official and District Hospital official. Table 3 depicted the interview result which conducted by DHA team in West Lombok District and Central Lombok District.

**Table 2. Awareness, Interest, Desire and Action of DHA Team**

<table>
<thead>
<tr>
<th>Category</th>
<th>West Lombok District</th>
<th>Central Lombok District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aware</td>
<td>4 (100%)</td>
</tr>
<tr>
<td></td>
<td>Not Aware</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 (100%)</td>
</tr>
<tr>
<td>Interest</td>
<td>Interested</td>
<td>2 (50%)</td>
</tr>
<tr>
<td></td>
<td>Uninterested</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 (100%)</td>
</tr>
<tr>
<td>Desire</td>
<td>Desire</td>
<td>3 (75%)</td>
</tr>
<tr>
<td></td>
<td>Not Desire</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 (100%)</td>
</tr>
<tr>
<td>Action</td>
<td>Action</td>
<td>2 (50%)</td>
</tr>
<tr>
<td></td>
<td>Inaction</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 (100%)</td>
</tr>
</tbody>
</table>

Table 2 depicted that all of the DHA team in both districts was not aware with DHA program in their district. However, all of DHA team was not interested with DHA program. It meant that only 50% of DHA team of West Lombok District and 33% of DHA team of Central Lombok District which was interested with DHA program by trying to find out more information about it. Besides, desire of DHA team to utilize DHA document was higher than its interest.

**Table 3. Action Indicators of DHA Team**

<table>
<thead>
<tr>
<th>No</th>
<th>Indicators</th>
<th>West Lombok District</th>
<th>Central Lombok District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>Analysis and interpretation of DHA data</td>
<td>0 (0%)</td>
<td>4 (100%)</td>
</tr>
<tr>
<td>2</td>
<td>Arrangement of DHA document</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>3</td>
<td>Dissemination of DHA document to the head or structural official in each district</td>
<td>3 (75%)</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>4</td>
<td>Dissemination of DHA document to the district government or legislative</td>
<td>4 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>5</td>
<td>Archive DHA document</td>
<td>3 (75%)</td>
<td>1 (25%)</td>
</tr>
</tbody>
</table>
There were two indicators of action category of DHA Team which had low score (Table 3). The first indicator was arranged DHA document and the second was dissemination DHA document to other official structure in their office, district government, and district legislative. The indicator of arrangement of DHA document was low because not all of DHA team member in both districts involved in all technical process of DHA document arrangement. Moreover, the data collecting process was very difficult to obtain the data from all of district. The dissemination activity was low because the DHA team did not have authority and was lack of the support from district health office.

Table 4. Awareness, Interest, Desire and Action of Structural Position of District Health Office

<table>
<thead>
<tr>
<th>Category</th>
<th>West Lombok District</th>
<th>Central Lombok District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware</td>
<td>19 (100%)</td>
<td>19 (100%)</td>
</tr>
<tr>
<td>Not Aware</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td>19 (100%)</td>
<td>19 (100%)</td>
</tr>
<tr>
<td>Interest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interested</td>
<td>4 (21%)</td>
<td>4 (21%)</td>
</tr>
<tr>
<td>Uninterested</td>
<td>15 (79%)</td>
<td>15 (79%)</td>
</tr>
<tr>
<td>Total</td>
<td>19 (100%)</td>
<td>19 (100%)</td>
</tr>
<tr>
<td>Desire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desire</td>
<td>18 (95%)</td>
<td>16 (84%)</td>
</tr>
<tr>
<td>Not Desire</td>
<td>1 (5%)</td>
<td>3 (16%)</td>
</tr>
<tr>
<td>Total</td>
<td>19 (100%)</td>
<td>19 (100%)</td>
</tr>
<tr>
<td>Action</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>2 (11%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Inaction</td>
<td>17 (89%)</td>
<td>19 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>19 (100%)</td>
<td>19 (100%)</td>
</tr>
</tbody>
</table>

Table 4 showed that all of the structural position of District Health Office in both district were aware about DHA program but only 21% of structural position of District Health Office were interested in DHA program. This meant that they tried to find out more information about DHA. Furthermore, desire level of the structural position of District Health Office more increased than the interest level. There were 95% of official of health office in West Lombok District and 84% of official of health office in Central Lombok District who had desire to utilize DHA document. This circumstance happened because they thought that DHA document was needed to summarize district health expenditure and important to utilize the DHA document. However, there were only 11% of structural official of health office in West Lombok District and none of structural official health office in Central Lombok District who categorized into action category.

Table 5. Action Indicators of Structural Position of District Health Office

<table>
<thead>
<tr>
<th>No</th>
<th>Indicators</th>
<th>West Lombok District</th>
<th>Central Lombok District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>Dissemination of DHA document to the district government or legislative</td>
<td>18 (95%)</td>
<td>1 (5%)</td>
</tr>
</tbody>
</table>
All of indicators of action category were low (Table 5). Most of reason why structural official of district health office in West Lombok District did not disseminate DHA document was they thought that it was not their obligation but it was obligation of program section in district health office.

The utilization of DHA document was low because the structural official in West Lombok and Central Lombok District Health Office stated that they had never seen DHA document. Another low indicator was archives of DHA document because they stated that DHA document was only archived at program sub-unit. Furthermore, the study also found that dissemination of DHA information to the structural official of District Health Office was ineffective and none of structural official followed the AIDA stage in chronological order.

Table 6 depicted that all of the structural official of District Development and Planning Agency were aware about the benefit of DHA. However, their interest to find out more information about DHA was lower than their awareness. There was 100% of structural official of development planning agency of West Lombok District and 50% of structural official of development planning agency of Central Lombok District that categorized into...
uninterested category. The structural official of West Lombok District stated that there was not coordination between District Development and Planning Agency and District Health Office about DHA program. Therefore, they did not have any interest on DHA document.

In addition, the desire to leverage DHA document in both districts was 100% for structural officials of District Development and Planning Agency because they were supported by their good perception about DHA. Result shows that there were 50% of structural officials of development planning agency of Central Lombok District which utilized DHA document. There was none of the structural officials of development planning agency of West Lombok district who utilized DHA data or document because they stated that they had never seen DHA data or document due to lack of coordination. The study found that there was only one structural official of Central Lombok District Development and Planning Agency who followed the AIDA model in chronological order. It showed that the information dissemination about DHA was ineffective in the structural official of District Development and Planning Agency.

Awareness was the stage when people aware with product or service. This stage also was known as knowledge level\(^7\). Awareness of respondents with DHA program was supported by their knowledge of DHA. Furthermore, it also supported by their education background which related to health sector or health account. As mentioned by Notoatmodjo\(^8\), education background was one of factor which influenced people awareness.

Interest was the stage when people response to the information, the product or the service through their emotion, specific feeling or mood\(^9\). The result of this study showed that not all of the respondents interested with DHA program. People were aware with the product or service but they did not have interest to find out more information about the product or the service\(^10\).

Desire stage was also in the affective stage. This stage when people had desired to use or to buy the product or the service. Action was the stage when people fulfill their desire. The result showed that desire of all respondents in DHA program was higher than their interest. This condition was supported by Notoatmodjo\(^8\) that attitude did not reflect people action and vice versa.

The study found that there was none of DHA team member in both districts who followed AIDA stage in chronological order. According to Rawal\(^11\) dissemination of information was effective if people followed AIDA stage in chronological order. This meant that dissemination information about DHA in DHA team was not effective.

**Conclusion**

Based on the study, it can be concluded that the low utilization of DHA document were caused by several factors in DHA Team, District Health Office, and District Development and Planning Agency. Result showed that the technical ability and knowledge of DHA Team still categorized as average. Research also showed that the structural official of District Health Office and District Development and Planning Agency mostly never attend DHA training, there were low district regulation which support utilization of DHA, most of DHA Team and the structural officer of DHO and District Development and Planning Agency was uninterested and inaction regarding DHA document, and lack of information dissemination of DHA document.

According to study result and discussion, this study suggested that it was needed to increase role of member of DHA team in both districts in order to increase their action to utilize DHA document. Besides, they should optimize the information dissemination about DHA to the structural official of district health office and the structural official of development planning agency in both districts in order to increase their interest on DHA. Last, coordination with District Development and Planning Agency was needed in order to increase stakeholder action to utilize DHA document.

**Conflict of Interest:** The authors have no conflicts of interest in regard to this research or its funding.

**Source of Funding:** Research funding fully covered by the researcher.

**Ethical Clearance:** This research has been proved by Health Research Ethics Committee, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia Number 61 – KEPK approved in 22\(^\text{nd}\) March 2016.

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The Analysis Distribution of Filariasis Vector in Sanggu Village, Southern Barito District

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Abstract

One of filariasis endemic area is located in South Barito, Central Kalimantan, and Indonesia. Finger blood surveys were first conducted in 2004 in Sanggu with 1.34% f rate. The objective of this study is to analyze the spread of filariasis vector in Sanggu, South Barito. The sample of this study is all of the mosquitoes which caught inside and outside the houses which come from 3 point of research location that includes settlement like forest, swamp and lake. The results showed that there are number of species of mosquitoes. Culex sp were found outside and inside the house and 5 species of mosquitoes were; Mansonia sp, Culex sp, Anopheles sp, Aedes aegypti and Aedes albopictus found near in the swamp, lake and forest. The conclusion of the study showed that the most caught mosquito species were Culex Sp and Mosquito as filariasis vector that is inside the house of 12 heads / person / hour and outside of house is 27.2 tail / person / hour. These could be influenced by the temperature and humidity in the village ranging from 24 ℃ - 28 ℃ and 84% - 90%. The prevention could be done by socializing the discovery of chronic filariasis sufferer, spraying, collecting data of chronic filariasis patient, keeping the house always clean, cleaning environment; cutting shrub or tree and its branches so that sunlight could shine the entire house.

Keywords: Filariasis, vector, Culex sp

Introduction

Filariasis or elephantiasis disease is a chronic infectious disease due to parasitic infection of the nematode group that attacks the human lymphatic system directly. [1]. Filariasis disease which occurring in Indonesia is filariasis of lymph nodes. [2], the very complex factors are caused this disease which includes the worms as the agents, humans as the host, and adult mosquitoes as the vectors. More than 1.4 billion people in 73 countries are at risk of being infected with filari worms. Approximately 65% of the infected are in the Southeast Asian region, 30% in the African region, and remains are in the tropics. Lymphatic filariasis causes more than 25 million men with genital disorders and more than 15 million people with lymph oedema. [3].

There are three species of filariasis-causing worms: Wuchereria bancrofti, Brugia malayi, and Brugia timori. All of these species are existed in Indonesia, but more than 70% of filariasis cases in Indonesia are caused by Brugia malayi [4,5]. From the data reported in 2002-2014 cumulatively there are 14,932 chronic cases of filariasis cases spread in 418 districts / cities in 34 provinces in Indonesia. While the highest defect cases is in East Nusa Tenggara with 3,175 cases in 20 districts / cities [6].

In 2014, there are cases of chronic filariasis as 227 cases from 14 districts / cities in Central Kalimantan Province which classified as endemic filariasis and one of them is located in South Barito. [6]. The filariasis morbidity highest case of South Barito is located in Sanggu Village with the ratio 11 per 100,000 populations with Mf rate of 1.1%. B. Malayi microfilaria was found[7]. In 2016, 6 positive people were found as another new case of filariasis in Sanggu village which not as much as in 2014 [7]. Sanggu village has a total area of 5,800 ha / km2, 2,152 ha / km2 of forest, 300 ha / m2 of swamps, rivers / lakes with 30 hectares of land and a rice field of 800 ha / m2 [8,9] which resulting to be a place of mosquitoes habitat to live and cause filariasis disease.

The purpose of this research is to analyze the spread of filariasis vector in Sanggu Village, South Barito.
Material and Method

The study sample was all mosquitoes which caught inside and outside the home. Sampling was conducted at 3 points on settlements such as forests, swamps and rivers / lakes located in Sanggu Village, South Barito Regency. The Parameters used in this study to measure filariasis vector density are as follows: [10,11,12,13]:

- Man Biting Rate (MBR).
- Man Hour Density (MHD).
- Abundance Relative.
- Figures Frequency.
- The species domination number.

Finding

The results of mosquitoes caught is conducted on 3 houses in Sanggu Village with inside and outside the house using aspirator located in swamp, lake, and forest are as follows:

Number of mosquito species inside and outside the house

Swamp area, indicating that the mosquitoes caught outside the house amounted to 14 consisting of 3 species; Mansonia sp, Culex sp and Aedes sp. The highest number was Culex sp total with 8 (57.14%) and the lowest catch was Aedes sp with 2 (14.3%). While in the house amounted to 1 consists of 1 species, namely Aedes aegypti (100%).

Lake area showed that the mosquitoes caught outside the house numbered in 44 consisting of 5 species; Mansonia sp, Culex sp, Aedes aegypti, Aedes albopictus and Anopheles sp. The highest number of catches was Culex sp total with 18 (40.9%) and the lowest catch was Anopheles sp with 3 (6.8%). While in the house amounted to 15 consisting of 4 species; Mansonia sp, Culex sp, Aedes aegypti and Anopheles sp. The highest number of catches was Culex sp totaling 6 (40%) and the lowest catch was Mansonia sp with 1 (13.3%).

Forests area, indicating that the mosquitoes caught outside the house amounted to 10 tails consisting of 2 species; Culex sp and Aedes aegypti. The highest number of catches was Aedes aegypti (9%) and the lowest catch was Culex sp (1%). While in the house amounted to 14 tails consisting of 3 species; Mansonia sp, Culex sp, and Aedes aegypti. The highest number of catches was 8 culex sp (57.1%) and the lowest catch was Aedes aegypti with 1 (13.3%).

Relative abundance, frequency and species dominance

In the house near the swamp found the dominance of the mosquito is Aedes aegypti with the acquisition of the dominance is 8 and with the frequency value is 0.08. Then the house near the lake obtained the highest dominant number of mosquitoes namely Culex sp and Aedes aegypti with the acquisition of the dominance is 20 and with the frequency value is 0.5, while the lowest dominant number of mosquitoes in the house is Mansonia sp with the acquisition of the dominance is 0.53 and with a frequency value of 0.08. The house near the forest obtained the highest mosquito dominance in the house is Culex sp with the acquisition of the dominance number is 34.2 and with the frequency value is 0.6, while the lowest dominant number of mosquitoes in the house is Aedes aegypti with the acquisition of dominance is 0, 57 and with a frequency value of 0.08.

Population Density

Inside the house (Indoor) near lake, the mosquito population density is caught inside the home of each person / h. The highest catching species of mosquitoes
are Culex sp and Aedes aegypti with 9.09 individuals per hour and the lowest catch is Mansonia sp with 2 per person per hour.

Outside the house (Outdoor) near the lake, the population density of mosquitoes caught outdoors each person/hr mosquito species with the highest catch is Culex sp with 27.2 for each person per hour and the lowest catch is Anopheles sp with 4.6 per person per hour.

**Mosquitoes Biting Activity Patterns**

Inside the house, it was found that the highest peak fluctuation is Mansonia sp caught with human baiting inside the house at 24.00 - 01.00 WIB (western Indonesian time) and Aedes sp caught with human baiting inside the house at 03.00 - 04.00 WIB located in the forest. The details are shown as follows, the highest fluctuation of Mansonia sp is at 24.00-01.00 WIB ie 7.57, Culex sp the highest peak of fluctuation is at 23.00-24.00 WIB ie 4.54, Aedes sp’s peak fluctuation is at 05.00-06.00 WIB ie 4.54 and Anopheles sp’s the highest peak of fluctuation is at 23:00 to 24:00 pm with 3.03.

Outside the house, the highest fluctuation of Aedes sp caught with human baiting is at 02.00 - 03.00 WIB located in the lake. The highest fluctuation of Aedes sp is at 02.00 - 03.00 WIB ie 12.1; Culex sp is at 02.00 - 03.00 WIB ie 7.57, Mansonia sp at 19.00 - 20.00 WIB ie 3.03.

**Environmental conditions**

Swamp, the environmental condition of Sanggu village is adjacent to the swamp of the waste water discharged directly to the soil, the number of trees and the existence of wild plants like bushes around the house, so it could support mosquito’s breeding which cause filariasis, besides, the optimum temperature conditions is 25- 28 °C and 84-90% humidity. Thus, a moist condition could also affect mosquito growth.

Lake. the environmental conditions of Sanggu villages is located around the lake which known as a plenty of water plants such as water hyacinth, therefore, it could support mosquito’s breeding, in addition, the optimum temperature conditions is ranging from 26-28 °C and the humidity level is 84-89%.

Forest. the environmental conditions of Sanggu village is close to the forest which known as much lushes, trees and puddles (which favoured by mosquitoes). It could support mosquito’s breeding, besides, the optimum temperature condition ranges from 26-28 °C and 84-89% for humidity’s level.

**Discussion**

The species of mosquito Mansonia sp and Culex sp:

**Mansonia sp**

These mosquitoes are always caught either by using human baiting outdoors which close to the swamp. The species of mosquitoes were found outside the house with the highest fluctuation at 19.00 - 20.00 WIB (3.03%) and the lowest fluctuation at 04.00 - 05.00 WIB (1.51%). The mosquitoes are very fond of a full water area with a water plants such as hyacinth, located in lake. In the house around the lake, found this mosquito species with the highest fluctuation at 22.00 - 23.00 WIB (1.51%) and in outdoors, found this species of mosquitoes with the highest fluctuation at 04.00 - 05.00 WIB (3.03%). As for the mosquito in the forest, they are very fond of a place with much of trees lush, especially if the tree has a cavity-range on the trunk. Inside the house around the forest, found the mosquito species with the highest fluctuation is at 24.00 - 01.00 WIB (7.57%). These circumstances is due to several factors, called temperature and humidity that support mosquitoes activity or biting with 25 °C temperature and 90% humidity level. Thus, it could affect mosquito’s activeness. And also 60% moist’s level is the lowest limit for mosquito to life.

**Culex sp**

These mosquitoes are active throughout the night and are always caught either by using human baiting outdoors or close to the swamp. This mosquito species was found outside the house near the swamp with the highest fluctuation at 22.00 - 23.00 WIB (6.06%) and the lowest fluctuation at 04.00 - 05.00 WIB (1.51%). This mosquito is also located in a lot of water plants such as water hyacinth. In the house around the lake, found the mosquito species with the highest fluctuation at 23.00 - 24.00 WIB (4.54%) and outdoors, found this species of mosquitoes with the highest fluctuation at 02.00 - 03.00 WIB (7.57%) and lowest in the hours before its 21.00 - 22.00 WIB (3.03%). This mosquito is also located in the area much of lush trees, and has cavities on the trunk. Inside the house near the forest, mosquito species are found the highest fluctuation at 02.00 - 03.00 WIB (4.54%), outdoors; the mosquitoes
are with the highest fluctuation at 23.00 - 24.00 WIB (1.51%). These circumstances is due to several factors, called temperature and humidity that support mosquitoes activity or biting with 25 °C temperature and 90% humidity level. Thus, it could affect mosquito’s activeness. And also 60% moist’s level is the lowest limit for mosquito to life.

Factors affecting mosquito communities:

1. Population Density

The mosquito population in the house of each person / hour of Aedes aegypti mosquito species is 2 amounts/person / hour near the swamp. Mansonia sp with 2 amounts/ person / hour, Culex sp with 9.09 amounts/ person / hour, Aedes aegypti with 9.09 amounts / person / hour and Anopheles sp 3.03 amounts/ person / hour near the lake. And found Mansonia sp with 7.6 amounts / person / hour and Culex sp with 12 amounts/ person / hour.

2. Figures of frequency and dominance of mosquitoes

The largest frequency number of Mansonia sp mosquitoes inside the house was 0.41 also in the forest and outdoors, and 0.41 near the lake. While the largest frequency number of Culex sp mosquitoes is 0.6 located in the forest and outdoors, 0.66 is located in the swamp. The largest dominant number of Mansonia sp mosquitoes in the 14.63% house located in the forest and outside of the house 8.43%. While the dominant number of Culex sp mosquitoes inside the house is 34.2% located in forest and out of house, 61.3% is located near the lake.

Frequency rate is the ratio between the numbers of species of mosquitoes found in the capture to the number of arrests which means the most species of mosquitoes found in the 12 hour arrest. The dominant figure is the product of the multiplication of relative and the mean frequency is the acquisition of the numbers obtained in the most dominant (high) mosquito species that bite humans.

Since the vaccine for prevention does not yet exist, thus, the only way to prevent is to avoid getting bitten by mosquitoes. Since the mosquitoes are very large in amount and widespread, this effort needs to be done by the whole community by doing as follows:

1. Clean the sewer / gutter
2. Maintain fish in ponds
3. Wear bed nets when sleeping
4. Apply the medicine or cream anti mosquitos

The treatment could use diethylcarbamazine citrate (DEC, Banocide®, Hetrazan®, Notezine®); Given DEC 3 x 1 tablet 100 mg for 10 consecutive days and paracetamol 3 x 1 tablet 500 mg in the first 3 days. This treatment has been shown to be more effective when followed with once-daily treatment with low-dose DEC (25-50 mg / kg BW) for 5 consecutive years or salt consumption given DEC (02-0.4 mg / kg BW) during 5 years.

Conclusion

The highest mosquito population density inside the house is Culex sp with 12 amounts/ person / hour located in the forest, while the lowest is Mansonia sp for 2 amounts / person / hr located in the lake. The highest population density of mosquitoes outside the house is Culex sp with 27.2 amounts / person / hr located near the lake, again, while the lowest is Culex sp with 2 amounts/ person / hour but located in the forest. There are 5 (five) species of mosquitoes caught at the time of research inside and outside the house, namely Mansonia sp, Culex sp, Anopheles sp, Aedes aegypti and Aedes albopictus. Species of mosquitoes caught at the time of the study were filariasis-transmitting vectors of Mansonia sp and Culex sp. While those that acted as filariasis transmission vectors were Culex sp most caught outdoors with 27.2 amounts / person / hr located in the lake.

Conflict of Interest: none

Source of Funding: independent (self-based)

Ethical Clearence: This study was conducted after obtaining approval from the study respondents

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Relationship Between Knowledge, Attitude, and Stigma of Nurse Toward HIV/AIDS Mitigation on Dr. Doris Sylvanus Hospital Palangka Raya

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Abstract

One of the obstacles prevention of HIV/AIDS is that the self-limiting from the nurses to people living with HIV. This study to analyze the relationship between knowledge, attitudes and stigma of nurse on HIV/AIDS prevention effort in dr. Doris Sylvanus General Hospital in Palangka Raya. This research used the quantitative research method with a cross sectional method. The study population was all nurses at inpatient and outpatient at dr. Doris Sylvanus General Hospital of Palangka Raya, with a sample of 174 respondents. The sampling technique used is purposive sampling. The research variables were nurse knowledge about HIV/AIDS, nurse attitude toward PLWHA and stigma nurse to PLWHA as independent variable and effort of HIV/AIDS prevention as dependent variable. The research instrument used was a questionnaire. Result got value p value knowledge = 0.000, p value attitude = 0.000, p value stigma = 0.000. The most dominant variable multivariate test results was knowledge obtained value Exp. (B) = 64.7. From the result proves that knowledge, attitude and stigma are variables on HIV/AIDS prevention efforts. Knowledge is the most influential variable on HIV/AIDS prevention efforts. There is a significant relationship between knowledge, attitude and stigma of the nurses have an effect on HIV/AIDS prevention efforts in dr. Doris Sylvanus General Hospital Palangka Raya.

Keywords: Level of Knowledge, Nurse, HIV/AIDS, Attitude, Stigma, PLWHA

Introduction

HIV-AIDS continuously increasing in Indonesia, and mostly attacks young and productive age. The number of HIV cases in 2015 that is 30,935, in 2016 is 41,250 people, an increase of 10,315 people with HIV. While in 2017 that is still 10 376 people HIV cases in the first quarter. The number of AIDS cases in 2015 is 7,185 people, and in 2016 that is 7,491 people, an increase of 306 cases of AIDS. While the year 2017 still 7 people AIDS cases in the first quarter. Central Kalimantan Province consists of 13 districts and 1 city. The total number of HIV cases in 2015 is 134 people, in 2016 that is 141 people, there is an increase of HIV cases that is 7 people. While the year 2017 in the first quarter is still 13 people HIV cases. For the case of AIDS in 2015 that there are 26 people, in 2016 that is 59 people, an increase in AIDS cases 33 people. While the year 2017 still 7 people in the first quarter.

Data from the Central Kalimantan Provincial Health Office, HIV risk factors in 2017 were on the sex workers (9%), male likes (52%), transvestites (6%), customers (3%), couples (12%), -other (18%). Injecting Drug User (IDU) is drug misuse still not found (0%). Factors associated with increased cases are caused by sexual behavior in high-risk groups, community communities contributing to HIV transmission significantly.

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of cumulative for HIV cases there are 215 people, AIDS case there are 105 people, O DHA who drink Antiretroviral (ARV) there are 53 people and who do not take medicine there is 1 person. Hospital dr. Doris Sylvanus is a type B hospital that is the Regional General Hospital (RSUD) of Central Kalimantan Province in Palangkaraya City. RSUD dr. Doris Sylvanus has a Voluntary Counseling and Testing (VCT) clinic and a Clinic Care Support and Treatment (CST). The presence of stigma in among people living with HIV that is done by the health officer that is nurse still often happened. Fear of contact with ODHA clients due to lack of knowledge about the mode of transmission of HIV and nurse attitudes toward PLWHA causes HIV-positive clients to refuse to be examined because they do not want to know that they are HIV-infected will be treated with stigma. Level of nurse knowledge at RSUD dr. Doris Sylvanus in Kota Palangka Raya, that is good nurse knowledge (17%) is sufficient (37%), less (46%), while nurse attitude toward HIV/AIDS prevention is good (56%), enough (30%), and less (14%). While HIV/AIDS prevention efforts in dr. Doris Sylvanus in Kota Palangka Raya is good (50%), enough (15%) and less (35%).

Materials and Method

The type of research conducted in this study is quantitative by using cross sectional method. Population in this research is all nurses in outpatient and inpatient in dr. Doris Sylvanus in Kota Palangka Raya consisting of 426 nurses. Sampling technique is purposive sampling. In order to balance the sample of each room is adequate, then the balance between the number of members of the population based on each room (proportional sampling). The sampling process was grouped in 43 rooms to determine the number of samples, with a total sample of 174 respondents. The independent variable are knowledge, attitude and stigma. The dependent variable is the HIV/AIDS prevention effort.

Findings and Discussion

The Relationship Between Knowledge Toward HIV/AIDS Mitigation

Table 1. Knowledge of HIV/AIDS Mitigation

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>HIV/AIDS Prevention</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td>N %</td>
<td>N %</td>
</tr>
<tr>
<td>Less</td>
<td>7</td>
<td>4.0</td>
<td>5</td>
<td>2.9</td>
</tr>
<tr>
<td>Good</td>
<td>12</td>
<td>6.9</td>
<td>150</td>
<td>86.9</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>10.9</td>
<td>155</td>
<td>89.1</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

Based on Table 1, it is known that out of 162 (93.1%) have a good knowledge. This is because nurses know that HIV disease can be transmitted through mother to child. More than 90% of HIV-infected children are obtained from their mothers. Viruses can be transmitted from HIV-infected mothers to their children during pregnancy, during labor and breast-feeding. The purpose of Anti Retroviral (ARV) in pregnant women was 127 respondents (74.2%) answered correctly. This is due to the purpose of providing treatment Anti-Retroviral (ARV) in pregnant women is to prevent infection arising from a decrease in the maternal immune, improve the quality of life and reduce transmission from mother to child and to others. Prevent the progressivity of the disease and inhibit the decline in maternal immunity. The goal of ARV therapy is to reduce the rate of HIV transmission, reduce morbidity and mortality associated with HIV, restore and maintain immune function and suppress viral replication maximally.

Prevention strategy of transmission to pregnant mother with HIV to baby there are 120 respondents (68.9%). This is because the knowledge of nurses is still lacking on the strategy of transmission from HIV to child.
mothers. Prevention strategies of transmission from pregnant women with HIV to infants are early detection and ARV administration as early as possible (> 6 months at delivery). Prevention strategies for transmission of HIV-infected pregnant women to their infants are ANC services, HIV diagnosis, ARV therapy, safe delivery, management of infant and child feeding, delayed regulation of pregnancy, ARV and cotrimoxazole prophylaxis in children and diagnostic examination in children.¹

The results of this study are in line with research conducted by Muzayin (2013) which shows the existence of knowledge relation to HIV/AIDS prevention efforts in Boyolali District. Muzayin’s research results have a weak to moderate value. In the results of this study there is also a low knowledge of respondents. Still, low knowledge is made possible by the limited knowledge of HIV-AIDS that health professionals get through formal curricula during education.²

The Relationship Between Attitude Toward HIV/AIDS Mitigation

Table 2. Attitude of HIV/AIDS Mitigation

<table>
<thead>
<tr>
<th>Attitude</th>
<th>HIV/AIDS Prevention</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Less</td>
<td>13</td>
<td>5</td>
<td>80</td>
<td>15.5</td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td>148</td>
<td>85.1</td>
<td>88.5</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>155</td>
<td>89.1</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

From the data of attitude relationship analysis toward HIV/AIDS prevention efforts, it was found that as many as 5 people (4.0%) of respondents had less attitude, but HIV/AIDS prevention efforts were lacking. And as many as 148 people (85.1%) of respondents have a good attitude towards HIV/AIDS prevention efforts are good.

Based on the research result of the relationship between nurse attitude toward HIV/AIDS prevention efforts, where respondents good attitude toward HIV/AIDS prevention efforts either that is counted 148 respondent (85.1%). And it was found that as many as 5 people (4.0%) of respondents have less attitude, but HIV/AIDS prevention efforts are lacking. Attitude is a combination of affective, behavioral, and cognitive reactions to an object. Attitudes are a continuation of knowledge accompanied by a willingness and a tendency to act in accordance with that knowledge. Thus a positive attitude of health workers to people living with HIV will encourage them to act and behave a good role in HIV/AIDS prevention efforts.³

The Relationship Between Positive Stigma Toward HIV/AIDS Mitigation

Table 3. Positive Stigma on PLWHA

<table>
<thead>
<tr>
<th>Positive Stigma</th>
<th>HIV/AIDS Prevention</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Less</td>
<td>9</td>
<td>6</td>
<td>15</td>
<td>8.6</td>
</tr>
<tr>
<td>Good</td>
<td>10</td>
<td>149</td>
<td>85.7</td>
<td>91.4</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>155</td>
<td>89.1</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018
From data of research result got that as many as 6 people (3.4%) have positive stigma to ODHA, but counting effort less. And as many as 149 people (85.7%) of respondents have a positive stigma against good people living with HIV, but HIV/AIDS prevention efforts are good. This research uses several questions to measure positive stigma of nurses to PLHIV it can be seen that from 159 respondents who have positive stigma toward PLWHA who choose the statement of criterion agree, which ranks first is statement assuming that PLWHA deserve to get the same health service as other patient there are 160 responden (91.9%) agree. This is due to people living with HIV in the same way as patients in general. The right of PLWHA to obtain health insurance is a mandate of Law No. 40 of 2004 about National Social Security System. One form of social protection to ensure all people in order to meet the basic needs of his life. 

The fourth order of statements assumes that people living with HIV have the same rights as other patients there are 152 respondents (87.3%) agreed. The fifth ranking is the statement felt not afraid to provide care to patients who have tattooed his body because although I consider that people tattoo has a risk of HIV infection there are 139 respondents (79.8%) agreed. PLWHA who have tattoos will not transmit HIV, because of the transmission of HIV from sexual intercourse, syringes used interchangeably, sperm fluid and breast milk. HIV enters the body in three ways: sexual intercourse, non-sterile needle use or contamination of HIV, HIV transmission from an HIV mother to the fetus in the womb. 

The third order of revelation felt less comfortable when talking with people living with HIV/AIDS there are 97 respondents (55.7%) states disagree. This is due to the lack of positive stigma towards PLHIV feels less comfortable talking with PLWHA, HIV transmission is from sexual hambungan, sperm fluid, using a syringe alternately and from an HIV mother to her jan. HIV enters the body in three ways: sexual intercourse, non-sterile needle use or contamination of HIV, HIV transmission from an HIV mother to the fetus in the womb. 

The fifth sequence of the statement assumes that the food equipment used by people living with HIV is disgusting there are 91 respondents (52.2%) states disagree. This is due to the lack of positive stigma of nurses to PLWHA that the food equipment used by PLWHA can infect HIV. HIV enters the body in three ways: sexual intercourse, non-sterile needle use or contamination of HIV, HIV transmission from an HIV mother to the fetus in the womb. 

The results of this study are in line with Pujiono’s (2016) study indicating a relationship of knowledge and stigma to people living with HIV that the better the level of knowledge about HIV/AIDS then people tend to stay away from negative attitudes toward people living with HIV/AIDS then the person tends to be negative towards people living with HIV. 

This research is in line with research of Nurjanah (2016) stated health worker that tends to stigma and discrimination against people living with HIV that is 15 people (22.4%) and health worker who do not stigmatize and discrimination that is 52 people (77.6%). Stigma and discrimination due to lack of knowledge about HIV/AIDS transmission, treatment and prevention of HIV/AIDS.
Table 4. Logistic Regression Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beta Coefficients</th>
<th>Standard Error</th>
<th>Wald Test</th>
<th>Degree of Freedom</th>
<th>Significant</th>
<th>Exp. (B) (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>4.17</td>
<td>1.01</td>
<td>16.7</td>
<td>1</td>
<td>0.000</td>
<td>64.7 (8.9 - 476.9)</td>
</tr>
<tr>
<td>Attitude</td>
<td>37.4</td>
<td>0.90</td>
<td>17.3</td>
<td>1</td>
<td>0.000</td>
<td>42.4 (7.28 - 248.3)</td>
</tr>
<tr>
<td>Positive Stigma</td>
<td>3.35</td>
<td>0.98</td>
<td>11.6</td>
<td>1</td>
<td>0.000</td>
<td>28.7 (4.18 - 197.5)</td>
</tr>
<tr>
<td>Constant</td>
<td>-17.9</td>
<td>3.38</td>
<td>21.8</td>
<td>1</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

Based on the result of bivariate analysis, the three variables that are knowledge, attitude and stigma are qualified to be continued to multivariate test by multiple logistic regression test because p = 0.000 value to know which variable is the most dominant related to HIV/AIDS prevention effort to the respondent. Odd s ratio of nurse knowledge variable about HIV/AIDS = 64.7 which means that nurse knowledge about HIV/AIDS is good 64.7 times bigger chance in prevention HIV/AIDS, compared to the lack of nurse knowledge about HIV/AIDS. Knowledge is a cognitive domain that is very important formation of a person’s actions. If the adoption of a new behavior or the adoption of behavior is based on knowledge, then what is learned, among other things, the behavior will be lasting, otherwise if the behavior is not based on knowledge then it will not last long.³

Odd s ratio of nurse nurse attitude variable to PLHIV = 42.4 which means that nurse attitude toward good PLHIV 42.4 times bigger chance in HIV/AIDS prevention, compared with attitude of nurses to PLWHA less. Odd s ratio of nurses’ positive stigma variable to PLHIV = 28.7 which means that positive stigma of nurses to good people living with HIV/AIDS is 28.7 times bigger chance in HIV/AIDS prevention, compared to positive stigma of nurses to PLWHA less.

Conclusion

There was a significant correlation between knowledge of nurse with HIV/AIDS prevention in dr.Doris Sylvanus Hospital

There was a significant correlation between attitude of nurse with HIV/AIDS prevention in dr.Doris Sylvanus Hospital

There was a significant correlation between positive stigma of nurse with HIV/AIDS prevention in dr.Doris Sylvanus Hospital with knowledge as the most influential variable on HIV/AIDS prevention efforts (Exp. (B) = 64.7)

Ethical Clearance: Before conducting the data retrieval, the researchers conducted a decent test of ethics conducted at the Faculty of Medicine, Lambung Mangkurat University to determine that this study has met the feasibility. Information on an ethical test that the study is eligible to continue. The feasibility of the research was conducted in an effort to protect the human rights and security of research subjects.

Source Funding: This study was done by self-funding from the authors.

Conflict of Interest: The authors declare that they have no conflict interests.

References


The Comparison of Inflammation Response in Chronic Rhinosinusitis Patients with Nasal Polyp and Without Nasal Polyp: A Study on Interleukin 33 and Eosinophil Contents

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Abstract

Background: The research aimed to perceive the comparison of inflammation response (IL-33 and eosinophil contents) in chronic rhinosinusitis with nasal polyp and without nasal polyp, and the pathomechanism of nasal polyp incident on chronic rhinosinusitis.

Method: This was the cross sectional research with 40 patients. Each sample underwent IL-33 serum content examination, and nasal mucosa swab.

Results: The research result indicates that IL-33 serum contents were significantly higher (p <0.05) in patients with Chronic Rhinosinusitis without Nasal polyp than with Nasal polyps, While the number of eosinophils content in chronic rhinosinusitis with nasal polyps was significantly higher (p <0.05) than without nasal polyps

Conclusion: IL-33 has higher content on chronic rhinosinusitis without nasal polyp, IL-33 increases eosinophil content in chronic rhinosinusitis without nasal polyp, and the eosinophil has higher content on chronic rhinosinusitis with nasal polyp.

Keywords: Chronic Rhinosinusitis, Nasal polyp, Interleukin 33, Eosinophil

Introduction

Rhinosinusitis is a disease commonly found in everyday practice. In the United States according to the National Ambulatory Medical Care Survey in 2001 12.3 million health care visits were attributed to chronic rhinosinusitis (SSR) or 1.3% of total visits per year. Chronic rhinosinusitis is a problem for general practitioners and ear, nose, throat (ENT) experts given the complex etiology and high prevalence. In Europe, rhinosinusitis is thought to account for 10% to 30% of the population. In the United States in 1996, total health spending directly related to rhinosinusitis was estimated at 5.6 billion dollars. Of that figure, 58.7% (about 3.5 billion dollars) is related to SSR. It is estimated that 13.4-25 million doctor visits per year are associated with rhinosinusitis and / or its consequences. As many as 14% of the American population had at least one episode of rhinosinusitis during their lifetime and about 15% were estimated to have SSR. New rhinosinusitis incident in adult patients who came to the Rhinology Subdivision of ENT Department Cipto Mangunkusumo hospital January-August 2005 from 435 patients, 69 % (300 sufferers) suffered from rhinosinusitis, in Makassar from three teaching hospitals for the period 2003-2007 were reported as many as 41.5% of all cases handled by Rhinology Subdivision.¹,²,³,⁴

Chronic rhinosinusitis can be divided into two subtypes: chronic rhinosinusitis without nasal polyps and rhinosinusitis with nasal polyps. Both groups of rhinosinusitis differ in terms of inflammatory profiles and their remodeling processes, differences in these may affect prognosis, comorbid asthma, appropriate surgical procedures, and pharmacological management.⁵

Further research on T-helper (Th) cells has found that there is a role of Th cells in the pathogenesis...
of chronic rhinosinusitis with nasal polyps. Th cells themselves are divided into Th1 and Th2 based on the resulting cytokines. Th1 cells produce interferon (IFN)-γ. IFN-γ and Th1 cytokines increase defense against primary intracellular microbes, by activating neutrophils and macrophages. While Th2 cells are associated with eosinophil inflammation, and Th2 cells produce IL-4, IL-3, IL-33, and IL-13.

Chronic rhinosinusitis with nasal polyps often accompanied by eosinophilic inflammatory Th2 cells, whereas chronic rhinosinusitis without nasal polyps is characterized by most Th1 cell response. IL-33 is more abundant in chronic rhinosinusitis mucosal tissue with nasal polyp than without nasal polyps. Chronic polynomial rhinosinusitis is subdivided into two types of disease based on the level of eosinophilic inflammation, especially for people in East Asia: eosinophilic chronic rhinosinusitis (ECRS) and non-eosinophilic chronic rhinosinusitis (NECRS).

This study aims to see the inflammatory responses (IL-33 content) in chronic rhinosinusitis with nasal polyps and without nasal polyps and the pathomechanism of nasal polyps in chronic rhinosinusitis.

Method

Research Site:

This study was conducted in outpatient clinic of Dr. Wahidin Sudirohusodo Hospital, and other hospitals in Makassar, Molecular Biology Laboratory of education hospital Unhas, and Pathology Anatomy Laboratory of Education Hospital Unhas for period of January – March 2018

Design and Research Variables:

The design of this study is cross sectional with analytic observasional. The independent group of this study was patient with chronic rhinosinusitis without nasal polyp and with nasal polyp, while the dependent variable was the inflammatory response (IL-33 content).

Samples

The sampling technique was performed randomly. In this study all patients who have been diagnosed as chronic rhinosinusitis based on the history, the ENT diagnostic examination were undergone CT scan of paranasal sinus coronal view. The sample size is 40 patients were divided into 2 groups. Patients in the first group (20 patients) categorized as chronic rhinosinusitis with nasal polyps, and the second groups categorized as chronic rhinosinusitis without nasal polyps. Patients from both groups were examined for IL-33 serum content.

Exclusion Criteria:

Patients with severe systemic disease (kidney disease, liver disease, malignancy, autoimmune disease, and heart disease), sinonasal tumors, patients with a history of Endoscopic sinus surgery, severe septal deviation, septal perforation, rhinitis atrophy, serum sample lysis.

Statistical Analysis:

Data were analyzed using Statistical Package for Social Sciences (SPSS) software (version 23.0 for Windows; SPSS Inc, Chicago, IL).

Research Ethics Aspect:

The study permit was obtained from Biomedical Research Ethics Committee on Human Faculty of Medicine Universitas Hasanuddin (Register No. 31 / H4.8.4.5.31 / PP36-KOMETIK/2018).

Results

Characteristics

From a sample of 40 people, aged 21 to 40 years, with a mean age of 30.40 for chronic rhinosinusitis with nasal polyps and 31.70 for chronic rhinosinusitis without nasal polyps, and consisted of 15 men and 25 women.

Table 1. Characteristics of Research Subjects in Each Group

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Groups</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With Nasal polyps (n=20)</td>
<td>Without Nasal polyps (n=20)</td>
</tr>
<tr>
<td>Age (Mean)</td>
<td>30,40</td>
<td>31,70</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>12</td>
</tr>
</tbody>
</table>

Content of IL-33 Serum
Table 2 shows that serum content of IL-33 and IL-4 patients with chronic rhinosinusitis are higher than controls; respectively for IL-33 serum (Median 788.50 vs. 154.71). The results of the Mann-Whitney test showed significant difference (p <0.05) between the two groups.

**Tabel 2. Comparison of serum IL-33 content between Chronic Rhinosinusitis and Control group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chronic Rhinosinusitis</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (n=40)</td>
<td>No (n=10)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Level of IL-33 serum; Mean±SD(Median)</td>
<td>668.16±382.51 (788.50)</td>
<td>151.85±9.71 (154.71)</td>
<td></td>
</tr>
</tbody>
</table>

**Level of IL-33 Serum and Eosinophil Count**

Table 3 shows that serum IL-33 content were significantly higher (p <0.05) in patients with Chronic Rhinosinusitis without Nasal polyp than with Nasal polyps (median 859.65 vs 214.77). While the number of eosinophils counts in nasal polyps was significantly higher (p <0.05) than without Nasal polyps (median = 3.0 vs 2.0).

**Table 3. Comparison of IL-33, and eosinophil counts of Chronic Rhinosinusitis with Nasal polyps and Without Nasal polyps**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chronic Rhinosinusitis</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nasal polyp (n=20)</td>
<td>Without Polyp (n=20)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Level of IL-33 serum; Mean±SD(Median)</td>
<td>443.33±370.96 (214.77)</td>
<td>892.99±237.27 (859.65)</td>
<td></td>
</tr>
<tr>
<td>Eosinophil Count</td>
<td>1 – 4 (3,0)</td>
<td>1 – 4 (2,0)</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

**Content of Eosinophil Counts**

Table 4 shows that the distribution of eosinophil counts in the Chronic Rhinosinusitis with Nasal polyp group is more categorized as ++++ and +++ (40.0% and 30.0%) than those categorized as ++ and + (20.0% and 10.0%); whereas in the Chronic Rhinosinusitis without nasal polyp group is more categorized + and ++ (50.0% and 30.0%) than +++ and ++++ (15.0% and 5.0%); Chi-square test results showed significant differences (p <0.05).

**Table 4. Distribution of the category of eosinophil counts of Chronic Rhinosinusitis with Nasal polyps and without Nasal polyps groups**

<table>
<thead>
<tr>
<th>Group</th>
<th>Eosinophil Count</th>
<th></th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Nasal polyp (n=20)</td>
<td>2(10,0%)</td>
<td>4(20,0%)</td>
<td>6(30,0%)</td>
</tr>
<tr>
<td>Without Nasal polyp(n=20)</td>
<td>10(50,0%)</td>
<td>6(30,0%)</td>
<td>3(15,0%)</td>
</tr>
</tbody>
</table>
Graph 1. Comparison of IL-33 serum content between group of Nasal polyp and without Nasal polyp Box Plot

Graph 1 shows that mean content of IL-33 serum of group with chronic rhinosinusitis with nasal polyps are much lower than serum content of IL-33 serum of group with chronic rhinosinusitis without nasal polyps.

Tabel 5. Correlation between IL-33 content against eosinophils in chronic rhinosinusitis patients with nasal polyps

<table>
<thead>
<tr>
<th>Variable</th>
<th>Eosinophil Content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>IL-33 level</td>
<td>20</td>
</tr>
</tbody>
</table>

From table 5 shown that serum IL-33 content were positively correlated with eosinophil content. Although higher IL-33 content followed with higher eosinophil count but not significant correlation in the statistical. (p>0.05)

Tabel 6. Correlation between IL-33 content against eosinophils in chronic rhinosinusitis patients without nasal polyps

<table>
<thead>
<tr>
<th>Variable</th>
<th>Eosinophil Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>IL-33 level</td>
<td>20</td>
</tr>
</tbody>
</table>

From table 6 shown that serum IL-33 content was positively correlated with eosinophil content (r = 0.427; p = 0.030), meaning higher serum IL-33 content, the higher the eosinophil counts.

Discussion

In this study, samples were obtained between the ages of 20 and 40 years, with a mean of 30.40 years in chronic rhinosinusitis with nasal polyps, and 31.70 years in chronic rhinosinusitis without nasal polyps. This is in accordance with the research of Chen Y, et al., 2003 where the prevalence of chronic rhinosinusitis increases at age 20-29 years and 50-59 years.

The number of chronic rhinosinusitis patients with nasal polyps and without nasal polyps consisted of 15 men and 25 women. The distribution of sex and age in both groups of chronic rhinosinusitis patients may be considered homogeneous (p>0.05).

Based on the data in table 2 it was shown that the serum content of IL-33 serum with chronic rhinosinusitis were higher than controls; respectively for serum IL-33 (Median 788.50 vs. 154.71), and the result is significant (p <0.05). This is consistent with Ozturun et al., 2015 which found that serum IL-33 content in chronic rhinosinusitis with nasal polyps were higher than those in the control group. The influence of IL-33 on upper respiratory epithelium has an important role in chronic inflammation associated with chronic rhinosinusitis with nasal polyps by increasing the cytokine of Th2, which also mediates the occurrence of eosinophil infiltration.\textsuperscript{9,10}

Table 3 and graph 1 showed that serum IL-33 content were significantly higher (p <0.05) in patients with chronic rhinosinusitis without nasal polyps than with nasal polyps (median 859.65 vs 214.77). This is according to research by Smithgall MD, et al., 2008, that IL-33 if synergize with IL-12 can induce NK cells and cell iNKT which resulted in the release of inflammatory mediators IFN-γ which can release the release of neutrophils and cause inflammatory responses in chronic rhinosinusitis without nasal polyp.\textsuperscript{11}

Based on table 3 data, it shows that the number of eosinophils in nasal polyps was significantly higher (p <0.05) than without nasal polyps (median = 3.0 vs 2.0). In table 4 and graph 3 data also shows that the distribution of eosinophil counts in the nasal polyp group is more categorized as +4 and +3 (40.0% and 30.0%) than those categorized as +2 and +1 (20.0% and 10.0%); whereas in the group without nasal polyps is more categorized as +1 and +2 (50.0% and 30.0%) than +3 and +4 (15.0% and 5.0%); Chi-square test results shown significant differences (p <0.05).

The increasing of eosinophil in chronic rhinosinusitis with nasal polyps is also significantly consistent with Hulse KE, et al., 2015, which says that eosinophils are elevated in chronic rhinosinusitis with nasal...
polyps. Eosinophils will produce eosinophil cationic proteins that can cause epithelial cell damage, as well as proinflammatory molecules that contribute to type 2 inflammation, which is associated with the occurrence of nasal polyps.12

Based on Table 5 and Table 6 can be seen in both groups of chronic rhinosinusitis with nasal polyps and chronic non-nasal polyps rhinosinusitis, it was found that serum IL-33 content were positively correlated with eosinophil content. The higher the content of IL-33, the higher the eosinophil level but which is significant only in chronic rhinosinusitis without nasal polyps.

**Conclusion**

This study shown that IL-33 was higher content on chronic rhinosinusitis without nasal polyp, whereas IL-33 increases eosinophil content in chronic rhinosinusitis without nasal polyp, and the eosinophil was higher content on chronic rhinosinusitis with nasal polyp.

**Conflict of Interest :** There is no conflict of interest

**Source of Funding:** Researcher (Self)

**References**

Comparison of Breastmilk Production between Vaginal Delivery and Caesarean Section with Regional Anesthesia at Lombok 22 Hospital, Surabaya City, Indonesia

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¹Department of Maternal and Child Health, ²Department of Biostatistic and Demography, Faculty of Public Health, Airlangga University, ³Department of Pediatric, Faculty of Medicine, Airlangga University

Abstract

Breastfeeding is the one and only reliable nutritional source for baby. It is important that a mother ideally begins breastfeeding her newborn in the first hour after delivery. Actually, many factors could affect breastfeeding such as delivery type. The objective of this study was analyze and compare breast milk production between vaginal delivery and caesarean section with regional anaesthesia which has done Early Initiation of Breastfeeding (EIBF). The data used was primary data through filling questionnaires and interviews to subjects. This study was observational analytic with prospective cohort design. The population was all mothers who giving birth at Lombok 22 Hospital Surabaya and also has done EIBF. Sampling was simple random sampling and obtained 56 mothers into 2 groups. First group was 28 mothers who deliver by vaginal delivery. Second group was 28 mothers who deliver by caesarean section with regional anaesthesia. The result showed that there were a different breast milk production between vaginal delivery and caesarean section with regional anaesthesia (p<0.001). This study used postpartum pain as an intermediate variable. The result showed that there were a relationship between postpartum pain and breast milk production (p<0.001). Last, the result of multiple regression analysis showed that breast milk production was influenced by type of delivery (p=0.023; RR=8.047) and postpartum anxiety (p<0.001; RR=55.205).

Keywords: breast milk production; caesarean section with regional anaesthesia; postpartum anxiety; postpartum pain

Introduction

Breastfeeding is the one and only reliable nutritional source for baby. It is important that a mother ideally begins breastfeeding her newborn in the first hour after delivery. Breast milk is able to prevent disease and increase immunity in the baby’s body¹.

Actually, many factors could affect breastfeeding such as delivery type. Caesarean section is different from vaginal delivery. Vaginal delivery does not use anesthesia during labor, while caesarean section uses regional anesthesia around the abdomen during labor.

If the effect of regional anesthesia was lost, the mother would felt the pain around the incision wound c-section. It called postpartum pain. This pain makes the mother became worried about herself, so she just focused on her pain and her baby neglected. It called postpartum anxiety. So that, breast milk production was reduced²-³.

According to Grysztar’s Research, breastfeeding failures mostly in 45% mothers who deliver by caesarean section and 17% mothers who deliver by vaginal

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delivery. It is because anaesthesia can inhibit the release of oxytocin, thereby reducing milk production. In addition, postpartum pain and postpartum anxiety can also let down reflex because of epinephrine released. That causes vasoconstriction in the alveoli.

Early Initiation of Breastfeeding (EIBF) is a way to improve breastfeeding success. Skin-to-skin contact has been suggested to improve sucking ability, improve infant receptivity, and sufficient milk supply.

The objective of this study was analyze and compare breast milk production between vaginal delivery and caesarean section with regional anaesthesia which has done Early Initiation of Breastfeeding (EIBF).

**Materials and Method**

This study was observational analytic with prospective cohort design. The population was all mothers which giving birth at Lombok 22 Hospital, Surabaya City, Indonesia and also has done EIBF. Sampling was simple random sampling and obtained 56 mothers divided into 2 groups. First group was 28 mothers who deliver by vaginal delivery, as a control group. Second group was 28 mothers who deliver by caesarean section with regional anesthesia.

Inclusion criteria of this study were: single baby, no congenital abnormalities, newborn with birth weight more than 2500 grams, and gestational age 37-42 weeks. This study used primary data through filling questionnaires and structured interviews to subjects. All of the questionnaires were calculated by the validity and reliability test. The independent variables were type of delivery, postpartum pain, and postpartum anxiety. The dependent variable was breast milk production which was measured on day 1 and 2.

SPSS Statistics 17.0 was used for data analysis. Bivariate analysis were compared using cross-tabulations and Chi-Square Test with $\alpha = 0.05$. A multivariable logistic regression model was created to examine the causal association between independent variables and breast milk production using Multiple Logistic Regression with $\alpha = 0.05$.

**Findings**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Breast Milk Production</th>
<th>Total</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less for baby</td>
<td>Enough for baby</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Type of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-Section delivery</td>
<td>20</td>
<td>76.9</td>
<td>8</td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>6</td>
<td>23.1</td>
<td>22</td>
</tr>
<tr>
<td>Postpartum pain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>12</td>
<td>46.2</td>
<td>2</td>
</tr>
<tr>
<td>Moderate</td>
<td>13</td>
<td>50.0</td>
<td>4</td>
</tr>
<tr>
<td>Mild</td>
<td>1</td>
<td>3.8</td>
<td>19</td>
</tr>
<tr>
<td>No pain</td>
<td>0</td>
<td>0.0</td>
<td>5</td>
</tr>
<tr>
<td>Postpartum anxiety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>24</td>
<td>92.3</td>
<td>5</td>
</tr>
<tr>
<td>Not anxious</td>
<td>2</td>
<td>7.7</td>
<td>25</td>
</tr>
</tbody>
</table>

* Significantly different using Chi-Square Test (p < 0.05)
Table 2. Summary of multiple logistic regression

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>p</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-Section delivery with regional anaesthesia</td>
<td>2.085</td>
<td>0.916</td>
<td>0.023*</td>
<td>8.047</td>
</tr>
<tr>
<td>Vaginal delivery (reference group)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postpartum anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>4.011</td>
<td>0.975</td>
<td>&lt; 0.001*</td>
<td>55.205</td>
</tr>
<tr>
<td>Not anxious (reference group)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significantly correlate using Multiple Logistic Regression Test (p < 0.05)

There was a different production of breast milk between vaginal delivery and caesarean section delivery with anaesthesia regional (p < 0.05), is shown in Table 1. Most of mothers who had C-Section delivery with regional anaesthesia (76.9%) were able to produce breast milk less than vaginal delivery. In contrast, most of mothers who had vaginal delivery (73.3%) were able to produce breast milk more enough than C-Section with regional anaesthesia. It could be concluded that the adequacy of breast milk production was more experienced by mother who had vaginal delivery.

Table 1 shows that there was a correlation between postpartum pain and production of breast milk (p < 0.05). Most of mothers who felt severe pain (46.2%) and moderate pain (50.0%) were able to produce breast milk less than mothers who felt mild pain even did not pain at all (3.8%). In contrast, most of mothers who felt mild pain (63.3%) and did not pain at all (16.7%) were able to produce breast milk more enough than mothers who felt moderate pain (13.3%) and severe pain (6.7%).

Table 1 also shows that there was a correlation between postpartum anxiety and production of breast milk (p < 0.05). Most of mothers who felt anxious (92.3%) were able to produce breast milk less than mothers who did not anxious (7.7%). In contrast, most of mothers who did not anxious (83.3%) were able to produce breast milk more enough than mothers who felt anxious (16.7%). It could be concluded that the adequacy of breast milk production was more experienced by mother who did not anxious.

Table 2 shows that the results of multivariate analysis with Multiple Logistic Regression Test (α = 0.05). The result showed that breast milk production was influenced by type of delivery (p=0.023; RR=8.047) and postpartum anxiety (p<0.001; RR=55.205). The mothers who had caesarean section delivery with regional anaesthesia were at risk for produce not enough breast milk 8.047 times greater than mothers who had vaginal delivery. Then, mothers who felt anxious were at risk for produce not enough breast milk 55.205 times greater than mothers who did not anxious.

So that, postpartum anxiety most likely has an influence to breast milk production.

Discussion

Following approval from the institutional ethical committee, written informed consent from 56 respondents was obtained. The independent variables of this study were type of delivery, postpartum pain, and postpartum anxiety.

The first independent variable of this study was type of delivery. The result shows that the mothers who had caesarean section delivery with regional anaesthesia were at risk for produce not enough breast milk 8.047 times greater than mothers who had vaginal delivery. In other word, the production of breast milk transferred to baby born by caesarean section with regional anaesthesia is less than that transferred to baby born by vaginal delivery over the first and second days of life. Not only statistically significant in this study, but also in two studies had done before.

Studies said that caesarean section delivery might inhibit the success of breastfeeding because of the condition of the mother due to anaesthesia\(^{2,13}\). Although early initiation of breastfeeding (EIBF) has been done, the mother still weak and her mobility was limited. Most
of them just lying on the bed for 36-48 hours first.

During the in-depth interview, the mothers who had vaginal delivery looked more able to move actively than the mothers who had caesarean section delivery with regional anaesthesia. They were able to walk to the bathroom with or without the help of a nurse. They were also able to hold and hug their babies closely anytime to breastfed their babies. It caused the production of breast milk greater.

The second independent variable of this study was postpartum pain. The result shows that there was a correlation between postpartum pain and production of breast milk. Not only statistically significant in this study, but also in two studies had done before. Studies said that postpartum pain could inhibit the production of oxytocin. It was a hormone that affect the flow of breast milk. In addition, postpartum pain and postpartum anxiety also let down reflex because of epinephrine released. It caused vaso-constriction in the alveoli.

During the in-depth interview, the mothers who felt mild pain even did not pain at all could produce more enough milk than moderate and severe pain as much as 5-20 ml. Therefore, health services should provide some programs to reduce postpartum pain levels, such as prenatal yoga.

The third independent variable of this study was postpartum anxiety. Postpartum anxiety is closely related to postpartum pain. The result shows that the mothers who felt anxious were at risk for produce not enough breast milk 55.205 times greater than mothers who did not anxious. Nurliawati and Saraung also said that postpartum anxiety most likely affected the production of breast milk.

During the in-depth interview, they said that their babies were still crying louder even though it has been breastfed. Most of her families suggested to giving formula milk to her baby as a temporary substitute when their breast milk was low. It was a wrong solution, because actually breastfed process could improve sucking ability, improve infant receptivity, and then breast milk supply would greater.

Most of the mothers also said that they did not know what should they do, follow their families’ advice or still breastfeeding their babies patiently. Therefore, health services should provide some programs to reduce postpartum anxiety, such as giving education on how to relax, regulate breathing, and closer to their Lord.

**Conclusion**

The breast milk production was influenced by type of delivery and postpartum anxiety. Based on its conclusion, it is suggested to Health Service Centre to giving some programs to pregnant mother, especially in the selection of delivery types and how to enjoy their new life after baby birth. It is also suggested to society to keep supporting the mothers for breastfed.

**Conflict of Interest:** There was no conflict of interest in this study.

**Ethical Clearance:** This study was received ethical approval from the Health Research Ethics Committee, Faculty of Public Health, Airlangga University.

**Source of Funding:** This study was supported by the authors.

**References**

Evaluation on Heavy Metals and Microbiological Contamination in Instant Papeda with Laor Koya (Polychaeta) as Supplementary Food for Pregnant Woman

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Abstract

Background. Having a safe meal is the human right. In fact, heavy metals and natural pathogenic microorganisms often contaminate the food people consume. Heavy metals and harmful microorganisms could ease the disease transmission with the food as the media.

Aim. This study aims to evaluate some of the heavy metals and microbiological contaminants on the formula of instant papeda enriched with laor (Polychaeta).

Method. Laor (Polychaeta) is substituted to Skipjack Tuna with a ratio of 100% : 0% (PI); 80% : 20% (PIKL1); 70% : 30% (PIKL 2) and 60% : 40% (PIKL 3). Atomic Absorption Spectrophotometry (AAS) was used to determine metal contamination. Total Plate Count (TPC) was used to determine the contamination numbers of total plate count. Most Probable Number (MPN) method determined Coliform. Isolation and identification method were used to determine Escherichia coli, Salmonella, and Staphylococcus aureus. One Way Anova test. Confidence Interval (CI) 95% was used to discover statistical analysis for metal contamination. Microbial contamination is descriptively analyzed.

Results. Substances level found in instant papeda with laor koya are as follows: Pb (Lead), the lowest level: 0.0106 mg/kg, the highest level: 0.0119 mg/kg. Cu (Copper), the lowest level: 0.0037 mg/kg, the highest level: 0.0075 mg/kg. Sn (Tin), the lowest level: 0.0062 mg/kg, the highest level: 0.0087 mg/kg. Hg (Mercury), the lowest level: 0.0015 mg/kg, the highest level: 0.0017 mg/kg. Total microbial contamination is 0 colony/mL. MPN coliform states 0 colony/mL, Staphylococcus aureus is 0 colony/mL, Escherichia coli and Salmonella shows negative result.

Conclusion. The metal emission does not exceed the maximum limit stated in Indonesian National Standard (INS) or Standard Nasional Indonesia (SNI) and Codex and there is no microbiological contaminant found in instant papeda with laor koya.

Keywords: Papeda, laor, heavy metals, microbiological contamination

Introduction

Papeda, a traditional food from East Indonesia made of sago, is usually consumed with skipjack tuna and yellow sauce. Laor, one of the typical biota which is swarming – an activity when a certain type of abundant sea worms abound around the water surface on a full moon for an external fertilization1 in March or April, demanded by the inhabitants of Maluku, Indonesia. Furthermore, the additional meal as the alternative for the expectants often use laor substitution served together with instant papeda.

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According to Codex Alimentarius, some substances could contaminate the food processing, as in manufacturing, handling, storing and processing or even distributing activity since contaminants could be found from the surrounding. To avoid contamination and unsafe meals, the presence of these substances should be monitored carefully so the quality of the meal will not be affected. Moreover, heavy metals and harmful microorganisms could ease the disease transmission with the food as the media (2).

Heavy metals, both metalloids and chemical metallic with high atomic mass numbers and density are toxic to living things. During food processing, both metal contaminants from the food itself and contaminants from surroundings would expose the food (3). Heavy metals contamination is a serious threat in a food chain due to their toxicity, bioaccumulation and bio magnification (4).

Having a safe meal is the human rights. In fact, heavy metals and natural pathogenic microorganisms often contaminate the food people consume. On the other hand, such pathogens are harmful, causing various diseases with various severity, even bringing death while those cannot be detected organoleptically (visibly or noticeably). Consequently, when those pathogens are preserved and conditioned during an exposition for sale, the microorganism will grow and reach substantial levels of contamination (5).

One of the major public health issues encountered by developing countries is food borne diseases caused by microbiological agents (6). It is an important issue in public health due to the rapid and deadly infection (7) (8) especially the incidence of food poisoning arisen all over the world.

The objective of the study is to evaluate some of the heavy metals and microbiological contaminants on the formula of instant papeda enriched with laor (Polychaeta).

**Materials and Method**

Formulation of instant papeda with laor koya (Polychaeta) used the experimental design RAL (Completely Randomized Design) consisting of four treatments and four repetitions. The materials used were skipjack tuna fish and laor (Polychaeta). Previously, the materials were examined to check the proximate assessing and metal contamination in the Laboratory of Nutrition, Department of Nutrition, Faculty of Public Health, Airlangga University, Surabaya. Laor (Polychaeta) was formulated as koya by washing, drying in a temperature of 60°C for 12 hours, roasting, grinding and sifting. The skipjack tuna with yellow sauce was produced by cutting the fish into pieces, cleaning, boiling with the spices, and then pasteurizing and sterilizing.

The instant papeda with laor koya was produced by mixing sago with 60 ml of boiled water while stirring, then adding slowly 450 ml of boiled water while stirring to form Papeda porridge and setting aside. After that, 200 ml of water was boiled and added by the skipjack tuna along with the ingredients, simmer for 3 minutes. Then the fish with yellow sauce was served with papeda porridge and sprinkled by the laor koya.

Atomic Absorption Spectrophotometry (AAS) was used to determine the metal contamination and Total Plate Count (TPC) was used to determine the contamination numbers of total plate count. Most Probable Number (MPN) method determined Coliform. Isolation and identification method were used to determine Escherichia coli, Salmonella, and Staphylococcus aureus. One Way Anova test with Confidence Interval (CI) 95% was used to discover statistical analysis for metal contamination. Microbiological contamination was descriptively analyzed.

**Results**

Papeda, a traditional food from East Indonesia made of sago that is usually consumed with skipjack tuna and yellow sauce. To increase the nutrients, papeda is now developed by the addition of laor flour (Polychaeta). Furthermore, foodstuffs used should be clean, safe, high-quality and appropriate for the expectants (9)(10).

**Heavy Metals Contaminants Found in the Formula of Instant Papeda with Laor koya**
The content of metal contaminants in instant *papeda* does not exceed the safety limit appointed. Lead contaminants among those four formulas was found to be 0, 0106-0, 0119 mg/kg, while the maximum limit of lead contaminants according to Codex Stand 72-1981 was of 0.02 mg/kg (11), moreover the maximum standard based on Indonesian National Standard (INS) or *Standard Nasional Indonesia* (SNI) equals to 0.3 mg/kg. Furthermore, the statistical analysis states that there was no significant difference among the formulas of those four instant *papeda*.

Pb (Lead) contamination found at Ambon waters has not exceeded the limit or remains within normal limits, averaged out less than 0.004 mg/L (12). Lead is the most systemic toxic affected several organs in human body including the kidneys, liver, central nervous system, hematopoietic system, endocrine system, and reproductive system. Several studies stated when lead is absorbed by or exposed to the pregnant women, there will be possibility for low birth weight and premature birth, as well as abnormal developmental of nerves, since lead will be transferred to the fetus (13).

Means results of metal contaminants found in all four *papeda* formulas were as follows: Cu (Copper), 0.0037-0.0075 mg/kg; the maximum limit found in the special diet for the pregnant women, 20 mg/kg. Sn (Tin), 0.0062-0.0087 mg/kg; the maximum limit, 40 mg/kg. Hg (Mercury), 0.0015-0.0017 mg/kg; the maximum limit, 0.03 mg/kg. There was no significant difference among the formulas of those four instant *papeda* based on the statistical analysis results.

### Microbiological Contamination in Instant *Papeda* with *Laor koya*

#### Table 2. Mean Microbiological Contamination in Instant *Papeda* with *Laor koya*

<table>
<thead>
<tr>
<th>Microbiological Contamination</th>
<th>Formula</th>
<th>PI</th>
<th>PIKL1</th>
<th>PIKL 2</th>
<th>PIKL 3</th>
<th>Recommended Reference Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Plate Count</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Maximum $5 \times 10^4$ Colony/g (mL)</td>
</tr>
<tr>
<td>MPN Coliform</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Maximum $1 \times 10^2$ Colony/g (mL)</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td></td>
<td>negative</td>
<td>Negative</td>
<td>Negative</td>
<td>negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Salmonella</td>
<td></td>
<td>negative</td>
<td>Negative</td>
<td>Negative</td>
<td>negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Maximum $1 \times 10^2$ Colony/g (mL)</td>
</tr>
</tbody>
</table>
PIKL 1           : Instant Papeda with Laor koya 1
( 80: 20%)

PIKL 2           : Instant Papeda with Laor koya 2
(70: 30%)

PIKL 3           : Instant Papeda with Laor koya 3
( 60: 40%)

The formulas of instant papeda, PI (100: 0%), PIKL1 (80: 20%), PIKL2 (70: 30%) and PIKL3 (60: 40%), meet the quality requirements based on INS 01-7148-2005 on microbial contamination in special food of pregnant women. Results on microbial contamination found in instant papeda with laor koya were as follows: the total microbial plate found was 0 and the maximum number was $5 \times 10^4$ Colonies/g (mL). The number of MPN coliform was 0 and the maximum number was $1 \times 10^2$ Colonies/g (mL). There was no Escherichia Coli and Salmonella contamination, based on test results. There was no Staphylococcus aureus contamination found while the maximum number was $1 \times 10^2$ Colonies/g (mL).

The International Commission on Microbiological Specifications for Food (ICMSF) accepts the total aerobic plate count, the amount of Staphylococcus aureus, and the amount of Escherichia coli on cooked ready-to-eat foods between 0 – 103, while 104 – 105 is tolerable and more than 106 is unacceptable. A research by Henry et al., (2017) on those requirements resulted higher numbers than the reference.

Generally the low-acid meals such as meat, eggs, fish and other dairy products are the source of infection and poisoned by bacteria. Fresh fish are frequently contaminated by some bacteria such as Salmonella sp., Shigella, Escherichia coli, Enterococci and Clostridium. Escherichia coli is one of the bacteria that easily spread by contaminated water and ingredients with direct contact.

The hygienic process in preparing and processing meal is the key to avoid microbiological contamination. To promote a product, the guarantee of microbial quality and free pathogenic microorganisms is highly essential to ensure the consumers in consuming the products.

**Conclusion**

Summarily, instant Papeda with laor koya meets the quality requirements formulated by codex and Indonesian National Standard (INS) or Standard Nasional Indonesia (SNI) as the maximum limit of heavy metals contamination was not exceeded and was not polluted by microbes.

**Conflict of Interest:** There is no conflict of interest for both authors.

**Source of Funding** This research funded by Ministry of Health Republic Indonesia.

**Ethical Clearance:** All procedures performed in studies were in accordance with the ethical standards of Animal Care and Use Committee Faculty of veterinary medicine Airlangga University number 762.

**Informed Consent:** No human participants included in the research. No informed consent needed.

**References**


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Capacity Building in Health Worker as an Alternative Solution to Solve Stunting Problem

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Abstract

Stunting is a public health issue that is the topic of world nutrition. The country of Indonesia is ranked fifth in the world with a short-term prevalence of 30-40%. The incidence of stunting in East Java amounted to 26.1% in 2015 occurred in the area of Surabaya City of 19.3%. This study aims to examine the problem of stunting, identify the cause factors, and provide an alternative solution to solve the problem of stunting in the work area of Puskesmas Tanah Kali Kedinding Surabaya. The study was conducted in April-May 2018. Primary data was obtained through indept interview on nutrition officer. The results showed that the intervention of stunting case in Puskesmas Tanah Kali Kedinding had not been done due to lack of knowledge and understanding of all officers regarding prevention and handling of stunting. The CARL method is used to get the most prioritized solution possible. The solution is to conduct capacity building on the prevention and handling of stunting at all Puskesmas officers. Thus all Puskesmas officers are able to implement the stunting intervention program in their working area.

Keyword: stunting, capacity building, health planning program.

Introduction

Stunting describes the chronic underweight status of growth from early life. The stunting state was presented with a standard z-score of height by age less than -2 standard deviation[1]. Stunted children closely related to conditions that occur over a long period of time such as poverty, poor hygiene and environmental health, poor parenting and low levels of parental education.

Cohort study of child growth in Bogor City by Agency of Health Research and Development, Indonesia Health Ministry in 2013 has successfully followed 220 mothers giving birth and monitored until their babies was 15 months. The results state that the growth of stunted babies is always left behind compared to normal babies. Studies shown other results that stunted babies may become normal when intervened appropriately. Conversely, a normal babies can also be stunting if with wrong parenting pattern[2].

Stunting problems in children can inhibit child growth and cause negative impacts such as intellectual decline, decreased productivity resulting in poverty and the risk of delivering low birth-weight infants[3][4]. Globally, about 1 in 4 children suffer from stunting[4]. Based on the Nutrition Status Monitoring survey results from 2014-2016, the percentage of stunting cases 0-59 months in East Java in 2014 by 29%. The number decreased to 27% in 2015 and 26.1% in 2016[5]. However, the decrease in stunting cases was not significant because the prevalence of stunted children would be a public health problem in 20% or more[1].

The prevalence of stunting in toddlers in Surabaya 2014 is 21.5%. Puskesmas Tanah Kali Kedinding is a puskesmas with stunting prevalence of 20.83% in 2012. Stunting cases increased to 21.86% in 2013 and 25.69% in 2014[6]. The incidence of stunting continues to occur in 2017. There were 105 children under five are stunted than 3,798 children (2.76%). Although the presentation seems to be declining from previous years but the absolute number is still high.

This study aims to examine the problem of stunting and stunting factors in the working area of Puskesmas Tanah Kali Kedinding Surabaya. This is done to provide a possible solution to solve of stunting issue.
Material and Method

The research was conducted by observational approach, using quantitative and qualitative data, and it was conducted at Puskesmas Tanah Kali Kedinding Surabaya in April-May 2018. Primary data was obtained through indepth interview to 2 nutrition officers of Puskesmas, which was a research informant. The data obtained were analyzed descriptively. The activity begins by analyzing the situation, determining the priority of the problem, identifying the cause of the problem, and prioritizing the solution.[7]

Situation analysis to determine the organization’s position is done by using SWOT. SWOT analysis is a strategic planning method used to evaluate strengths, weaknesses, opportunities and threats within an organization. The SWOT analysis guides to identify the positive and negative sides of the organization’s internal (S-W) and external organizational (O-T) conditions. Identify the cause of the stunting problem obtained by using fishbone. Fishbone is a tool that describes a systematic way to identify causes of a particular impact.

Priority problem and solution determination using USG (Urgency, Seriousness, Growth) and CARL (Capability, Accessability, Readiness, Leverage) methods. The USG method is one of the tools for compiling the priority sequence of problems to be solved. USG is done by determining the level of urgency, seriousness, and the growth of issues by determining the scale of values 1-5. The problem with the highest total score is a priority issue to be resolved soon. CARL is one of the tools to determine the priority of alternative health problem solutions[7]. CARL method is done by determining the score based on certain criteria, namely capability, accessability, readiness and leverage. An alternative solution that has the highest score is the most likely solution to run. The CARL method is used if the program implementer still has limitations in solving the problem. The use of this method emphasizes the ability of program implementers[7].

Findings

Overview of Nutrition Program

Puskesmas Tanah Kali Kedinding Surabaya is a primary health care which located in northern part of Surabaya. The location is near to the coast of Nambangan so the availability of high protein food is fulfilled. There are 2 nutrition officers at Puskesmas Tanah Kali Kedinding. The type and number of health staff in the Puskesmas in accordance with Ministry of Health Regulation No. 75 in 2014 that there is at least 1 nutrition officer for urban Puskesmas[8]. While the service program efforts to improve the nutritional status of the community that has been done, among others:

- Posyandu Program for toddlers
- Counseling of supplementary feeding for infants and toddlers
- Supplementary feeding for pregnant with chronic energy deficiency
- Supplementary feeding for malnourished infants and toddlers nutrition assistance
- Screening for toddlers malnutrition
- Family conscious of nutrition program
- Provision of vitamin A and iodized salt for children
- Provision of Fe tablets for pregnant and young women

Based on the program that has been done, there is no special program to solve the stunting problem. Stunting events are always encountered at the time of screening, however the discovery of stunting cases has never been acted upon.

Organizational Internal Condition and Situation Analysis

Base on SWOT analysis, it is found that the position of the organization is in quadrant 4. The picture shows that Puskesmas have weaknesses from internal organization and strong threat from external organization. The weakness of organization is derived from human resources factors both quantity and quality, and poor coordination among work units in running health programs. While the threat from external organizations is the lack of public knowledge about stunting and there is no follow-up stunting program from Surabaya Health Office.
Stunting situation analysis has been done and found that there are some problems related to stunting in terms of officer, community, and environment. Some of the problems that have been found are impossible to solve simultaneously because Puskesmas have resources limitation. It becomes the reason that necessary to prioritize the problem to determine which problems can be solved first. Determining the priority of the problem is done using USG method by considering the urgency, seriousness, and risk of growth level of the problem.

Table 1. Determination of Stunting Problem Problems with USG Methods

<table>
<thead>
<tr>
<th>No</th>
<th>Issues</th>
<th>U</th>
<th>S</th>
<th>G</th>
<th>Total</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lack of public knowledge about the program stunting.</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>No follow-up policy on stunting program of Surabaya City Health Department and Head of Puskesmas.</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>48</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Child body length measurement inaccuracies due to limited cadres and facilities.</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Lack of knowledge and understanding of nutrition officers about stunting.</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>80</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>No intervention of stunting cases (priority of nutrition officers only on the handling of malnutrition).</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Stunting program policies have not been socialized to nutrition workers.</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Puskesmas just screened two times a year, never do counseling about stunting to the public.</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Breaking up of child nutrition monitoring at age &gt; 5 years old child of early childhood.</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Screening is not performed on children aged &gt; 5 years so that the incidence of stunting at that age is not detected.</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>36</td>
<td>6</td>
</tr>
</tbody>
</table>
The priority result of the problem to be addressed is related to the absence of intervention to the stunting case (priority of nutrition officers only on the handling of malnutrition).

Determinant of Issues and Alternative Solutions

We identify the cause of the problem after deciding priority issues. Identification is done by using fishbone approach. Based on the approach, the root of the problem associated with the absence of intervention to the stunting case is because the Puskesmas staff does not have sufficient ability and knowledge about stunting and how to intervene. So alternative solutions that could be done is to carry out capacity building on the prevention and control in all Puskesmas staff. Selection of alternative solutions is done by using the CARL method with regard to capability, accessibility, readiness and leverage of proposed solutions.

Table 2. Results of Alternative Solution Determination by Using CARL Method

<table>
<thead>
<tr>
<th>No</th>
<th>Alternative of Solution</th>
<th>C</th>
<th>A</th>
<th>R</th>
<th>L</th>
<th>Total</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conducting capacity building for all officers related to prevention and stunting prevention.</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>240</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Empowerment of cadres.</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Make proposed follow-up of stunting program policy to Surabaya City Health Office.</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>72</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Conducting community capacity building to improve understanding of stunting.</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>54</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Establish coordination system between work units at Puskesmas.</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>128</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Make planning of stunting program implementation.</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>Create a stunting prevention strategy.</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>36</td>
<td>6</td>
</tr>
</tbody>
</table>

Based on the cause problem identification, the most appropriate solution is capacity building about stunting. Some of the things that can be done when building capacity are:

Improving understanding of officers related stunting (factors causing and how to prevent & handling)

Increase knowledge and understanding of stunting policy from Surabaya City Health Office and Indonesian government

Improving the ability to implement an integrated stunting intervention program at the Puskesmas

Discussion

There are several studies that have been done in Indonesia found that stunting is associated with factors that cause maternal nutritional status during pregnancy (age, parity, BMI, upper arm circumference, psychology and social condition). Causes of stunting from family and environmental conditions can lead to infection in children and decrease the nutritional status of children[9]. Another determinant of stunting is behavioral factors that are inconsistent with the suggestion of healthy behavior, family economic status, and parental education status[10]. So some solutions to stunting solutions are mostly focused on handling them.

Based on the situation analysis of stunting problem in this research, the main factor causing the stunting situation actually comes from health service factor. As in Hendrik L. Blum’s theory that health care providers have contributed to the incidence of health problem. In line with Trihono’s research results in 2015 that the determinants of stunting causes are derived from health services and the success of intervention programs lies in the ability of health workers to implement stunting prevention programs[10].
The stunting problem that must be handled in Puskesmas Tanah Kali Kediniding Surabaya is related to the absence of any intervention in the stunting case. The identification result of problem is the lack of ability from nutrition officer in identifying stunting problem. Nutrition officer not understand how to determine the value of z-score, causes stunting, and how to handle stunting. The First 1000 Day Life Program (Scalling Up of Nutrition program in Indonesia) has not been integrated in prevention and stunting programs. Thus it can be concluded that the stunting program has not been well socialized by the Surabaya City Health Office so that the implementation has not been effective in Puskesmas Tanah Kali Kediniding.

Based on the research results found that capacity building is the solution of the stunting problem that occurred in the Puskesmas Tanah Kali Kediniding Surabaya. Capacity building activities undertaken at all Puskesmas officers are expected to improve their ability in identifying causes of stunting, prevention and handling of stunting problems.

The selection of the solution is in accordance with the Stunting Summary Book compiled by the National Team for Accelerating Poverty Alleviation 2017, that there are several possible causes of the ineffectiveness of the stunting intervention policy and program\textsuperscript{11}. Causal factors are among others:

- Policies and regulations regarding stunting intervention have not been used as a common ground for handling stunting.
- Ministries/institutions implement programs according to their responsibilities without good coordination among institutions.
- The planned stunting intervention programs have not been fully implemented.
- Existing programs/interventions still require improvements in program design, coverage, quality and objectives.
- Nutrition knowledge improvement program and healthy life behavior change has not been done.
- Community-based programs are not implemented maximally;
- The knowledge and capacity of both central and local governments in handling stunting need to be improved.

To strengthen human capacity to deliver priority nutrition interventions at scale, a country needs to develop a workforce strategy that uses evidence-based systematic approaches to produce sufficient numbers of skilled workers with the needed technical competencies in nutrition\textsuperscript{12}. This requires clearly defining the challenges and gaps in nutrition competencies and training, followed by the strategic scaling up of proficient nutrition competencies within various public service cadres. Without specific articulation of the nutrition competencies that are required of people working in this field, workforce development and continuing professional development will be inefficient\textsuperscript{13}.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure2.png}
\caption{Strengthening Human Capacity Strategy to Implement Priority Nutrition}
\end{figure}
**Intervention at Scale**

Based on the previous study, the problem solving of stunting should not only focus on determining the cause of stunting from community but also the capacity of the implementing resources of the intervention program, specifically all of health workers in the Puskesmas. Without adequate capacity in terms of program implementers then the program will not be possible to run well and the program objectives will not be achieved.

**Conclusion**

The problem of stunting at Puskesmas Tanah Kali Kedinding Surabaya is no longer caused due to the nutritional status of pregnancy, family economic condition, environmental condition, but due to internal factors of Puskesmas. Based on the result of identification of cause of stunting problem which continuously happened is because have not implemented intervention in stunting case. This is due to the limited ability of health workers at the Puskesmas as the program implementer. So that the improvement of the ability of health workers about prevention and handling stunting can be used as an alternative solution to the settlement of the case.

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**Ethical Clearance:** This manuscript describes original work and is not under consideration by any other journal. All authors approved the manuscript and this submission. We maintain the confidentiality of the research data. The data collected has received approval from the research informan by completing the informed consent research form.

**References**

Preparing Fit and Healthy Pilgrims in order to be able to Perform Hajj Optimally through Health Policy in Indonesia

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Abstract

Indonesia hajj health program aimed at enhancing and maintaining health and fitness of pilgrims as stipulated in national policy on hajj health management. However, the unavailability of funding sources becomes a main constraint for executing the policy. The MOH awarded Lumajang as the most outstanding district on hajj health management in 2014. Lumajang was able to allocate hajj health program in the annual regional budget. The objective of this study was to analyze the implementation of hajj health policy from the point of equity, efficiency, quality, and community empowerment in order to improve health status and physical fitness level of all hajj pilgrims in Lumajang. This research applied descriptive study and documentary review using original data on health policy implementation. The population of study were 710 pilgrims (jemaah). Most jemaah were 45-60 years old and 52% were men. The results revealed that most jemaah had high blood pressure (57,31%), some improvements in all BMI categories, and category of fair in physical fitness (49,31%). Moreover, there was zero death of 710 jemaah, in which 34 % of the total jemaah classified as a high health risk group. This study concluded that the policy implementation evidently could provide important benefit for hajj pilgrims of Lumajang in performing hajj ceremony process. The sustainability of hajj health program absolutely affected by the availability of funding sources, accessibility of health services, and support of community participation.

Key words: hajj pilgrims, health policy, physical fitness

Introduction

Hajj pilgrimage is one of the five fundamental pillars of Islam and becomes a mandatory for every moslem to perform it once in lifetime. Every year Indonesian pilgrims (jemaah) recorded as the largest in the world with approximately 210,000 people. They assemble in Saudi Arabia (SA) along with more than 3 million pilgrims from around 150 countries. The most of Indonesian jemaah classified as high risk pilgrims with age of 60 years and or have at least one health problem. The quantity of high-risk group tends to increase every year and still leads to the major health problem of Indonesian jemaah. Based on the Ministry of Health (MOH) data, number of high-risk pilgrims has risen from 50.6% (2011) and 46.6% (2012) to 56.19% in 2013. The study of Gaffar et al revealed that risk factors play a very significant role to death cases of jemaah. In the recent 10 years, death rate of Indonesia jemaah during hajj pilgrimage in SA reached 2.1 to 3.2 per 1000 jemaah. This figure indicated a 2-3 fold greater than death rate in Indonesia during a normal circumstance. Two types of disease categorized as the cause of death of jemaah are cardiovascular (50%) and respiratory diseases (24%).

One of successful indicators of Hajj Health Program (HHP) includes declining morbidity and mortality rates. Also, jemaah should be able to maintain and improve their health independently and cope with any health problem by themselves. According to Law no. 13 in 2008 regarding Hajj Pilgrims Management, government has obligation and responsibility in providing hajj...
services and jemaah protection. Derivative of this Law has been realized through the MOH’s regulation no. 442 in 2009 regarding Guidelines on Management of Indonesia HHP. This national policy defined the objectives of HHP, namely to improve jemaah health and enhance jemaah physical fitness prior to leaving for SA. This is consistent with the statement of Singka that health status of jemaah before leaving needs to be prepared so that jemaah could achieve optimal health condition. Also, Fertini confirmed that adequate health condition is urgently needed by jemaah since the hajj pilgrimage involves a very heavy physical activity.

In order for the national policy could achieve its objectives, the actors of HHP then become the responsibility of Regional Government and District Health Office (DHO). In general, HHP at DHO consists of health screening and health promotion. Both of components are very essential to establish healthy jemaah.

This study aims to analyze the implementation of hajj health policy from the point of equity, efficiency, quality, and community empowerment, particularly in protecting the high-risk group and increasing health and physical fitness levels for all jemaah in Lumajang. The study selected Lumajang district as a good example of health policy implementation. The context of policy issue raised is closely related to several factors that affect the implementation of the policy. The evidence suggests there are many districts do not implement the MOH’s regulation. DHO is currently facing budget constraints in which the budget for HHP has not included yet in the annualy regular regional budget. As a result, the development of HHP has not been run in accordance with the existing guidelines. In other words, the implementation of HHP conducted by districts are often not in line with the health policy issued by central government.

Method

This research applied descriptive study and documentary review using original data on health policy implementation. Four main types of data complied from this study, including the percentage of blood pressure, body mass index (BMI) and physical fitness, and to analyze the implementation of HHP in Lumajang. Level of jemaah’s physical fitness were measured by using a walking test of Rockport method. Population of study were 710 Lumajang jemaah who performed hajj pilgrimage in 2014. The study conducted in Jakarta from October to December 2015. The study used secondary data of blood pressure, body mass index (BMI) and physical fitness derived from the 2014 Lumajang HHP reports in 2014 and the 2011-2013 Profile of Hajj Health. Additional data were obtained from the results of literature review and discussions with Lumajang HHP managers. Data were analyzed quantitatively to obtain frequency distribution of blood pressure, BMI and physical fitness. Discussion focused on hajj health issue, then associated with the implications of HHP and the results of its implementation in the study area. Method of analysis and discussion was based on the analysis of policy implementation developed by the WHO to examine the extent to which the DHO office has taken up such a role. Indicators of analysis include equity, efficiency, quality, and community empowerment.

Results

Subject Characteristics and Outcomes

The proportion of sex includes men 52% and women 48%. The age group shows the variation of age group < 19 years = 0,32 %; 19-44 years = 32,79%; 45-59 years = 43,02%; and ≥ 60 years = 23,86. Measurement of blood pressure, BMI, and physical fitness level of Lumajang jemaah conducted twice, namely in the period of 6 months and 3 months before departure.

Most jemaah have high blood pressure as shown in Table 1. The result of health education and physical exercise program, which was conducted for 3 months, showed a decrease in blood pressure levels of jemaah from 59.43% to 57.31%.

<table>
<thead>
<tr>
<th>Category</th>
<th>6 mon</th>
<th>3 mon</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>59,43</td>
<td>57,31</td>
</tr>
<tr>
<td>Normal</td>
<td>36,2</td>
<td>38,47</td>
</tr>
<tr>
<td>Low</td>
<td>4,38</td>
<td>4,22</td>
</tr>
</tbody>
</table>

Nutrition status of jemaah measured by BMI. Table 2 indicates results of health education and physical exercise after 3 months. It shows improvement in all categories of BMI in all nutrition status.
Table 2. Body Mass Index Level

<table>
<thead>
<tr>
<th>Category</th>
<th>6 mon</th>
<th>3 mon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very thin</td>
<td>5.05</td>
<td>4.87</td>
</tr>
<tr>
<td>Thin</td>
<td>12.46</td>
<td>12.01</td>
</tr>
<tr>
<td>Normal</td>
<td>31.31</td>
<td>33.77</td>
</tr>
<tr>
<td>Overweight</td>
<td>18.35</td>
<td>17.69</td>
</tr>
<tr>
<td>Pre Obesity</td>
<td>19.53</td>
<td>18.83</td>
</tr>
<tr>
<td>Obesity</td>
<td>13.30</td>
<td>12.82</td>
</tr>
</tbody>
</table>

Table 3 shows level of jemaah’s physical fitness. It indicates that most of jemaah have category of fair. Results of physical exercise program was conducted for 3 months, showed some improvements of physical fitness level.

Table 3. Physical Fitness Level

<table>
<thead>
<tr>
<th>Category</th>
<th>6 mon</th>
<th>3 mon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Good</td>
<td>9.03</td>
<td>9.95</td>
</tr>
<tr>
<td>Fair</td>
<td>46.99</td>
<td>49.31</td>
</tr>
<tr>
<td>Poor</td>
<td>30.09</td>
<td>31.25</td>
</tr>
<tr>
<td>Very Poor</td>
<td>13.89</td>
<td>9.49</td>
</tr>
</tbody>
</table>

Policy and Financial Support

The support of local government embodied in the form of Regent’s statement decree which regulated the implementation of HHP. The most important aspect in the content of the decree was the examination of prospective pilgrims has no charge (free). The operational costs and all expenses for health examination and health promotion were entirely charged to the 2014 Lumajang local budget. In general, total health spending at DHO in 2014 amounted to Rp. 211 123 977 790 ($ 17,600,000 US) or by 12.98% of total district budget. In specific, hajj health development fund of 2014 amounted to Rp. 134.8 million or 0.064% of DHO total health budget. This fund used to finance the hajj preventive-promotive program for 900 jemaah.

Discussion

The study found 49.31% of jemaah’s physical fitness measured by $\text{VO}_{2\text{max}}$ had category of fair. Astrand\(^1\) states that $\text{VO}_{2\text{max}}$ is the maximum amount of oxygen taken and used by someone while doing activities. If the $\text{VO}_{2\text{max}}$ value is low, then someone will become easy to feel tired, low in physical work ability and declining health condition.\(^10\) Decrease in physical activity and cardiorespiratory fitness levels due to age factor may lead to an increase in the risk of non-communicable diseases.\(^5\) Physical fitness level can be improved by doing physical exercise regularly.\(^20\)

Discussion of policy analysis refers to the concept of analysis of policy implementation developed by WHO. The analysis includes equity, efficiency, quality, and community empowerment. This concept is in line with the opinion of Robert\(^18\) which states that performance indicator of health system analysis can be measured through the aspect of access or equity, efficiency, and quality.

Equity

Definition of equity released by WHO stated that health service should be distributed equally.\(^22\) The results of implementation of hajj health policy in Lumajang showed that local government has guaranteed free and accessible health care services for all community. The local government provided health care services regardless of their resident status, employment and economy status. In other words, every jemaah has the same right to gain access to the service. DHO established 10 health centers (Puskesmas) out of 25 Puskesmas to carry out health examination and health promotion for jemaah. The examination schedule was made differently in 10 health service locations. The aim was to provide convenience for prospective pilgrims in choosing location and time available. If the pilgrims are unable to attend in 10 available schedules and locations, then they still have a chance and provided the option of choice of time to get service at DHO. This fact shows that district government is very attentive to prospective pilgrims and seeks to provide the best health services.

Efficiency

The number of deaths nil (zero death) becomes a measure of efficiency. The availability of resources should be utilized as much as possible to achieve impact indicator, such as health status of jemaah. It is also explained by Murray\(^16\) that the performance of a program could be appraised by how far the existing
resources have been utilized to achieve the goal of health programs. Measure of efficiency can simply be determined by comparing between the availability of health funding for HHP and health status of jemaah (before departure and after returning home). In 2014 DHO allocated budget for the HHP implementation of Rp. 134.8 million. This figure could be fully utilized to fund the development of the HHP, so Lumajang in 2014 was finally able to achieve the status of zero death. This means that all 710 jemaah with a high-risk group of about 34% could return to their homeland safely. In other words, none of Lumajang pilgrims died during the pilgrimage. This analysis was consistent with the definition of efficiency of WHO stating that the orientation of health service should be proactive by optimizing cost and technology. This fact indicated that the implementation of HHP according to the system approach has managed to achieve a predetermined impact indicator.

Quality

According to WHO, government should provide a qualified service for all citizens and improve quality of health services that is comparable to international health care quality. To obtain qualified health services for jemaah, local government has established a hajj operation team. Furthermore, the DHO issued a policy that regulates and establishes health screening and health coaching as both mandatory activities that must be followed by all jemaah before leaving for SA. If jemaah do not carry out all the stages, then they will not receive Hajj Health Handbooks (BKJH). If jemaah do not have BKJH, they do not meet the complete document as a requisite for departing. The results of medical examination and physical fitness test constitute an absolute requirement. The components are checked in physical fitness program, namely body weight, height, waist circumference, BMI and VO2max. DHO policy was issued in an attempt to nominate pilgrims who are eligible or ineligible to depart. The quality of health and physical fitness of jemaah are strongly associated with health promotion activities which have been done. Therefore, information on health status of jemaah registered in BKJH should really reflect health condition of jemaah. This policy is intended to prevent irregularities in data entry of BKJH. Waluya said that each institution could make an effort to prevent social deviations both persuasive and non persuasive and encourage and lead people to behave in accordance with the values and norms that have been established.

Community Empowerment

Community empowerment and self-reliance is one of the principles of HHP implementation, as mandated in MOH regulation. The essence of this principle is to encourage all jemaah to perform healthy lifestyle. Active community participation in HHP can be realized through the establishment of sport-health cadres (community health volunteers). DHO has a role in recruiting, training and fostering sport-health cadres. In 2012 there were 205 cadres who had been trained and increased to 207 in 2015. Cadres have an important role in providing access to health information, especially about benefits of completing health examination and performing physical exercise. The availability of access to health information and the establishment of good communication makes jemaah are interested in doing physical fitness exercises. Communication method used by cadres include home visits, counseling, and involving religious leaders or community leaders. In conducting home visits and group coaching, cadres equipped with recording and reporting instruments. Cadre is a motivator and role model trusted by society. This approach is in accordance with the opinion of Laverack who says that community empowerment built from individual, group to community at large. Cadres work voluntarily without incentives. Therefore, the sustainability of cadres support strongly influenced by cadres' motivation. Puskesmas should create activities that support the sustainability of cadres through involving cadres in Puskesmas programs, refreshing cadres, and providing rewards for the outstanding cadres.

Based on the above, it is not an exaggeration to say that policy makers and program managers have provided special attention to health promotion through the development of community-based hajj health. This fact is in accordance with the opinion of Beaglehole which states that community-based approach through health promotion training has contributed to the development of public health. By taking community as a partner, it means that government has given power and a wider space for community to play a role in managing resources. This opinion is supported by Laverack which states that health promotion could be seen as a tool to build community empowerment. Furthermore, Nutbean then clarifies the opinion by explaining that empowerment is the core of health promotion.
Conclusion

HHP has been successfully executed in Lumajang and in line with the MOH regulation no. 442/2009. The implementation of MOH policy is in accordance with WHO performance indicators including equity, efficiency, quality, and community empowerment. Health protection of jemaah, particularly high-risk group has been achieved through the preparation of pilgrims before leaving for SA with health promotion and the availability of access to qualified health services and support of community participation facilitated by sport-health cadres. The improvement of physical fitness level has been achieved through a 3-month physical exercise program. The implementation of fostering physical fitness based on the guidelines is able to protect and improve health of pilgrims in performing all stages of hajj ritual process.

Ethical Clearance: Taken from the SPH-UI ethics commission

Source of Funding: Myself

Conflict of Interest: Nil

References

Effects of BLS Education using a bed on the Quality of Chest Compression

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Abstract

Purpose: This study aimed to change the teaching method to improve the performance of high quality chest compression. Method: A quasi-experimental approach with a nonequivalent control group research design was used. 46 subjects were recruited, and randomly assigned to two groups: the experimental group (23 participants; CPR performed on a bed) and the control group (23 participants; CPR performed on the floor). One participant of experimental group did not attend, and thus, 45 participants (22 experimental group and 23 control group) constituted the study cohort. Results: Results showed that new BLS training method used in this study was more effective in high quality CPR than previous method. Conclusion: Nurses may encounter a patient that has experienced on a floor, bed, or any setting, although student nurses are more like to witness cardiac arrest on a bed.

Keywords: BLS, Education, Chest Compression

Introduction

Medical personnel, especially nurses, must maintain cardiopulmonary resuscitation (CPR) skills because cardiac arrest often occurs unexpectedly and the ability to manage situations directly affects patient survival and outcomes¹. During the early stage of cardiac arrest, effective CPR (appropriate speed and depth of compression, complete relaxation between compressions, minimization of hands-off time, and the avoidance of excessive ventilation) is critical²,³,⁴, and therefore, nurses are required to administer CPR accurately and effectively.

Currently CPR training of healthcare professionals is conducted in accordance with the Basic Life Support (BLS) guidelines issued by the American Heart Association (AHA) and Korean Association of Cardiopulmonary Resuscitation (KACPR), and training involves demonstrating CPR on mannequins placed on the floor. However, results show that CPR quality is dependent on operator position, that is, whether he/she is kneeling on the floor, standing next to the patient’s bed, or kneeling on the bed⁵,⁶,⁷,⁸,⁹,¹⁰,¹¹. Also, it has been proposed that a backboard should be used to perform CPR due to the different widths and firmness of mattresses¹².

As previously mentioned, cardiac arrest in hospital occurs suddenly. So, the use of a backboard may be difficult. In the present study, we undertook to determine the need for change in the Basic Life Support (BLS) training method for student nurses by comparing the quality of chest compression in an experimental group, in which BLS training was conducted on a bed, to that of a control group, in which traditional training was conducted on the floor.

Material and Method

Design

A quasi-experimental approach with a nonequivalent control group research design was employed to evaluate the quality of chest compression after cardiopulmonary resuscitation training course on the floor as compared with training on a bed.
Sample

Nursing students in the third year of a baccalaureate nursing program were chosen as study subjects. The criteria for participation were willingness to participate in the study and not having BLS provider certification as a health care provider. A priori power analysis was performed using G*Power 3.1 software with an effect size of 0.8 and a power of 80% (one-sided test at an alpha value of 0.05), and it showed 21 participants were required per group. Assuming a 10% attrition rate, 46 subjects were recruited, and randomly assigned to two groups: the experimental group (23 participants; CPR performed on a bed) and the control group (23 participants; CPR performed on the floor). One participant of experimental group did not attend, and thus, 45 participants (22 experimental group and 23 control group) constituted the study cohort.

This study was reviewed and approved by a University Institutional Review Board. After obtaining approval, general characteristics, heights, weights, and chest compression data were measured and recorded. Participants were informed at the beginning of the course that participation was voluntary and that they could withdraw from the study at any time without prejudice.

Ethical consideration

This study was approved by the Institutional Review Board of D university (CUIRB-2016-0014).

Intervention

The only difference between the two groups was mannequin’s position. Neither group was informed that beds were being used in any training program and in the chest compression test. In accordance with norm, the control group was trained on the floor, whereas the experimental group was trained on a bed without a step. In order to avoid diffusion between the two groups, the control group (on the floor) underwent training on the first day of the experiment, and the experimental group (on the bed) were trained on the following day; 11 to 12 participants attended one of two 4-hour training sessions conducted on each day. A standard hospital bed frame (SSH-220, 200*70cm, Sungsim) with a foam mattress (185*65*6cm, soft foam with polyester coverage; Sungsim) was fixed at a height of 50cm. Both groups were trained on other BLS topics according to the 2010 AHA and 2015 KACPR CPR guidelines. The intervention was administered by the two authors who had BLS instructor certification issued by AHA and over 5 years of experience teaching BLS.

Data collection

Participants’ general characteristics, heights, weights, and chest compression qualities were recorded. Before BLS training, general characteristics were obtained using self-reported questionnaires and height and weight were measured using (BSM370, 15.5kg; Biospace, Korea). Chest compression qualities were evaluated using a Resusci Anne Simulator equipped with PC Skillreporting (Laerdal Medical, Stavanger, Norway) after the BLS training course. Participants were informed that the evaluation would be based on the data automatically recorded from the mannequins. Mannequins were positioned on the bed in the same manner as mannequins positioned on the floor.

Participants were instructed to complete 5-cycles of resuscitation. Chest compression qualities were evaluated according to the 2015 KACPR BLS guideline. Chest compression qualities were assessed using; correct compression (%; compression depth 5-6cm, lower half of the sternum), compression rate (n/min), mean compression depth (mm), correct chest recoil (%), correct hand position (%), and total hands-off time (sec).

Data analysis

The analyses were performed using IBM SPSS Statistics 19.0. $\chi^2$ or t test for comparison of general characters and outcome variables between two groups were used

Findings

Comparison of general characteristics between two groups

Forty-five students were enrolled in our study (control group: 23, experimental group: 22). No significant difference was found between general characteristics, that is, age, sex, CPR education, and previous chest compression experience, of the experimental and control groups. Furthermore, group mean heights and weights, which are important variables in the context of chest compression, were not different (Table 1).
### Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Variables</th>
<th>Control (n=23)</th>
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<th>p</th>
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<tr>
<td></td>
<td></td>
<td>n(%) or M±SD</td>
<td></td>
<td></td>
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<tr>
<td>Sex</td>
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<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>21.83±2.71</td>
<td>20.82±1.18</td>
<td>1.61</td>
<td>.12</td>
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<td>Previous CPR education</td>
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<td>10(45.5)</td>
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<tr>
<td></td>
<td>Yes</td>
<td>15(65.2)</td>
<td>12(54.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous chest compression</td>
<td>No</td>
<td>19(82.6)</td>
<td>18(81.8)</td>
<td>0.01*</td>
<td>1.00</td>
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<td>Yes</td>
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<td>4(18.2)</td>
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<td>Height</td>
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<td>162.51±6.42</td>
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<td>55.90±11.53</td>
<td>57.91±6.80</td>
<td>0.71</td>
<td>.48</td>
</tr>
</tbody>
</table>

*: Fisher’s exact test

### Comparison of outcome variables between two groups

There were significant differences in correct compression (t=2.13, \( p=.039 \)), compression rate (t=3.59, \( p=.001 \)), and mean compression depths (t=4.26, \( p<.001 \)). Correct compression was 64.00±35.26 % among participants of experimental group and 43.96±27.47 % for those of the control group. Compression rates were 119.86±10.05 times/ min and 128.57±5.70 times/min among participants of the experimental and control groups, respectively. We found mean compression depths were 50.77±6.56 mm and 41.78±7.54 mm among participants of the experimental and control groups, respectively. We found no differences in other variables between two groups (Table 2).

### Table 2. Comparison of outcome variables between two groups (N=45)

<table>
<thead>
<tr>
<th></th>
<th>Control (n=23)</th>
<th>Experimental (n=22)</th>
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<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct compression (%)</td>
<td>43.96±27.47</td>
<td>64.00±35.29</td>
<td>2.13</td>
<td>.04</td>
</tr>
<tr>
<td>Compression rate (n/min)</td>
<td>128.57±5.70</td>
<td>119.86±10.05</td>
<td>3.59</td>
<td>.01</td>
</tr>
<tr>
<td>Mean compression depth (mm)</td>
<td>41.78±7.54</td>
<td>50.77±6.56</td>
<td>4.26</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Correct chest recoil (%)</td>
<td>84.17±25.04</td>
<td>94.27±15.41</td>
<td>1.62</td>
<td>.11</td>
</tr>
<tr>
<td>Correct hand position (%)</td>
<td>91.57±21.17</td>
<td>81.59±30.32</td>
<td>1.28</td>
<td>.21</td>
</tr>
<tr>
<td>Total hands-off time (sec)</td>
<td>10.48±1.44</td>
<td>9.82±1.22</td>
<td>1.65</td>
<td>.11</td>
</tr>
</tbody>
</table>

### Discussion

Over the last decade, the AHA has emphasized high quality chest compression during CPR. This study was attempted to change the teaching method to improve the performance of high quality chest compression. Results showed that new BLS training method used in this study was more effective in high quality CPR than previous method.

In this study, group correct compressions and mean
compression depths, indicating of proper hand position for chest compression of 5-6cm differed. This result supports previous reports regarding chest compression by doctors, nurses, and other medical professionals by showing chest compression depends on rescuer position. Rescuers performing chest compressions experience fatigue and exhaustion after 1 minute, which may reduce chest compression depth. Although the experimental group and the control group performed the same 5 cycles of CPR, the correct compression of the experimental group was 64.00% and the mean compression depth was 50.77mm. This indicates that the AHA and KACPR satisfy the chest compression guideline. This suggests that the experimental group is more familiar with chest compression on the bed than the control group. In addition, since CPR training is performed on the bed, it is possible that the strength of the chest compression needed to attain the recommended depth can be learned by considering the softness of the mattress during the training. The percentage of cardiopulmonary resuscitation performed by healthcare providers has been reported to be inadequate.

The causes of insufficient chest compressions vary, but the results of this study suggest that CPR training has only been performed at the bottom. For this reason, it is considered that chest compression of sufficient depth was not achieved in a hospital cardiac arrest situation. Therefore, it is recommended that doctors and nurses examine BLS training in hospitals bed to see if there is any change in the quality of chest compressions in the actual CPR situation.

According to another study, which examined chest compression by rescuers of height <170cm and weight <65kg, placing an object 10cm above the floor and below the knee was found to be effective. In the same manner, the use of a kneeling board could possibly lead to higher quality chest compression.

The AHA guideline states that at least hundred or more compressions per minute are needed to achieve adequate chest compression quality. In the present study, compression rates of the experimental and control groups were non-significantly different (119.86±10.05/ min and 128.57±5.70/min, respectively). However, the guidelines issued by the European Resuscitation Council (ERC) state that the quality of correct release is likely to decline if the chest compression rate exceeds 120 compressions per minute. The KACPR guideline, which comprehensively includes such recommendations, endorses a chest compression rate of 100 to 120 compressions per minute, which concurs with our results. The control group had a mean chest compression rate of 120 per minute and correct chest recoil 84.17±25.04% , which was non-significantly lower than 94.27±15.41% of the experimental group, this possibly explains why did not amount to a greater quality chest compression or speed. Furthermore, after performing chest compression with a mattress, one of the students in the control group commented, “I exerted more force because of the flexibility of the mattress and carefully checked for sufficient chest relaxation.” That is this student was motivated to increase the quality of chest compression.

No intergroup difference between correct hand position and total hands-off time were observed. It has previously been reported that height difference associated with the performance of CPR on a floor or bed affect chest compression depth and rate, but do not affect proper hand position on the sternum or minimizing hands-off time to less than 10 seconds. Consequently, educational materials do not need to be modified for different training environments, rather emphasis should be placed on establishing consistent guidelines.

AHA and KACPR emphasized minimizing hands-off time. In this study no intergroup difference between hands off time was observed. However, mean hands-off times in the experimental and control groups (9.82±1.22 and 10.48±1.44 seconds, respectively) were near to the maximum recommended by the AHA and KACPR (≤10 seconds). This is an area that requires training to shorten hands-off time during chest compression to increase the chance of patient survival.

In conclusion, nursing students would be better able to cope in the clinical practice were BLS training performed on a bed. Numerous opinions are held on the quality of CPR with respect to rescuer positions. We suggest students should receive training and education periodically to increase their abilities and preparedness to perform CPR anytime when faced with sudden cardiac arrest.

**Conclusion**

Nurses may encounter a patient that has experienced on a floor, bed, or any setting, although student nurses are more like to witness cardiac arrest on a bed. We suggest
current BLS training targeting medical professionals should include both on-the-floor and on-the-bed environments and that skills be improved by providing guidelines that allow would be rescuers to self-monitor the quality of chest compression.

Conflict of Interest: No conflict of interest.

Source of Funding: This study was supported by research grants from Daegu Catholic University, 2019.

Ethical Clearance: Taken from the Institutional Review Board of D university (CUIRB-2016-0014).

References

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resuscitation and emergency cardiovascular care. 2010.


Relationship of Family Support to Antenatal Care (ANC) Inspection in Work Area of Puskesmas Gunung Anyar Surabaya

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Abstract

One indicator of the level of health quality of a region is the Maternal Mortality Rate (MMR). The maternal mortality rate in Surabaya is still high. At 2016, AKI is 85.72 per 100,000 live births. Antenatal Care (ANC) is a pregnancy examination to optimize the mental and physical health of pregnant women, so as to be able to deal with labor. This study aims to analyze the relationship between family support for ANC examination in pregnant women in the work area Puskesmas Gunung Anyar Surabaya. This analytic observational study used cross sectional approach. The population of this study is pregnant women in 2018 in the work area Health Center Puskesmas Gunung Anyar Surabaya as much as 1089 respondents. Sampling was done by using Random sampling system to get 75 respondents. Collected data is processed statistically using Spearman test. Spearman test result with 95% confidence level, obtained p value <0,022. Based on the test results, the hypothesis proposed is accepted in other words there is a relationship between family support with ANC examination. Furthermore, the correlation coefficient (r) 0.264 shows that there is a positive correlation and a strong relationship between the function of family support with compliance ANC examination. Based on this research it is suggested that health practitioner give counseling to the nearest family, especially husband to actively participate in supporting pregnant mother to conduct pregnancy examination in health service.

Keywords: Antenatal Care (ANC), Family Support, Maternal Mortality Rate (MMR)

PRELIMINARY

Maternal mortality rate (MMR) is one indicator of the health level of a region. In other words, the high maternal mortality rate, indicating the low level of health in the area. Maternal Mortality Rate (MMR) describes the number of mothers or women who died from a cause of death related to pregnancy or treatment disorder (excluding accidents or incidental cases) during pregnancy, childbirth and in the puerperium (42 days after delivery) without taking into account the length of pregnancy per 100,000 live birth. Maternal Mortality Rate is useful to describe mother’s nutritional status and health, environmental condition, health service level especially for pregnant mother, mother during childbirth and childbirth.

Based on the Indonesian Demographic Health Survey (SKDI) in 2015, the maternal mortality rate in Indonesia is still high at 305 per 100,000 live births. This figure is slightly decreased when compared with the SDKI in 2012, which amounted to 359 per 100,000 live births. The high maternal mortality rate makes Indonesia fail to achieve the Millennium Development Goals (MDGs) target of 2015 MDGs target is 102 per 100,000 live births.

Maternal Mortality Rate in Surabaya City in 2016 was 85.72 per 100,000 live births. This number decreased from the year 2015 which amounted to 87.35 per 100,000 live births.

Antenatal care (ANC) is a pregnancy test to optimize the mental and physical health of pregnant women. So that able to deal with childbirth, postpartum, preparation of breastfeeding and a reasonable return of reproductive health. An ANC visit is a pregnant woman’s visit to a midwife or doctor as early as possible since she feels she is pregnant for antenatal care or care. Antenatal care is to prevent obstetric complications whenever possible and to ensure that complications are detected as early as possible and adequately addressed.
Maternal and maternal mortality is influenced by several factors, namely late 3 risk factors that are late in making decisions at the family level, late referring, late to handle. In addition, too four factors are too young to be under 20 years old, too old over 35 years, too close to birth less than 2 years, and too many / more than 4 times of childbirth.

Late risk factors for family-level decision making are a lack of family support in their role against integrated ANC examination. Families are two or more of two individuals who are affiliated because of blood relations, marital relations or rapture and they live in one household, interacting with each other. A person’s life does not necessarily live individually, there is help from others. The family is the closest person to help and help each other, especially during pregnancy.

Based on the above description, it is deemed necessary to examine the relationship between family support with the status of ANC examination in pregnant women in the work area of Puskesmas Gunung Anyar Surabaya.

**Method**

This research is a research using quantitative observational analytic method. The study approach used is cross sectional which takes a sample from the population at one time. Population in this research is pregnant woman in work area of Puskesmas Gunung Anyar equal to 1089 pregnant mothers in year 2018. The sample in this research is pregnant woman taken by random sampling with amount of sampel determined counted 75 responden which then taken data of pregnancy examination through KIA book with the same time. Data analysis used SPSS Spearman test as correlation test of two categorical variables.

**Research Result**

Characteristics of respondents used in this study were assessed based on age, education, and income that can be seen in the distribution of the table below.

| Table 1. Characteristics of Respondents by Age, Education, and Revenue. |
|--------------------------|------------|--------------|
| **Variable**            | **N**      | **Persentase %** |
| Age                     |            |              |
| <20 year                | 24         | 32,0%        |
| 20-35 year              | 38         | 50,7%        |
| >35 year                | 13         | 17,3%        |
| Education               |            |              |
| Under Bachelor          | 30         | 40,0%        |
| Bachelor                | 45         | 60,0%        |
| Work                    |            |              |
| Not Work                | 31         | 41,3%        |
| Work                    | 44         | 58,7%        |

Based on table 1, it can be concluded that based on age the majority of respondents aged between 20-35 years. Based on the characteristics of education, most respondents complete education up to Bachelor Degree. While based on the work of more than half of respondents is working.

| Table 2. Distribution of respondents based on family support |
|--------------------------|------------|--------------|
| **Family Support**       | **N**      | **Persentase %** |
| Not Support              | 28         | 37,3%        |
| Support                  | 47         | 62,7%        |
| **Total**                | 75         | 100%         |

Based on table 2, it was found that 37.3% of respondents have not received family support. Furthermore, 62.7% of respondents have received family support.

| Table 3. Distribution of Respondents Based on ANC Inspection |
|--------------------------|------------|--------------|
| **ANC Inspection**       | **N**      | **Persentase %** |
| Not done                 | 3          | 4%           |
| Done                     | 72         | 96%          |
| **Total**                | 75         | 100%         |

Based on table 3, more than half of respondents are as many as 72 families 96% carry out the functions of ANC well. There are 3 families or 4% who have not done ANC well.
Table 4. Cross Distribution Between Family Support and ANC Inspection

<table>
<thead>
<tr>
<th>ANC Status</th>
<th>Family Support</th>
<th>Total</th>
<th>R</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Tidak</td>
<td>0</td>
<td>3</td>
<td>0,264</td>
</tr>
<tr>
<td>ANC Not Done</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0,264</td>
</tr>
<tr>
<td>ANC Done</td>
<td>25</td>
<td>47</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>47</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 4, out of 75 of respondents who were interviewed, obtained the result of 3 respondents have not done ANC examination and did not get family support. Furthermore, as many as 25 respondents have done ANC examination but did not get support from family. A total of 47 respondents have conducted ANC examination and received support from the family. This suggests that the more there is family support the compliance to carry out ANC examinations is increasing.

Based on statistical test result using Spearman hypothesis test with 95% confidence level so obtained p value <0,022 then hypothesis accepted. This means that there is a connection between the family support function and the compliance of the ANC examination. Correlation coefficient value obtained (r) 0.264 which indicates a positive correlation. indicating a strong relationship between family support functions and compliance with ANC examinations.

**Discussion**

The result of this research is $r = 0.264$, $p = 0.022$ ($p <0.05$) indicating significant relationship between family support function and compliance of ANC examination. It shows that the better a family plays an active role in supporting and motivating, it will be more obedient also pregnant women in the family to conduct ANC examination well and complete.

Families are two or more individuals who join because of blood relations, marriage and adoption in one household, who interact with each other in roles and create and maintain a culture.

Family support can be realized if the family function runs optimally. The five main aspects of family function are adaptation, partnership, growth, affection, and togetherness. With the implementation of these functions, then a prosperous family is formed with members who give each other support.

Family support is important in the realization of a positive thing. Family support sees that supportive people are always ready to provide help and help if needed. The nuclear family as well as the extended family function as a support system for its members, both in the form of emotional, instrumental, informative and rewarded.

Family support among others comes from the support of husband, family or other relatives, parents, and in-laws. Husband support is very important because the husband is the closest member who can reduce anxiety in pregnant women. In line with Hafidz (2007) in his research on the relationship of husband and parent role with pregnant woman behavior in ANC service, got result of significant relation between husband role and pregnant woman behavior in ANC service.

In line with research conducted by Rahayu in 2015, shows a link between family support and the implementation of the ANC. The lower the family support the possibility of non-compliance in carrying out the higher ANC. The results of this study are supported also by previous research by Agustini et al (2013) who also examined the relationship between family support with ANC visit of pregnant women at Puskesmas Buleleng I Bali.

**Conclusion**

Based on research results and the above discussion, can be concluded that there is a significant positive relationship between family support and ANC service coverage. The higher the family support, the higher the scope of a good ANC examination can be accomplished, thus reducing the risk of maternal death.

**Ethical Approval:** Related departments should be assured about the confidentiality of the results of questionnaires.

**Conflict of Interest:** The authors report no conflict of interest.
Source of Funding: Self

SUGGESTION

1. To health practitioners are expected to be more active to do tips in order to reduce maternal mortality by providing views or counseling to the nearest relatives, especially husbands in order to play an active role in supporting pregnant women to perform examination of pregnancy in health services.

2. It is expected that the next researcher can make this research as input and information for further research and can examine other factors related to pregnancy examination in health service.

References

The Implementation of Health Promotion in the Hospital in Ra. Basoeni Hospital in Mojokerto District

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Abstract

Nowadays, the orientation of hospital services is not only focusing on curative and rehabilitative, but also prioritizing on preventive and promotive aspects in order to be a health promoter hospital.

The research was a qualitative study that analyze the implementation of health promotion in RA. Basoeni General Hospital based on Ministry of Health RI the standard of hospital as health promoter which includes the management policy aspects and intervention to the patient in health promotion aspects in relation to patient and family right. The research applied in-depth interview, observation and document study as data collection methods.

The research indicated that RA. Basoeni General Hospital had try to fulfilled the standard of Ministry of Health RI as health promotion hospital. The management policy aspect of RA. Basoeni General Hospital had been implemented in a strategic plan such as annual work plan. The human resources in RA. Basoeni General Hospital is sufficient in quantity, but training on health promotion in the hospital is needed to improve the quality. The budget had been included in the budget plan of RA. Basoeni General Hospital. The facilities and infrastructure were not good qualitatively, and quantitatively it must be increased. The documentation of intervention had been implemented routinely. The evaluation was also conducted in monthly or annually meetings. The study of patients intervention, and the assessment on health promotion requirement for the patients need was obtained from the medical record of health history of patient since the patient’s visit to the hospital. The access of information about health promotion for the patient had been presented either verbally or written, in addition it has also been presented in audio and visual forms.

Keywords: Standard of Ministry of Health RI on health promotion hospital, management policy aspect, Patient Intervention Aspect

Introduction

The hospital is a health facility that must be integrated into the health system in which it is located. Function as a resource center to improve public health in the region concerned. Reform of hospitals in Indonesia is needed because there are still many hospitals that only emphasize on curative and rehabilitative aspects only.¹,²,³

In Regulation Number 44 Year 2009 on Hospital in Article 1 mentions the definition of a hospital is a health service institution that provides full-scale private health services providing inpatient, outpatient, and emergency care services. Furthermore it is said that complete Health Service is health service which include promotive, preventive, curative, and rehabilitative.⁴,⁵

Health Promotion of Hospital is done in RSUD RA. Basoeni by delegating health promotion activities to every installation / work unit. Thus the activities undertaken are not integrated with the overall organization of the hospital. Based on the information received and the results of direct observation, the current health promotion effort in each hospital unit has not run optimally so that the patient and family in RSUD RA. Basoeni has not received patient and family rights for health promotion hospital activities. This is based on data obtained from preliminary surveys on 10 patients and families of outpatient that 4 of them have not received an explanation of disease prevention and health efforts. In
the suggestion box that is in the clinic room, according to RSUD RA. Basoeni in general hospital visitors complained about the lack of information about health by health personnel in RSUD RA. Basoeni Kabupaten Mojokerto.

**Method**

The research was a qualitative study that analyzed the implementation of health promotion of RA. Basoeni General Hospital based on Ministry of Health RI standard on the standard of hospital as health promoter that compliance the management policy aspects and intervention to the patient in health promoter aspects in RA. Basoeni hospital In mojokerto district. The research was applied indepth interview, observation and document study as data collection tools. Research subjects in this study consisted of informants and key informants. 

Key informants and informants in this study are as follows:

1. Key informants: Team leader health promotion of hospital RSUD RA. Basoeni Kabupaten Mojokerto with purposive sampling technique as many as 5 people.
2. Informant:
   a. Outpatient RSUD RA. Basoeni with purposive sampling technique in internist care as many as 11 people
   b. Family who accompany the outpatient RSUD RA. Basoeni as many as 11 people

**Results**

**Hospital Policy related Health Promotion of Hospital**

Health promotion of hospital program is part of the vision and mission of RSUD RA. Basoeni to commit to provide quality services include Promotional, preventive, curative and rehabilitative efforts. Hospital’s policy has also supported the implementation of health promotion of hospital with Decree of Director (SK) Number 124 / KEP / 416-212 / 2016 regarding the establishment of health promotion hospital team RSUD RA. Basoeni as found in the following in-depth interview statement:

“... health promotion hospital already have SK Director for the establishment of health promotion hospital Team ....” (JN, 42 years)

**Hospital Human Resources to run health promotion hospital**

Human resources owned by the hospital’s health promotion unit is still minimal, with no special staff with educational background and health promotion training. The task of carrying out the Health Promotion of Hospital (health promotion hospital) is still considered as a supporting activity only. This was conveyed by one of the informants as the result of the following in-depth interviews:

“... health promotion hospital implementation is perceived less well, the cause is the power handling health promotion hospital still feel that health promotion hospital only side activities, may be busy with patient service ..” (JN, 42 years)

**Health Promotion Hospital’s Fund**

The result of observation and interview with health promotion hospital coordinator got result from fund input indicator of health promotion hospital activity that can Provide health promotion hospital fund in RSUD RA. Basoeni still not stand alone but allocated with other activities. This is evident from the following in-depth interviews;

“...... for health promotion hospital fund has not been planned by itself. The collection of leaflets and honorariums can not yet appear on their own but in other activities ...” (AY, 38 years)

Readiness of funds in the work program is very important. Because every work program requires a lot of funds. Limitations of funds cause work programs that can be implemented also slightly.

**Hospital Infrastructure Facility in Running health promotion hospital**

Based on the results of in-depth interviews with informants obtained that existing facilities in the hospital has not supported the implementation of health promotion hospital program in RSUD RA. Basoeni. This is indicated by the absence of special room health promotion hospital so it still must be implemented in the lobby hall with a limited seat. In addition, facilities
and infrastructure extension is also still limited. The facilities include leaflets, audio-visual devices which, when damaged, can not be implemented, health promotion hospital activities due to long repairs and no reserves. The statement tersebuit line with the results of the following in-depth interviews:

“... The obstacles are on the infrastructure such as the current LCD is damaged so it can not be used, side effects are health promotion hospital activities can not run ...” (AY, 38 years)

Health promotion facilities are very important in the implementation of health promotion of hospital program. To improve the audience understanding it is necessary some audio visual media such as LCD, video that can change the knowledge and perception of patients about health. Media used by officers to share information to patients and their families in the form of leaflets and brochures.

The Implementation Process of Health Promotion Hospital in RSUD RA. Basoeni Kabupaten Mojokerto Year 2016

A good health promotion program should be built in accordance with a systematic and sustainable framework. Implementation process of health promotion hospital program in RSUD RA. Basoenei through the stages of planning, implementation and evaluation. This is as obtained from the following in-depth interviews:

“... In the work program reported to the director there is an evaluation of activities. If there are discrepancies will be analyzed the points that are not appropriate then what constraints are established and alternative solutions ... “(AY, 38 years)

“... Implementation is good, not just management but all involved in good coordination. Internal programs include extension of visitors, through media leaflets. For external activities through scheduled district radio and interactive questioning ... ”(AY, 38 years)

Intervention studies on patient needs and access to patient convenience for information on health promotion have been implemented since the first time the patient received health care and can be seen from the patient’s medical records. Access to health promotion information is obtained by means of oral, or written / leaflet explanations, as well as through audio visual media but is minimal. The information should be given to the hospital in order to assist the healing process of the patient. In addition, the patient’s family will become more understanding about health information related to their sick family.

“... Yes, it is very important to help the healing of sick families ...” (N, 24 years)

“... Information becomes the right of the family to speed up healing and family understand ...” (M, 32 years)

Patients are very lacking in getting information about the drugs to be consumed and the course of his illness to get well and healthy again. The informant also responded that education and health information is the right of the patient during hospitalization

“... About medicine and how to recover from my illness ...” (E, 60 years)

“... The unclear problem is how to let it not recur and recover quickly, prohibited food, when to stop the drug ...” (27 years)

“... It is not clear the problem of how to cure, it is not clear the administrative problem of BPJS assurance usage and must add how ...” (M, 39 years)

Family of patients who accompanied the patient during service in RSUD RA. Basoenei has generally received an explanation of the disease. The explanation comes from family members who were accompanied orally. The patient’s family usually feels that they have not received any explanation or information about efforts to speed healing and administrations and the types of drugs to be drunk.

Discussion

Result of research concerning policy commitment of health promotion effort at RSUD RA. Basoenei Mojokerto regency indicates that it has received strong commitment, this commitment is realized in the form of strategic plan which has been compiled in annual work plan. Every hospital health promotion effort has been implemented in accordance with the work plan. In the implementation of health promotion efforts of this hospital itself is implemented all installations in RSUD RA. Basoenei, where the implementation is done directly by the installation related to coordinate with the supporting field as the responsible for the implementation of all health promotion efforts of the hospital. Evaluation
efforts have also been undertaken based on the work plan that has been prepared beforehand, the evaluation is seen from the work whether it is in accordance with the work plan that has been set. For the improvement of the hospital’s health promotion efforts have started running but not all aspects can be improved, there are some obstacles that become obstacles in the effort of health promotion of the hospital.

Based on the research conducted by Lukman on the management policy aspect of Health Promotion in H.Adam Malik Hospital Medan policy commitment must be emphasized in the implementation of Health promotion in order to be able to run in accordance with the objectives of the hospital as a health service facility that provides full range of personal health services including promotive, preventive, curative, and rehabilitative as mandated in Law Number 44 Year 2009 about Hospital.\(^{(4,5,6)}\)

Health Promoting Hospital or hospitals that promote health in the world today has become a trend and is seen as a hospital for the future because it integrates all aspects of service holistically and inclusively to health on an ongoing basis. Holistic service aims that the services performed by hospitals are not only physiologically oriented but also covering all human dimensions including bio, psycho, socio and other determinants that are oriented towards salutogenic.\(^{(12)}\)

Related to the availability of human resources in the effort of health promotion of hospital in RSUD RA. Basoeni, from the results of the research note that in the planning of human resources for the implementation of health promotion efforts hospital in RSUD RA. Basoeni arranged in the structure of tasks and job descriptions written, especially for the responsible implementation of health promotion efforts namely the field of support. However, the establishment of officers in their implementation in other work units such as outpatient and pharmacy does not have specific jobdesk for resource persons for implementation in every installation. Specified resource persons are usually nurses, doctors or officers who are directly elected by the support field without any written structure and job descriptions. The human resources responsible in the implementation of health promotion efforts of existing hospitals are able to carry out the duties and responsibilities that have been given, but still found some obstacles that hinder the smooth implementation of health promotion efforts of the hospital that officials feel PKRS only as the supporting element only and not as the main task of health services.

The result of research related to the evaluation is known that the quality of human resources as a whole is good enough, but there are still some shortcomings related to the special abilities of the current human resources especially in outpatient. For improvement efforts to date the RSUD RA. Basoeni has not provided serious services and concerns regarding the quality of human resources available, it is known from the research that until now there has been no special training for health promotion’s officers related to the promotion of hospital health but only effective communication training.

Skilled human resources are needed in the implementation of health promotion of hospital activities. Improving the quality of human resources through education and training and the addition of human resources in quantity also support the implementation of health promotion of hospital well.\(^{(7)}\)

The development of health promotion in hospitals in Indonesia has increased quite rapidly. Technological advances also participate support the development of health promotion in Indonesia. The delivery of health information becomes faster in access. It is not possible to create a technology-based discussion group for patients with the same type of disease can be created by a hospital. Technological developments can also develop a mobile network device to detect, monitor, diagnose, so get advice and treatment. Promoting health through an integrated health care system will be an option in today’s technological advancement era.\(^{(1,2,11)}\)

Based on Regulation no. 36 of 2009 on Health, states that one of the resources in the health sector is a health service facility, where article 1 point 7 defines the health service facilities of a tool and / or place used to carry out health service efforts, whether promotive, preventive, curative as well as rehabilitative by the government, regional government or the community.\(^{(6)}\)

From the results of the study it is known that related efforts assessment of health promotion needs for patients, in the planning of health promotion efforts for patients has been implemented from the beginning of the patient entered the hospital. The form is a written report on the medical record of the patient’s medical history. Patients are also given information every health promotion will be held.
Conclusion

To comply the standards health promotion in the hospital include management policy aspect and patient intervention study that is by improving the quality of human resources for health promotion hospital activities through training of education capability, making health promotion hospital budget routinely and transparently in managing by health promotion hospital team, infrastructure to provide special space health promotion hospital in each unit and make guidance on patient education information in each service unit. Patient intervention studies and access to health information should benefit from more interesting audio-visual technology.

Conflict of Interest: All authors have no conflicts of interest to declare.

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Ethical Clearance: This study was approved by Ethical Commission of Health Research, Faculty of Public Health, University of Airlangga Surabaya.

References

The Effect of Edutainment Usage on Improving Knowledge, Attitudes, Balanced Nutrition Fulfilling Behavior in the Prevention of Anemia and Changes in Hemoglobin Levels in Adolescent Girl

(Case Study Of SMPN 4 Banjarbaru)

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¹Student of Public Health Magister Program, ²Environmental Health Department, ³Department of Pathology Anatomy, Ulin General Hospital, Medical Faculty Lambung Mangkurat University

Abstract

The prevalence of anemia in adolescent in Indonesia is high enough that 21.7% with anemia patient aged 5-14 year equal to 26.4% and 18.4% patient aged 15-24 year. Banjarabaru is the highest incidence of anemia in adolescents in South Kalimantan Province of 58.75%. Research Objectives is to analyze the effect of edutainment use on the improvement of knowledge, attitudes, behavior of balanced nutrition fulfillment in prevention of anemia and change of hemoglobin level in female adolescent. This research used Quasi Experiment design with pre-test and post-test group design approach. The number of samples of 90 young women taken with purposive sampling technique. The data obtained were then analyzed using Paired T-Test and Wilcoxon statistical tests for paired differential test, and Anova and Kruskall Wallis tests for unpaired test, followed by Post Hoc test for Anova test and Mann Whitney test for Kruskall Wallis test. The results of statistical analysis show that overall p value obtained <0.005 indicates that edutainment booklet and video edutainment have different effects before and after intervention to increase knowledge, attitudes, and behavior of balanced nutrition in prevention of anemia and changes in hemoglobin levels in adolescent girls.

Keywords: Edutainment, Knowledge, Attitude, Behavior, Anemia, Hemoglobin Level

Introduction

Anemia is a state of the body characterized by a deficiency in the size and amount of erythrocytes or at insufficient hemoglobin levels for the O2 and CO2 exchange function between the blood tissues. Based on Data Center and Information Ministry of Health of the Republic of Indonesia (2016) the average energy consumption in adolescents aged 13-18 years is 72.3% with the proportion of consuming <70% energy sufficiency (AKE) of 52.5% this shows that adolescents still consume energy below minimum requirements. Lack of energy required can lead to anemia. This is confirmed by Basic Health Research data of 2013 shows that the prevalence of anemia in Indonesia is 21.7% with anemia patient aged 5-14 year equal to 26.4% and 18.4% patient aged 15-24 years.

Data from South Kalimantan Health Office 2015 stated that the prevalence of female adolescent anemia in South Kalimantan is still quite high, that is 29.13% before the administration of tablets added blood, after the intervention of giving tablets plus blood result decreased to 13.64%. From 13 regencies, Banjarbaru city was 58.75%, which was the highest of adolescent anemia problem before giving tablet added blood followed by Regency of Banjar equal to 48.92% and Regency of Tanah Bumbu equal to 43.67%. This is corroborated with the results of data reports nutrition program Banjarbaru City in 2015 highest in SMPN 4 Kota Banjarbaru as many as 82.4% of adolescent girls who have anemia.

According to the Ministry of Health (2016), the impact of anemia on young women is able to lower the body’s resistance so that people affected by infectious diseases, decreased fitness and dexterity due to lack of oxygen to muscle cells and brain cells, and reduce
learning achievement and work productivity. Anemia is more prevalent in young girls than in children and in adulthood, as young women are at a time of growth and development and therefore need more sources of iron, in addition teens need more iron to replace the missing iron with menstrual blood. Adolescents with anemia then become pregnant will experience risks such as antepartum bleeding, abortion, premature birth, fetal growth and inflammation easily infected. Anemia in adolescents will result in lower ability and concentration of learning, interfere with growth so that the body does not reach the maximum, decrease physical ability, and result in a pale face.

Listiana research results (2016) showed that knowledge and attitude became one of the factors associated with the incidence of anemia in adolescents with a value of p-value of knowledge 0.002 and p-value attitude 0.001\textsuperscript{9}. Efforts that can be done to improve the application of balanced nutrition in adolescents in the prevention of anemia has not been optimal either direct efforts such as giving blood tablets or efforts not directly through counseling and socialization. This is corroborated by data from the Banjarbaru City Health Service report that after the intervention of blood-added tablets anemia still occurs on the second examination that is as much as 26.17% above the prevalence of anemia of South Kalimantan Province is 17.81%. So it is necessary other efforts to provide information related to nutrition in accordance with their needs one of them is to provide nutrition education in the form of edutainment counseling. Edutainment is one form of counseling or education that is packed in the form of fun entertainment\textsuperscript{10}.

According to Soul City Institute of Health and Development Comunication (2016) edutainment is one way of exploiting the enormous potential to influence individuals and society positively\textsuperscript{11}. The results of Bergmann’s study (2010) stated that over 600 (73%) of respondents showed positive responses favored learning with edutainment, and about 500 (66%) of respondents reported that they planned to make behavioral changes in healthy eating and physical activity. Only about 95 respondents (13%) did not want to plan to make changes, while the remaining 150 respondents (20%) answered still in doubt\textsuperscript{12}.

**Material and Method**

The method used in this research is quantitative research with Quasi Experiment design using pre test and post test group design approach. The samples in this study were 90 teenage girls.

**Finding**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Edutainment Booklet</th>
<th>Edutainment Video and Booklet</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Pretest</td>
<td>Mean Posttest</td>
<td>Mean Pretest</td>
</tr>
<tr>
<td>Knowledge</td>
<td>16,3</td>
<td>38,5</td>
<td>16,1</td>
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<tr>
<td></td>
<td>0,000\textsuperscript{a}</td>
<td>0,000\textsuperscript{a}</td>
<td>0,000\textsuperscript{a}</td>
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<tr>
<td>Attitude</td>
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<td>59,7</td>
<td>28,36</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Behavior</td>
<td>34</td>
<td>55,7</td>
<td>37,5</td>
</tr>
<tr>
<td></td>
<td>0,000\textsuperscript{a}</td>
<td>0,000\textsuperscript{a}</td>
<td>0,000\textsuperscript{a}</td>
</tr>
<tr>
<td>Hemoglobin levels</td>
<td>12,18</td>
<td>12,29</td>
<td>12,17</td>
</tr>
<tr>
<td></td>
<td>0,014\textsuperscript{a}</td>
<td>0,000\textsuperscript{a}</td>
<td>0,000\textsuperscript{a}</td>
</tr>
</tbody>
</table>

Information: \textsuperscript{a} Uji Wilcoxon \textsuperscript{b} Uji Paired t-test
Based on table 1 on the variable level of knowledge obtained Wilcoxon test results that show \( p < 0.05 \) which means that there is a difference in the influence of knowledge between pretest and posttest on group edutainment booklet. The results of the Wilcoxon test showed \( p < 0.05 \) which means that there is a difference in the influence of knowledge between pretest and posttest in the video edutainment group. The results of the Wilcoxon test showed \( p < 0.05 \) which means that there is a difference in the influence of knowledge between pretest and posttest in video edutainment and booklet groups.

In attitude variable, the result of Wilcoxon test shows that \( p < 0.05 \) meaning that there is difference of attitude influence between pretest and posttest in edutainment booklet group. The result of paired t-test shows that \( p < 0.05 \) meaning that there is difference of attitude influence between pretest and posttest in video edutainment group. The results of the Wilcoxon test showed \( p < 0.05 \) which means that there is a difference in attitude influence between pretest and posttest in video edutainment group and booklet.

In behavioral variable, the result of Wilcoxon test shows that \( p < 0.05 \) meaning that there is difference of behavior influence between pretest and posttest in group edutainment booklet. The results of the Wilcoxon test showed \( p < 0.05 \) which means that there is a difference in behavioral influence between pretest and posttest in the video edutainment group. The results of the Wilcoxon test showed \( p < 0.05 \) which means that there are differences in behavior between pretest and posttest in video edutainment and booklet groups.

In the variable hemoglobin levels obtained Wilcoxon test results showed \( p < 0.05 \) that there is a change in hemoglobin levels between pretest and posttest in the edutainment booklet group. The results of the Wilcoxon test showed \( p < 0.05 \) that there was a change in hemoglobin levels between pretest and posttest in the video edutainment group. The result of paired t-test showed \( p \) value <0.05 which means that there is difference of hemoglobin level between pretest and posttest in video edutainment group and booklet.

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Group</th>
<th>P-Value</th>
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<tbody>
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<td></td>
<td></td>
<td>Edutainment Booklet</td>
<td>Edutainment Video</td>
</tr>
<tr>
<td>1</td>
<td>Knowledge</td>
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<td>31,53</td>
</tr>
<tr>
<td>2</td>
<td>Attitude</td>
<td>29,53</td>
<td>27,53</td>
</tr>
<tr>
<td>3</td>
<td>Behavior</td>
<td>21,77</td>
<td>17,97</td>
</tr>
<tr>
<td>4</td>
<td>Hemoglobin levels</td>
<td>45,32</td>
<td>32,53</td>
</tr>
</tbody>
</table>

Information: \( a=\text{Kruskall Wallis Test} \ b=\text{Anova one way} \)

The result of statistical analysis on knowledge, attitude, behavior and hb level of adolescent girls obtained \( p \) value <0.05. So it means that there are differences in the effectiveness of edutainment booklet, video edutainment and video edutainment and booklet in improving knowledge, attitude, behavior about the fulfillment of balanced nutrition in the prevention of anemia and changes in hb levels.

**Result**

Based on the results obtained scores edutainment video and booklet higher than the group that only get edutainment booklet and edutainment video. This shows that video edutainment media and booklets are more effective than other media. The effectiveness of a medium can be seen from the difference in the average increase achieved. The most effective medium is shown
The effectiveness of video edutainment and edutainment booklets is also seen from the mean rank values of each group seen in video edutainment combined with higher edutainment booklets than other groups.¹³ The use of video edutainment modifications and booklets in the intervention given to young women to the information conveyed will be more impressive in depth, thus forming a good and perfect understanding. Knowledge can be improved by providing education, this is in line with the results of research Buzarudina (2013) shows that counseling can increase youth knowledge.¹³ In addition to visual media in the form of booklets, audiovisual media is also considered more effective against the understanding of balanced nutrition in adolescents. This is reinforced by the statement Notoatmodjo (2007) one of the factors that affect knowledge by providing health education.¹⁴ Good knowledge will encourage a person to display an attitude appropriate to the knowledge he has gained. Based on the existing theory that knowledge can affect one’s attitude, with good knowledge it will manifest a good attitude too. This improvement in attitudes proves that young women have an attitude of receiving information about the fulfillment of balanced nutrition in the prevention of anemia after getting intervention. According to Bertalina (2015) this increase in knowledge and attitudes is derived from the learning process by utilizing all sense devices, of which 13% of knowledge is acquired / channeled through the senses of hearing and 35-55% through the sense of hearing and sight.¹⁵ The level of knowledge of one’s nutritional effect on attitudes and behavior in the selection of food that will ultimately affect the nutritional state concerned. This is in line with Rasouli’s (2010) research that health education programs are able to improve knowledge, attitudes and practices of nutrition fulfillment so as to have a positive effect on nutritional behavior either in children or adolescents or other age groups.¹⁶ Provision of nutrition education in young women is expected to increase the knowledge of young women about nutrition, especially about anemia, and is expected to change the diet so that the nutritional intake becomes better. An open mind and the characteristics of adolescents who are still in the learning phase will indirectly affect their habits. With nutrition education, adolescents will be more familiar with good habits in terms of fulfillment of nutritional intake, so as to practice it in everyday life. Health education is a process that bridges the gap between information and health behavior. Interventions conducted for 3 months not only change knowledge but also can change attitudes and behavior.

The 12-week study and four intervention interventions were able to change the hemoglobin level in female adolescents, especially for those with anemia, as seen in the reduction of anemia in each group, the edutainment booklet group by 20%, the video edutainment group 6.7% and a mix of video edutainment and booklets by 30%. This is supported by research by Peyman et al. (2014) that the provision of three months of balanced knowledge, motivation and nutritional behavior can show significant changes in Hemoglobin levels in anemic female adolescents. Nutrition education interventions have an impact on improving the knowledge, attitudes and behavior of adolescent girls who are iron deficient compared with controls for 3 months of intervention, in addition to an increase in mean rank of hemoglobin levels before and after intervention.¹⁷

**Conclusion**

1. Edutainment booklet has an effect on to increase knowledge of balanced nutrition fulfillment in prevention of anemia in adolescent girls.
2. Edutainment booklet effect on the attitude of fulfillment of balanced nutrition in the prevention of anemia in young women.
3. Edutainment booklet effect on the behavior of balanced nutrition in prevention of anemia in young women.
4. Edutainment booklet effect on hemoglobin levels in young women.
5. Video edutainment has an effect on increasing knowledge of balanced nutrition fulfillment in prevention of anemia in adolescent girls.
6. Edutainment video effect on the attitude of the fulfillment of balanced nutrition in the prevention of anemia in young women.
7. Video edutainment effect on the behavior of balanced nutrition prevention of anemia in young women.
8. Video edutainment effect on hemoglobin levels in young women.
young women.
9. Edutainment booklets and videos have an effect on increasing knowledge of balanced nutrition fulfillment in prevention of anemia in young women.
10. Edutainment booklets and videos affect the attitude of fulfillment of balanced nutrition in the prevention of anemia in young women.
11. Edutainment booklets and videos affect the behavior of balanced nutrition in prevention of anemia in young women.
12. Edutainment booklets and videos affect the hemoglobin levels in girls.
13. Edutainment booklets and videos more effectively increase knowledge about the fulfillment of balanced nutrition in the prevention of anemia.
14. Edutainment booklets and videos more effectively improve attitudes about the fulfillment of balanced nutrition in the prevention of anemia.
15. Edutainment booklets and videos more effectively improve the behavior regarding the fulfillment of balanced nutrition in the prevention of anemia.
16. Edutainment booklets and videos are more effective in increasing knowledge of balanced nutrition fulfillment in prevention of anemia in young women.

**Ethical Clearance**: this study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research title, purpose, participants right, confidentiality and signature.

**Source Funding**: This study done by self funding from the authors.

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**References**


Measurement of Imparted X-Ray Dose to Patients Undergoing Voiding Cystourethrography/ Retrograde Urethrography at University of Maiduguri Teaching Hospital

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²Department of Medical Radiography University of Maiduguri, Nigeria

Abstract

Background: Retrograde urethrography (RUG) is a widely performed examination that involved irradiating radiosensitive organs like testes. It is therefore very important to know the amount x-ray dose imparted to individuals undergoing RUG cases.

Objective: To determine the imparted x-ray dose to patients undergoing VCUG/RUG cases at UMTH.

Method: A prospective study was conducted at UMTH using a prestige fluoroscopy machine with inbuilt DAP meter. The DAP meter was used to measure the imparted x-ray doses to 30 patients that came for RUG cases. Their ages ranged from 14 years to 77 years and weights ranged from 42kg to 73kg. The following technical factors were recorded: tube kilovoltage, focus-to-surface distance, screening time and miliamperage.

Result: The minimum and maximum measured DAPs for the RUG cases were 27.72Gycm² and 12.00Gycm². The mean measured DAP for the RUG cases was 18.32Gycm².

Data Analysis: The data was analyzed using SPSS version 16 statistical software.

Conclusion: The mean measured DAP was higher than reported in literature and also reference levels for UK, but still below those of Norway and NRPB. That meant they were practicing radiation protection in RUG examination but still need optimization to further reduce patient doses.

Keywords: Dose Area Product (DAP) and retrograde urethrography (RUG).

Introduction

Radiation dose from diagnostic radiology gives the highest combined absorbed dose to the populace when compared with other sources that uses ionizing radiation [1] (Suleiman et al., 2014). The International Commission on Radiological Protection and (ICRP) in 2007 reported that 36% of man-made radiation comes from Diagnostic Radiation, including 5% from general X-rays and fluoroscopy. [2] There has been a growing concern regarding the risks of radiation exposure from diagnostic X-ray examinations. At University of Maiduguri Teaching Hospital (UMTH), Voiding Cystourethrography (VCUG)/ Retrograde Cystourethrography (RCUG) is the most frequent fluoroscopic examination of all fluoroscopic examinations performed in both adult and children.

VCUG/RUG is a widely performed examination for radiological evaluation of the urethra and urinary bladder in adult and children done mostly under fluoroscopy. [1] (Suleiman et al., 2014). Radiation dose to patients during VCUG/RUG examination is very high due to screening and the number of projection per examination. Therefore, it is very important to measure the radiation dose to radiosensitive organs like testes since stochastic

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risks (such as mutation) are involved, which have no threshold dose. \textsuperscript{[1, 3]} (Suleiman et al., 2014; Livingstone, Koshy & Raj, 2004).

Ionizing radiation (such as x-rays) can potentially damage living tissues causing serious effects (like mutation). High radiation doses tend to kill cells, while low doses tend to damage or alter the genetic code of deoxyribonucleic acid (DNA) of irradiated cells. The effect is more pronounced in those cells that are rapidly dividing, rapidly growing and immature.\textsuperscript{[4]}

The testes are the site of production of sperm cells (male reproductive gametes) and sperm cells have almost all the above features and hence are very sensitive to x-rays (ionizing radiation). When these organs are being irradiated there is likely, a genetic change in the genetic material (DNA) would be seen and if so, the future offspring(s) of the irradiated person will inherit the abnormal DNA and therefore develop(s) abnormality (mutation).\textsuperscript{[5]}

Diagnostic radiology contributes a large amount of man-made radiation exposure to the human population. Measurement of radiation doses should therefore be given proper consideration with a view to keeping radiation doses imparted to patients “as low as reasonably achievable” (ALARA) with acceptable image quality.\textsuperscript{[1, 2]}

Radiation dose measurement in diagnostic radiology is the cornerstone for setting good practice standards as well as optimizing radiation protection to both staff and patients.\textsuperscript{[6, 7]}

The standard quantities used for dose assessment in radiography and fluoroscopy are Entrance Surface Dose (ESD) and Dose Area Product (DAP).\textsuperscript{[8, 9]}

Radiation doses imparted to patients can be measured using a Dose Area Product (DAP) meter.\textsuperscript{[10]} DAP is a useful quantity, because it can be easily measured. It is not directly related to risk other than that, for the same examination, a doubling in DAP represents a doubling in risk.\textsuperscript{[8, 9]}

Diagnostic Reference Levels (DRLs) are used in conjunction with dose audit, to test whether the average dose used for a particular examination is being restricted as far as reasonably practicable.\textsuperscript{[6, 8, 9]} The x-ray dose imparted to patients undergoing VCUG/RUG examinations at UMTH was not known, since there was no any local diagnostic reference level (LDRL) available. Those of the European countries are: for Norway is 20 Gycm\textsuperscript{2} (1996), for NRPB is 40Gycm\textsuperscript{2} (1996) and for UK is 12 Gycm\textsuperscript{2} (2005).

Hence, this study is aimed at determining the x-ray dose imparted to patients coming for VCUG/RUG examination at UMTH.

**Methodology**

A cross-sectional prospective study was conducted. Data was acquired through direct DAP meter measurements of the radiation dose imparted to consenting male participants aged 14 years and above. This study was performed using a Prestige SI Fluoroscopy machine with an over couch x-ray tube (Ultragen N A, Model number: ZA0UL00A, Serial number: 169533M07 Minimum added filtration: 1.5mmAl at 80kV). The radiation dose imparted to the patients during Retrograde Urethrography (RUG) examination were measured using a DAP meter which is inbuilt in the x-ray tube assembly. The readings from the DAP meter were used to estimate the radiation imparted to patients undergoing the examination. The following parameters were taken during every RUG examination: Focus to Surface Distance (FSD), Thickness of the patients, Age of the patients, Irradiated area, Screening time, the radiation imparted to patients were measured using DAP meter.

**Results**

A total of 30 patients who underwent RUG examination were included in this study. Their age ranged from 14 to 77years (mean age 48.43±17.88years). The range of measured DAP was from 12 Gycm\textsuperscript{2} to 27.72Gycm\textsuperscript{2} (mean 18.32 Gycm\textsuperscript{2}). Patients’ related parameters such as age, weight of the patients along with exposure factors used during the examination were shown in (table 1).

Out of the results, 27.72Gycm\textsuperscript{2} was found to be the highest value among the doses measured by the DAP meter. This corresponds to the patient with the serial number 10, which was exposed with 125kV and 0.5mA for 3.8minutes (228 seconds). While the lowest dose recorded by the DAP meter was 12.00Gycm\textsuperscript{2} which corresponds to the patient with the serial number 5 which was exposed with 115kVp and 0.4mA for 2.5minutes (150 seconds) (Table 1).
<table>
<thead>
<tr>
<th>S/N</th>
<th>AGE (Years)</th>
<th>WEIGHT (Kg)</th>
<th>TUBE POTENTIAL (kV)</th>
<th>TUBE CURRENT (mA)</th>
<th>FLUOROSCOPY TIME (min)</th>
<th>MDAP (Gycm²)</th>
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<td>3.9</td>
<td>23.4</td>
</tr>
</tbody>
</table>

MDAP= Measured DAP

Radiation dose imparted to patients in age group were also recorded and found that the age group 31-40 years received the highest radiation dose (18.74Gycm²) (Table 2). While the age group 21-30 years received the lowest radiation dose (12.04Gycm²).
TABLE 2: VALUES OBSERVED BY AGE GROUP

<table>
<thead>
<tr>
<th>AGE DISTRIBUTION (Years)</th>
<th>FREQUENCY</th>
<th>AVERAGE PATIENT WEIGHT (Kg)</th>
<th>AVERAGE FLUOROSCOPY TIME (min)</th>
<th>AVERAGE MDAP (Gycm$^2$)</th>
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<tr>
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<td>66.00</td>
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<td>15.68</td>
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</table>

A comparison between the measured DAP (MDAP) and the UK/Norway international standards was done and found that the values obtained in the present study were higher than the UK standards. However, some were above and some are below that Norway reference level (Table 3). Only patient with the serial number 5 is exposed within the UK reference level (Table 3). The mean MDAP was found to be 18.32 Gycm$^2$.

TABLE 3: COMPARISON BETWEEN THE MEASURED DAP (MDAP) AND THE UK/NORWAY INTERNATIONAL STANDARDS

<table>
<thead>
<tr>
<th>S/N</th>
<th>AGE (YEARS)</th>
<th>MDAP (Gycm$^2$)</th>
<th>Reference levels of developed countries (Gycm$^2$)</th>
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<tbody>
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<td>16.8</td>
<td>12</td>
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<tr>
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<td>75</td>
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</table>
Discussion

From the results, 27.72 Gy cm\(^2\) was found to be the highest dose measured in this study. This may be as a result of long screening time (3.8 minutes) and also increased mA (0.5) used which will increase the DAP value obtained. It can also be as a result of improper collimation of the irradiated area which will directly increase the DAP value. 12.00 Gy cm\(^2\) was found to be the lowest doses measured in this study. This may be as a result of short screening time (2.5 minutes, is the shortest) which will decrease the DAP value obtained as compare to that obtained above.

The mean MDAP obtained in this study was found to be 18.32 Gy cm\(^2\). There was a significant difference between this and that for international standards (12 Gy cm\(^2\) for UK, 20 Gy cm\(^2\) for Norway and 40 Gy cm\(^2\) for NRPB). However, the variation may be as a result of uncertainty in the DAP meter measurements due to the fact that no quality assurance programme was conducted to calibrate the DAP meter before conducting this research. Another possibility can be as a result of higher screening times obtained due to complexity of examinations which will also lead to increase values of DAP. It can also be as a result of increase in irradiated area (since no any evidence of collimation in almost all the films taken during the examinations) which will also increase the values of DAP. Furthermore, RUG examination is less frequently performed (once in a week), and since the operators of the machine are intern radiographers, they will not have enough time to gain much and maintain their skills. This will further increased the screening time and hence the increased DAP value obtained here.

Comparing the mean obtained here (18.32 Gy cm\(^2\)) with 3.16 Gy cm\(^2\) obtained by Merkle E., et al., in 1996 showed that a higher radiation dose was obtained in this study. Gyekye et al., in 2009 also found 3.55 Gy cm\(^2\) as the estimated DAP for RUG examination which is also lower than the one found for the present study. Livingstone, Koshy & Raj in 2004 found a range 0.54 Gy cm\(^2\) to 9.87 Gy cm\(^2\) as the estimated DAP which is also lower than range (12 Gy cm\(^2\) to 27.72 Gy cm\(^2\)) for the present study. Their values are all below the reference levels. This may be as a result of the methods they used since some methods (like clamp method) may be comfortable to the patients. The patients will be more cooperative and there may less screening time which results into decrease patients’ dose.

Conclusion

The mean measured DAP was higher than those reported in literature and also reference levels for UK, but still below those of Norway and NRPB. That meant they were practicing radiation protection in RUG examination but still need optimization to further reduce patient doses.

Ethical Clearance: Ethical clearance taken from the ethical clearance committee of the hospital but unfortunately the supporting document is missing due to loss of data.

Source of Funding: Self

Conflict of Interest: Nil

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Prevention and Control of Malaria Measures Used by People of Naulu Tribe in Seram Island Central Maluku Regency

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Abstract

Malaria is still a major global health problem, killing more than one million people every year. The Naulu is one of the remote tribes in Seram Island of Maluku Province which is known to be a malaria endemic area, but the incidence of malaria was reported to be very low. This study aims to describe the Naulu perspective on malaria, causes of malaria, prevention and malaria control efforts. Research method is qualitative research with phenomenology design. Research subjects were people of Naulu, public figure and managing malaria program at primary health centers. To ensure that the people of Naulu do not suffer from malaria, microscopic examination for plasmodium were done with blood sample. The result of microscopic examination of 100 research samples showed only two samples were positive for malaria. The result of indepth interview got habit of society to make efforts of prevention and self treatment of malaria. This habits were gained from generation to generation from their predecessors. Such as using fumes from the dried skin of duku (Lansium domesticum) and consuming bitter foods. Treatment effort uses existing ingredients around the environment that are made independently of them by drinking boiled water of sambiloto (Andrographis paniculata) leaves, papaya (Carica papaya) leaves, or stem bark of pule (Alstonia scholaris R.Br) which reflects the lower incidence of malaria because of these traditional practices.

Keywords: malaria, naulu tribe, prevention, treatment

Background

Malaria is still a major global health problem, killing more than one million people every year. Almost all of these deaths are caused by Plasmodium falciparum, one of four species of malarial parasites that infect humans. The disease is still a significant public health problem worldwide. The World Health Organization estimates that 214 million cases of malaria occur worldwide by 2015. According to WHO, 13.8 million cases are caused by Plasmodium vivax, a parasitic species that predominates Southeast Asia and America continent where it contributes for more than 50% of malaria cases.

World Malaria Report, mentioned that malaria had was reported in 106 countries, even 3.3 billion people in the world lived in areas at risk of contracting malaria. In the world is 216 million cases, of which 28 million cases occur in ASEAN. There are 660 thousand people die every year due to malaria, especially toddlers (86%), 320 thousand of them are in Southeast Asia including Indonesia. During 2005-2013, the case of malaria throughout Indonesia tended to decrease, ie 4,10% (in 2005) to 1,38% (in 2013). In some places, it still showed a high incidence. As many as 80% of cases came from NTT, Maluku, North Maluku, West Papua, and Papua. The five provinces with the highest incidence and prevalence were Papua, East Nusa Tenggara, West Papua, Central Sulawesi and Maluku. Based on the data from the Health Department of Maluku Province, there has been a decrease in malaria cases in Maluku Province in which API was 16,51% in 2013 to 4,98% in 2016.

The prevention of malaria is important because of its enormous impact on human life. Orem, et al. categorized the impact of malaria into three dimensions, namely: health dimension, social dimension and economic dimension. Epidemiological research on the tribal community in India, contributed more than
40% of patients with malaria and more than 65% with *P. falciparum* and more than 50% of deaths caused by malaria (9). Singh’s research (10) in India found that tribal communities were 6% of the country’s total population who contributed more than 20% of the total number of malaria cases. At least 50% of deaths from malaria in India occurred in tribal communities (11). The study of Ganguly, et al (12) found that patients with asymptomatic malaria came from the tribal people.

The Naulu tribe in Seram island in Central Maluku Regency, Maluku Province is known as a traditional community that maintains customary practices consistently in the midst of rapid cultural changes around their environment. People’s habits are hunting and gardening in the forests as well as the work of most of the people. Gardening done from morning until late afternoon before returning to the house, hunting is done from afternoon until the next day. Sometimes two or three days just returned home depending on the catch obtained. According to Marchand (13), malaria is affected by work, behavior, ethnic background, distance from home to forest. The dominant factor for the risk of malaria is the frequency of overnighting in the forest and the distance of the house from the forest. The neighborhood of this community is still surrounded by dense forest, in the vicinity of their housing there are sago, coffee and cacao plants and other plants are quite lush. Forests are known as one of the factors that support the transmission of malaria (14).

The examination of plasmodium by microscopy of 100 people with fever or history of fever in the last three months using blood slides samples, indicating only two people had plasmodium in their blood samples, meaning that only two people who had positive malaria. Over the next month, a blood sample examination of 6 people with fever with temperature 39°C using RDT also showed negative results. This research aims to illustrate the perspectives of Naulu people and measure adopted by them on the causes, prevention and overcoming efforts for malaria infection.

**Material and Method**

The method used in this research is descriptive qualitative method (15) with phenomenology approach, which is a method to explicitly explore, analyze and describe a certain phenomenon as freely as possible from untested estimation (16). The research informants were selected by using purposive and snowball sampling, where the next participant was visited based on information from previous informant that could enrich the information obtained. Informants in this study were the people of the Naulu tribe, community leaders and the manager of malaria program of Primary Health Center that oversees the residence of the Naulu people. The characteristics of the participants selected were people of the Naulu tribe dwelling the research site for more than 5 years, had had malaria or family members had suffered from malaria. The number of samples was based on the information needed to be obtained based on the achievement of data saturation (16). In each group interviews were conducted on four to six people, resulting in a total of 20 in-depth interviews. 6 FGDs consisting of 6-10 people were conducted to obtain data on community knowledge about malaria and community habits in preventing and control the symptoms of malaria.

The collected through indepth interview with semi-structured questions, this technique was done with the aim that informants had the opportunity to express experiences related to the phenomenon being researched. Firstly, the researcher has included an in-depth interview guide, as a guide in finding information from informants, and observation format. The researcher is the native resident who lives and grows up in the place that is very close to the settlement of Naulu tribe so that the researcher will not find any difficulties to reach the place and has no difficulty to obtain data from the research site. To ensure the validity of the data, the researcher conducted data triangulation by means of the interview results validated by observations and secondary data. Data validity is also done by means of the source triangulation through validation with other data sources.

The process of data analysis using the method of data interpretation of nine steps according Collaizi (1978) in Speziale & Carpenter (16). This method was chosen because the analysis step is quite simple, clear and detailed to use in this research.

**Results and Discussion**

**The General Condition of the Naulu Tribe**

The Naulu tribe is one of the tribes who live on Seram Island in Maluku Province which has always been known as a traditional community that consistently maintains customary practices in the midst of rapid
social and cultural changes around their environment. Initially, the tribe resided on the tops of the mountain and was nomadic, but as the population grew and the facilities and infrastructure developed on Seram Island made the community descended to the south coast and joined the Sepa Muslim community since the 1880s (18). People of Naulu assume that the universe is guarded by certain spirits who must be respected in the deeds they do. For example, when installing a trap in a forest to catch animals, they must dedicate betel-nut and tobacco on the side of the trap. Similarly, when going to eat the game in the forest, all who will eat sitting around a place that has been presented food game that has been burned or cooked in bamboo. The big game will be divided in equal portions to all who will eat and excessed one portion equally to be given to the spirit of the slain animal. The portion for that spirit thrown into the four corners of the wind, saying it is theirs (19).

This tribe has a habit of hunting animals in the forest. This habit of hunting is done from the afternoon until the morning, or depending on the game. The dress used during hunting are their customary attire. They also have a habit of farming in the forest or looking for edible or salable forest products to earn money. The settlement of the Naulu tribe is close to the forest. The distance between their houses and the forest is not more than 100 meters. Around their house there are sago palm trees, cacao, coffee and other plants that make residential areas become very dense, in the northern part of their settlement there is dense forest. The temperature average is 26,50C where the average of the maximum temperature is 29,80C and the average of minimum temperature is 23,90C. The average rainfall amounts to 302,5 mm with an average number of rain days of 18 days. The average solar irradiation is 56.0% and the relative humidity is 85.6% (Central Bureau of Statistics of Central Maluku District, 2014).

The exact statistics figures are not known, as many cases occur in rural areas where people do not have access to the Public Health Centre or hospitals and thus they do not get health care, so that many cases cannot be documented (20). Various efforts have been done by the government and related agencies to prevent and cope with malaria disease but the case is still often happening especially in malaria endemic area. This last condition shows that there is tendency of a decrease in overall national burden, although there is an increase in some areas (21).

Prevention on Malaria

The people of Naulu know that malaria is caused by the bite of a malaria mosquito, but the symptoms do not appear immediately. Malaria symptoms appear when their body condition is less fit or the body’s resistance is decreasing. The immune system of the patient affects the appearance of clinical symptoms in patients with malaria. In endemic areas, adults and older children usually show minimal symptoms and death usually occurs in younger children due to severe anemia (22). This is possible due to the lack of basic immunity from continuous exposure to malaria plasmodium.

Realizing their environment and habits at risk of malaria, the people of Naulu tribe have a habit to prevent malaria. They consume bitter food as it can increase their resistance to malaria attack. A kind of food that is often consumed is papaya (Carica papaya) leaves and flowers that are boiled. In addition, the papaya leaves are also pounded to get the distillation, drunk by adding honey and yolks. Kovandan et al. (23) mentioned that the extract of papaya leaves showed good activity against plasmodium. To prevent themselves from mosquito bites, the people of Naulu have made prevention efforts in the form of indoor residual spraying (IRS). The IRS effort is not done as a paramedic does, but it is done by bloating their house by burning duku dried skin (Lansium domesticum) in the late afternoon.

Another phenomenon that researchers got is from the habits of the community in the form of hunting that no matter how many games they get, they will consume them immediately. Another food that also becomes their favorite is sago worms. They will be willing to exchange other meals if there are sago worms. The result of the study of Bustaman (24) showed that sago worm is one source of protein because it contains protein by 13.80%, fat by 18.09%, and water by 64.21% or higher than the protein content in eggs and slightly lower than the protein content in meat. This habit can lead to high blood protein of the Naulu people so they have improved immunity.

Overcoming Malaria

Associated with the treatment of the Naulu people against malaria, plants and parts of plants often consumed to treat malaria are papaya (Carica papaya) leaves, sambiloto leaves (Andrographis paniculata) or bark of pulai tree (Alstonia scholaris R. Br). Each part of the plants is processed by boiling, then the boiled water...
is drunk to reduce the symptoms of malaria. According to Zein et al., (25) the sambiloto leaves (*Andrographis paniculata*) has showed to be non-toxic and can eliminate fever and can enhance immunity with the effect of increasing leukocyte phagocytosis, increasing CD4+ and T lymphocytes and destroying plasmodium. The bark of the pulai tree (*Alstonia scholaris R. Br*) has been investigated to be antiplasmodial although it can not be recommended as a substitute for quinine and other cinchona alkaloids.

The study of Birhanu et al. (21) revealed that the behavior of seeking treatment for febrile illness is quite high in the community of malaria endemic areas, but the habit of seeking immediate care to a Public Health Centre is still very limited. This may be done because everyone, in general, has the motivation and enough ability to keep their health and overcome the disease themselves.

**Conclusion**

The low of malaria incidence in the Naulu tribe is not caused by people do not access health services but more caused by the habit that has been done for generations to prevent and overcome malaria disease using local wisdom; consumed bitter food as papaya leaves and flowers, burning duku dried skin in the late afternoon for prevented them from mosquito bites. Papaya leaves, sambiloto leaves or bark of pulai tree. Each part of the plants is processed by boiling, then the boiled water is drunk to reduce the symptoms of malaria

**Conflict-of-Interest:** the researcher has no conflict of interest with research informants and related parties at the study site or with other parties related to this research.

**Ethical clearance:** This study is voluntary. Before engaging in research, respondents are asked for their approval and signed informed consent.

**Source of Funding** – Self funding

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Social Determinants of Long Acting and Permanent Contraceptive Method Use In Indonesia

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Abstract

Objectives: To examine social determinants of long acting and permanent contraceptive method (LAPM) use among currently married Indonesian women aged 15 to 49 years.

Method: Data were derived from a cross-sectional study in Tuban, Kediri, and Lumajang District (East Java Province) and Lombok Barat, Lombok Timur, and Sumbawa District (West Nusa Tenggara Province). Information was obtained from 5,930 respondents using a structure questionnaire. We estimated adjusted odds ratios to evaluate for social determinant factors associated with LAPMs use using multivariate logistic regressions.

Results: The prevalence of LAPMs use was 19%. The odds of LAPMs use among women who paid transport cost were higher than that among women who paid none. Similarly, LAPMs use were positively associated with LAPMs availability, encouragement to use LAPMs, perceived distance, knowledge about LAPMs, desire to have no more children, and contraceptive decisions jointly with husbands.

Conclusions: Our findings demonstrate the relatively low level of LAPMs use among currently married Indonesian women, and highlight social determinants that influence women to choose LAPMs. Further studies are warranted to include health provider perspective as well as collecting qualitative data in order to adequately assess behaviors of women associated with LAPMs use.

Keywords: Contraception; Long acting and permanent methods; LAPMs; Family planning

Introduction

Indonesia’s family planning program was once recognized as one of the most successful programs in the world. However, modern contraceptive prevalence rate (CPR) of 57% among Indonesian couples is lower than its neighbors of South Korea (67%), Vietnam (69%), and Thailand (70%).¹ Study showed that among ever married women in Indonesia who use modern contraceptives, 86% used short acting methods —mostly injectables (60%) and oral contraceptive pills (26%) — whereas only 7% used IUD, 6% used implants, and less than 1% underwent female sterilization.²

A large number of studies have demonstrated high efficacy, acceptability and continuation rates of long-acting and permanent methods (LAPMs).³ ⁴ In the Contraceptive CHOICE Project in the United States for example, women aged 14-45 years who used long-acting reversible contraception were 21 times less likely to become pregnant than women using short-acting methods like oral contraceptives.³ Furthermore, a total of 77 %
of the 7,486 women in the study\(^5\) chose a long-acting and reversible method. At 12 months, women who used long-acting and reversible methods of contraception had higher levels of satisfaction and continuation rates than women who used oral contraception.\(^6\)

Some studies have highlighted a number of factors related to utilization of LAPMs including healthcare providers,\(^7-9\) knowledge about LAPMs,\(^10,11\) and joint contraceptive decision with spouse.\(^10,12\) Little is known about the factors associated with LAPMs use in the Indonesian context. Understanding more about what may help women select and retain a form of contraception that suits them is particularly important at a time when contraceptive services are being transferred to local authorities.\(^13\) Given the particularly low use of LAPMs in Indonesia\(^2\), more research is needed to examine factors associated with utilization of LAPMs among currently married women in Indonesia.

**Method**

*Study participants*

Data were derived from a cross-sectional study conducted from March to October 2013 in Tuban, Kediri and Lumajang districts (East Java Province) and Lombok Barat, Lombok Timur and Sumbawa districts (West Nusa Tenggara Province). The study was conducted with the approval of the Ethics Committee of Indonesia University Faculty of Public Health, and written informed consent was obtained from all participants. The participants were married women aged 15-49 years. Using a multi-stage cluster design, 50 villages were selected from each district and one neighborhood was randomly selected from each village. In each neighborhood, 40 individuals in East Java and 50 in West Nusa Tenggara were selected randomly for interview. A total of 13,162 women were recruited with participation rate of 97.5%. The present study was based on currently married women who reported using a method of family planning in the previous month before the survey (n=8,503). Out of 8,503 eligible women, we excluded 60 participants who traveled to the contraceptive service provider more than 4 hours and whose contraceptive use was decided by other than spouse. We further excluded 2,453 participants with missing information on the variables we studied. Our final sample for analyses included a total of 5,930 participants.

**Data collection**

Women were interviewed using a structure questionnaire regarding their socioeconomic and demographic characteristics, knowledge and used of family planning, and reproductive history. LAPMs was defined as those methods that prevent pregnancy more than and equal to two years per application (Implants, IUD, male and female sterilizations). Detailed information on LAPMs use was ascertained by asking women the contraception type they had used in the last month prior to the survey. Access to the source of contraception method were assessed by asking respondent’s perception about distance to the service place, transport cost spent for commuting to the service points, and LAPMs availability. The time required to commute to the service place were grouped into quintile to define the perceived distance, and the highest quintile was used as a cut-off point. Perceived distance was near if the time was < 14 minutes, and far if the time was ≥ 15 minutes. Transport cost was defined none if there was no transportation cost needed, while less and more were cut off by mode of amount of money paid for transportation (Rp. 10,000 or USD 0.75). Women were asked regarding the LAPMs availability and whether LAPMs was the most recommended family planning methods. Women assessed whether they satisfied with the family planning services provided in the health care, and the answers were categorized in to three categories: ‘satisfied’, ‘neutral’, and ‘dissatisfied’. Knowledge about contraceptive methods was scored from zero to six, by computing six questions: two about appropriate spacing and limiting methods, and four about long-term LAPMs use (IUD, Implant, female and male sterilization). Desire for children were classified as wanted if the woman reported having wanted to become pregnant, undecided if she was not sure of having wanted to become pregnant, and wanted no more if she did not want to get pregnant. Woman was asked about who decided for her to use the contraception, and the answers were categorized into “herself” if she had an autonomy to decide, “husband” if she did not have an autonomy, and “joint with husband” if they discussed and decided together on contraception use.

**Statistical Analysis**

Associations between LAPMs use and selected social determinants of contraception among currently married woman were examined in terms of odds ratio
and 95% confidence interval, which were obtained from logistic regression analysis. Statistical adjustment was made for age (mean), education level (not complete primary, complete primary, and complete secondary and higher), residence area, wealth index (poor, middle, and rich), and parity (nulliparous, primiparous, and multiparous). A two-sided *P*-value <0.05 was considered as statistically significant. Statistical analyses were calculated using SPSS software (SPSS, Inc., version 15).

Results

Nineteen percent of currently married woman participated in the present study chose one of the three LAPMs (7.8% implant, 7.6% IUD, and 3.5% female sterilization). More than half of women were not able to correctly answer three out of six questions regarding contraceptive methods (Figure 1). Only 47% of women mentioned LAPMs as appropriate for limiting childbirth, whereas 78% identified injectables and oral pills as appropriate spacing methods. In addition, only a few women understood male and female sterilization as LAMPs, the proportions were 29% and 39%, respectively (data not shown).

We further examined associations between LAPMs use and selected social determinants of contraception among currently married women (Table 1). The odds of LAPMs use among women who paid transport cost for commuting to service point were markedly higher than that among women who paid none. Similarly, there were significant positive associations of LAPMs availability, encouragement to use LAPMs, perceived distance, and knowledge about LAPMs with LAPMs use among currently married women. Conversely, women who satisfied with provider service had significantly lower odds of LAPMs use relative to women who were not satisfied. The odds of LAPMs use in women who did not want more children were significantly higher compared to those who did. Moreover, women who made contraceptive decisions jointly with their husbands had a higher odds of LAPMs use compared with women who made decisions alone.

Discussion

In the present study the low use of LAPMs (19%) among currently married Indonesian women was similar with the previous findings showing that LAPMs were the least utilized methods of contraception.14,15 Results from the study in three regions including Asia have suggested that the limited use of LAPMs was driven primarily by a more substantial role in the provision of short-acting methods other than LAPMs.16 In addition, the present findings also implies a significant effect of methods availability on LAPMs use. One study showed an increased in modern contraceptive use across 113 countries when more methods were available to a large portion of the population.17 Interestingly, it is likely that financial matter, such as transport cost, was taken in to account when participants decided to use LAPMs. Furthermore, greater distance to the service provider (measured in relation to travel time) tended to promote greater odds of LAPMs use. Use levels for IUDs and female sterilization that were dependent on travel to clinics rise as travel time increases among currently married women in the Philippines.18

In Indonesia midwives are the main providers of contraception since the Village Midwife Program was introduced in 1989 by the government. The program’s primary goals were not only to improve the use of family planning services but also to enhance the mix of contraceptive products available to target populations.19 As previously noted, the village midwives in Indonesia influenced women to switch from pills to injectable contraceptives as opposed to switching to LAPMs.19 The relatively infrequent use of LAPMs may indicate the midwives in Indonesia have not been effectively advocated for these methods of contraception. Therefore, it was likely that women in the present study addressed only the quality of short-acting contraception methods served by the health care provider since LAPMs were not commonly used in Indonesia.2

Knowledge of different contraceptive methods is an important factor in a woman’s choice of LAPMs.10,11 The present findings were in line with previous studies showing that the low use of LAPMs were attributed to women’s lack of knowledge as well as their misperceptions about the methods.20,21 The findings from a study among young women aged 15-24 years showed that one third of women had a lack of knowledge about IUD-related amenorrhea and they would not use the IUD.20

In the present study, an increased use of LAPMs associated with desire for no more children was consistent with findings from the previous studies.22,23 Interestingly, the joint contraceptive decision-making with husband had also increased the LAPMs use even
though less than half (42.3%) of women received support from their husbands to use LAPMS. This suggests that there is a need of increasing spousal communication on family planning, particularly on the LAPMs use. Although men were reported as less involved in deciding which method to use and showed reluctance to discuss about contraception, the importance of communication between spouses regarding the LAPMs use have been emphasized in these studies.\textsuperscript{10,12}

Advantages in the present study were the large size of the study population, systematic consideration of important social determinants of contraception, and the high participation rate (97.5%). However, information about family planning collected only from married women in reproductive age was a limitation in the present study. In addition, we could not establish a cause-effect relationship between the social determinant factors of contraception and LAPMs use due to its cross-sectional design. We attempted to control for potential confounders of known factors in the multivariable analysis.

Table 1. Associations between social determinants of contraception and LAPMs use among currently married Indonesian woman.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n(^*) (%)</th>
<th>OR (95% CI)(^+)</th>
<th>OR (95% CI)(^\dag)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceived distance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Near</td>
<td>1901 (32.1)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Far</td>
<td>4029 (67.9)</td>
<td>2.74 (2.32-3.24)</td>
<td>2.72 (2.29-3.24)</td>
</tr>
<tr>
<td><strong>Transport cost, Rupiah</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1897 (32.0)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cheap</td>
<td>3025 (51.0)</td>
<td>1.92 (1.61-2.30)</td>
<td>1.86 (1.54-2.24)</td>
</tr>
<tr>
<td>Expensive</td>
<td>1008 (17.0)</td>
<td>5.86 (4.81-7.14)</td>
<td>5.57 (4.53-6.86)</td>
</tr>
<tr>
<td><strong>LAPMs availability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not available</td>
<td>1615 (27.2)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Available</td>
<td>4315 (72.8)</td>
<td>5.26 (4.20-6.59)</td>
<td>4.38 (3.47-5.53)</td>
</tr>
<tr>
<td><strong>Encouragement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short acting LAPMs</td>
<td>3554 (59.9)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>2376 (40.1)</td>
<td>4.15 (3.60-4.78)</td>
<td>3.75 (3.24-4.35)</td>
</tr>
<tr>
<td><strong>Satisfied with provider service</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>39 (0.6)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Neutral</td>
<td>271 (4.6)</td>
<td>0.27 (0.13-0.58)</td>
<td>0.29 (0.14-0.63)</td>
</tr>
<tr>
<td>Satisfied</td>
<td>5620 (94.8)</td>
<td>0.44 (0.23-0.86)</td>
<td>0.46 (0.23-0.91)</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor (&lt;4)</td>
<td>3057 (51.5)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Good (≥4)</td>
<td>2873 (48.5)</td>
<td>2.56 (2.23-2.94)</td>
<td>2.19 (1.89-2.53)</td>
</tr>
<tr>
<td><strong>Desire for children</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wants another</td>
<td>2688 (45.3)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Undecided</td>
<td>367 (6.2)</td>
<td>0.96 (0.70-1.32)</td>
<td>0.97 (0.70-1.34)</td>
</tr>
<tr>
<td>Wants no more</td>
<td>2875 (48.5)</td>
<td>1.66 (1.34-1.97)</td>
<td>1.48 (1.21-1.81)</td>
</tr>
<tr>
<td><strong>Decision for contraceptive use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>3913 (66.0)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Husband</td>
<td>108 (1.8)</td>
<td>1.36 (0.82-2.34)</td>
<td>1.25 (0.75-2.08)</td>
</tr>
<tr>
<td>Joint with husband</td>
<td>1909 (32.2)</td>
<td>1.82 (1.59-2.09)</td>
<td>1.73 (1.50-2.00)</td>
</tr>
</tbody>
</table>

\(^*\)Number of participants.
Figure 1. Knowledge about LAPMs among currently married Indonesian women

Conclusion

We concluded that in order to increase the uptake of LAPMs, more actions should be taken by encouraging women to choose LAPMs, discussion between partners about LAPMs, and improving women’s knowledge about LAPMs. We suggest that further studies could include health provider perspective to understand determinant of LAPMs use as well as collecting qualitative data in order to adequately assess behaviors of women associated with LAPMs use.

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Competing Interests: The authors declare that they have no competing interests.

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Obstacles of Food Label Policy Implementation on Food Micro, Small and Medium Enterprises (MSME) in Jakarta and Semarang

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Abstract

Background: Food labels have an important role on consumers’ decision making when purchasing a product. The government has set various policies in an effort to ensure food safety through correct and clear labeling, including Regulation Number 18 in 2012 regarding Food. However, implementation of these policies is not optimal and many violations occur especially in Micro, Small, and Medium Food Enterprises (MSME). This research aimed to analyze the factors that affect the implementation of food labeling policies in food MSME in Jakarta and Semarang, Indonesia.

Method: This is a qualitative study aimed at identifying stakeholders’ views through in-depth interviews and Focused Group Discussions (FGD). Content analysis was performed to determine the thematic phenomena, in addition to observation of 12 MSME products in Jakarta and 7 products in Semarang as a form of triangulation to maintain data validity. The analysis was detailed by framework implementation of Edward III policy which includes four variables that affect the implementation of a policy, namely communication, resources, disposition, and bureaucracy structure.

Results: Observations of MSME food labels revealed major violations in Jakarta (91.6%) and Semarang (85.7%) as production codes were not printed on the labels. This low rate of policy implementation was caused by the lack of government support which limited socialization frequency, resource allocation, monitoring and evaluation that also affected coordination across sectors, causing a low success rate of the monitoring and maintenance program for food MSME.

Conclusions: Implementation of food labeling policies in food MSME in Jakarta and Semarang is not optimal as proven by the high rate of violations towards items to be posted on food labels. In response, the government should enhance the frequency of communication, resource allocation, monitoring and evaluation, as well as coordination across sectors to ensure optimum implementation of the policy in Jakarta and Semarang.

Keywords: Food labels, policy implementation, food MSME

Introduction

Food safety is part of human rights for a healthy life. This is mentioned in Regulation Number 36 in 2009 regarding Health, which states that food and drinks to be consumed by humans must meet health standards and conditions. This law requires that food and drinks that fail to meet certain standards, health conditions, and/or endangers health should not be distributed, removed from distribution, have their license revoked and confiscated to be destroyed. Therefore, an effort to fulfill safety standards is important for Small, Micro, and Medium Food Enterprises (MSME). One possible approach is to implement the food labeling policy. The government has established various labeling policies including Regulation Number 18 in 2012 regarding Food in an effort to ensure food safety by printing correct and clear information on food labels. Yet, its implementation in the field is not optimum, as there are many violations that occur especially by food MSME.
Food label is an important factor that affects a consumer’s decision when purchasing a food product and their trust towards food safety. In anticipation of a food labeling violation, the Indonesian National Agency for Drug and Food Control (NADFC) performs food label monitoring through NADFC Hall in Indonesia. Especially for the home food industry (PIRT), monitoring is done by NADFC, involving the local health government body. Monitoring in 2015 and 2016 showed that highest number of labeling violations was found in Semarang, and the lowest in Jakarta.

The author chose Semarang for this research with the consideration of the number of labels being monitored. This location has the highest number of violations compared to other regions. Jakarta was chosen as a region for branch-marking with the lowest number of violations. High number of incorrect labeling may be caused by several factors. Some primary obstacles in implementing this policy include the lack of monitoring and evaluation, poor government system, lack of budget and resources, and organization culture.

This research aims to analyze the obstacles faced in implementing food labeling policies in food MSME in Jakarta and Semarang from the aspects of communication, resources, disposition, and bureaucracy structure.

Research Method

This research was conducted from February to April 2018 in Jakarta and Semarang. A qualitative approach was adopted to identify stakeholder perception through an analysis of the factors affecting the implementation of food labeling policies, including communication, resources, disposition, and bureaucracy structure. Data was collected using in-depth interviews with informants from NADFC, NADFC Hall Jakarta and Semarang, Central Jakarta Regional Public Health Services, and Semarang Public Health Services. In addition, focused group discussion (FGD) was also conducted with food MSME owners in Jakarta and Semarang. Subsequently, content analysis was performed to identify the thematic phenomena, followed by a direct observation of 12 food MSME in Jakarta and 7 in Semarang as a form of triangulation to maintain data validity.

Research Results

Informant Characteristics

Twenty nine informants participated in this study. In-depth interviews were conducted with 8 informants, including 1 key informant from NADFC (BPP), 2 from Jakarta NADFC Hall (BBJ), 2 from Semarang NADFC Hall (BBS), 1 from Central Jakarta Regional Public Health Services (SDKJP), and 1 from Semarang Public Health Services (SFP-KS). There were 22 people who participated in the FGD, 15 were MSME owners in Jakarta (OIJ) and 7 from Semarang (OIS).

An Analysis of the Food Labeling Policy Implementation in Food MSME

An Analysis of MSME Food Labels

Appropriateness analysis is based on direct observation of labels brought by food MSME owners from Jakarta and Semarang during FGD, which included an explanation that food labels should contain product name, composition, weight/net weight, producer name and address, production code, expiry date, and license number. Analysis was performed on 19 food products, 12 from Jakarta, with 11 (91.6%) containing violations, while 6 out of 7 (85.7%) from Semarang also violated existing labeling policy. Analysis showed that the food labeling policy violation rates in Jakarta and Semarang are still high. The majority did not have production codes, 75% in Jakarta and 85.7% in Semarang. The number of labeling violations of food MSME in Jakarta and Semarang are shown in Table 1.

<table>
<thead>
<tr>
<th>Food Labeling Violation</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jakarta</td>
</tr>
<tr>
<td>No product name</td>
<td>16.7</td>
</tr>
<tr>
<td>No composition</td>
<td>16.7</td>
</tr>
<tr>
<td>No weight/net weight</td>
<td>50</td>
</tr>
<tr>
<td>No producer name and address</td>
<td>8</td>
</tr>
<tr>
<td>No production code</td>
<td>75</td>
</tr>
<tr>
<td>No expiry date</td>
<td>50</td>
</tr>
<tr>
<td>No license number</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: observation of MSME food labels
The results of this research are similar to previous studies where all home food industry owners did not have proper food labeling. The majority of violations were in not printing the production code. Other studies have also shown that rates of labeling violations on imported food products in Bosnia and Herzegovina are still high.

Analysis of the Variables Affecting Food Labeling Policies

From the in-depth interviews and FGD, this research has identified various obstacles faced in the implementation of food labeling policies, including communication, resources, dispositions, and bureaucracy structures.

Communication

The different aspects of communication researched include transmission, clarity, and consistency. Transmission of food labeling policies from the NADFC Hall in Jakarta and Semarang, Central Jakarta Regional Public Health Services, Semarang Public Health Services, and food MSME have been carried out, but not optimally. This is caused by the lack of socialization on labeling policies that contribute to poor understanding of food MSME owners. Additionally, socialization by public health services through PKP is only aimed at new enterprises registering for a food distribution license. This was expressed during the interview and FGD, as quoted below:

“…Yes…it is very less from ideal to improve food MSME understanding…” (SDKJP)

“…Only once a long time ago in 2013…” (OIS)

To improve food MSME understanding regarding food labeling policies in Jakarta and Semarang, NADFC and the local public health service should allocate resources to add the frequency of socialization. Budget allocation is a key factor in the success of policy implementation. The results of this research are in line with the argument that failure in policy implementation in developing countries may be caused by the lack of resources.

Resources

Resource aspects that were researched include funding, resources, and facilities. From the funding aspect, all informants from Jakarta and Semarang stated that the funds to support food MSME monitoring and evaluation were sufficient. From the human resource aspect, the number of staff providing the education was limited. This was expressed in the interview, as quoted below:

“…There are not enough people because the area monitored in large. There is inspection of the production facility, distribution facility, labels, advertisements, and it is reported to us…” (BPP)

The lack of human resources affects the performance, especially monitoring and maintenance of food MSME. The results of this research are in line with the argument that failure in policy implementation in developing countries may be caused by the lack of monitoring. NADFC and the public health service centers in Jakarta and Semarang are expected to make the human resources available work more efficiently by providing training, increasing funding, frequency of socialization, and coordination across sectors. Facilities supporting the monitoring and maintenance programs in Jakarta and Semarang are sufficient.

Disposition

Disposition aspects researched include attitude and commitment of policy enforcers. All the informants from Jakarta and Semarang had similar attitude of supporting the food labeling policy. Support from the
NADFC and public health service centers were given by making monitoring and maintenance of MSME food labels as a Key Unit Indicator. However, MSME in Jakarta and Semarang felt that the support given by the policy enforcers, including NADFC and the public health centers, were not sufficient. This is because of the lack of awareness of the MSME in implementing the food labeling policies. This was expressed during the FGD, as quoted below:

“…So, I am just saying that this labeling is not an issue to our community, so we also are busy and think that even if we want to follow the rules, how big is the impact of not having the label? Even if it is MSME. Why? Because the government does not want to facilitate how to sell? They just show how to do it…” (OIJ)

The government organizations as the first line should have strong support and commitment to implement food labeling policies. Support from the government along with high commitment, including from just law enforcement towards the food MSME who violate labeling regulations. This is in agreement with the theory that law enforcement is effective in reducing the number of food labeling violations. Additionally, stronger socialization and training is expected to ensure clear message transmission from the government to the food MSME regarding the importance of labeling. Food labeling training is one way of increasing the knowledge and understanding of the industry regarding food safety, though the government should still be active by increasing the frequency of facility supervision to discuss food safety.

**Bureaucratic Structure**

Aspects relating to bureaucratic structure that were researched include mechanism and fragmentation. From the aspect of mechanism, all informants from Jakarta and Semarang had standard operating procedures (SOP) for MSME monitoring and guidance. The presence of SOP is related to the theory which stated that it can help communication between policy enforcers to ensure that aims and objectives of a policy is attained. However, almost all food MSME in Jakarta and Semarang state that the monitoring program is not performed well by NADFC and the public health service centers. This was expressed during the FGD, as quoted below:

“…Hall and public health service center also don’t monitor. They just give information… …” (OIJ)

“…Yes ...honestly, we only monitor and evaluate if there is a case. If not then... when there is new product or extension of the license. Seems like... because there is lack of human resources. So, to monitor, sometimes we don’t have people …” (SFP-KS)

If linked to the theory, monitoring is important to identify gaps between stakeholders. The infrastructure should be supported by a monitoring and evaluation mechanism, by providing multi-sectoral platforms that may be used to strengthen coordination between stakeholders. From the fragmentation aspect it is known that the responsibility to education the MSME is widespread across sectors throughout Indonesia, through according the informant from the Central Jakarta Regional Public Health Service Center, there is no technical team developed to deal with food MSME as each sector has their own programs. This is proven as there has been no coordination between sectors to synergize the maintenance of MSME. The results of this research are similar to the previous studies which show that the lack of coordination across sectors is an obstacle faced in the implementation of policies. President Instruction Number 3 Year 2017 identified NADFC as the coordinator to improve effectiveness of food monitoring by working together with several stakeholders including the public health service centers. It is hoped that this instruction would trigger NADFC to strengthen their infrastructure, communication, and coordination across sectors.

Based on the results, here are obstacles faced in the implementing of food labeling policies in Jakarta and Semarang, including communication, resources, dispositions, and bureaucracy structures.
Tabel 2: Obstacles faced in the implementing of food labelling policies in Jakarta and Semarang

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>lack of socialization, lack of knowledge and ability of policy enforcers, poor understanding of food MSME owners</td>
</tr>
<tr>
<td>Resources</td>
<td>lack of funding, lack of human resources</td>
</tr>
<tr>
<td>Disposition</td>
<td>lack of awareness of the MSME, lack of law enforcement</td>
</tr>
<tr>
<td>Bureaucratic structure</td>
<td>lack of monitoring and evaluation, lack of coordination across sectors, no technical team to deal with food MSME</td>
</tr>
</tbody>
</table>

Conclusion

Food labeling policy implementation by MSME in Jakarta and Semarang are considerably poor. This is proven by the high number of violations in the food labels printed by the majority of MSME in Jakarta and Semarang. The lack of support from the government limits the frequency of socialization, fulfillment of resources, monitoring and evaluation. This affects the coordination across sectors, causing a low success rate of the monitoring and evaluation program of food MSME. Therefore, the government should strengthen the communication through more frequent socialization of the food labeling policy, monitoring and continuous evaluation, as well as coordination across sectors for proper implementation of the policy in Jakarta and Semarang to be achieved.

Conflict of Interest: The author have no conflicts of interest with the material presented in this manuscript.

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Ethical Clearance: The authors declare there is no any ethical issues that may arise after the publication of this manuscript.

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10. Ko W. ScienceDirect Food suppliersâ€™ perceptions and practical implementation of food


Factors that Influence Nurse Performance in Applying Nursing Assurance in Interview Installation Ratu Zalecha Regional Public Hospital

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Abstract

The success of hospitals in providing quality and professional services is highly dependent on how the nurse’s performance in applying nursing services. The achievement of customer satisfaction on inpatient service in 2015 in RSUD Ratu Zalecha is only 80% from the standard set that is more than 90%. The results of the nursing care documentation show that only 42% of complete nursing medical records are completed. Design study “Cross Sectional”. The samples were 42 female nurses who were assigned to the inpatient installation who had met the inclusion criteria by using simple proportional random sampling method. Data were collected using questionnaire, Reaction Timer, observation sheet and the result was analyzed using Chi Square and multivariate test (logistic regression). Most respondents (66.7%) were > 30 years old, had Diploma III (71.4%), had a working life (78.6%) > 5 years, medium workload (78.6%), fatigue (81%), light work fatigue (71.4%) using Reaction Timer, adequate competence (61.9%), and good performance (73.8%).

The result of bivariate test of workload significantly influenced nurse’s performance with p-value equal to 0.005 (sig value < 0.05), burnout did not significantly influence nurse’s performance with p-value 0.657 (sig value > 0.05), competence significantly influence the performance of nurse with p-value equal to 0.030 (sig value < 0.05). In multivariate analysis of workload and competency of influence significantly to nurse’s performance with p-value equal to 0.001 (sig value < 0.05) and workload is an independent variable having the biggest influence to nurse performance with value of Odds Ratio equal to 11.2.

Keywords: Work load, burnout, competence and nurse performance.

Introduction

Ratu Zalecha General Public Hospital is a hospital belonging to the local government of Banjar Regency with a qualification of class B hospitals that have been accredited plenary in 2017. At Ratu Zalecha General Public Hospital Martapura, based on the report of the strategic plan of hospitals from 2016 to 2021 obtained data that customer satisfaction at inpatient service achievement year 2015 only 80% from satisfaction standard of service to nursing service determined by Health Department that is more or equal to 90%, patient death more than 48 hours that is 0.4% from standard specified <0.24%.1

Fulfillment of Minimum Service Standards in yearly achievement ratio from 2012 to 2015 in Ratu Zalecha Regional Public Hospital average only 90.4% not in accordance with the targeted that is 100%. In the achievement of Bed Occupancy Rate (BOR) indicators, the annual achievement ratio from 2011 to 2015 averaged only 86.3% not in accordance with the targeted of 100% or more. Based on Hospital Quality Indicator data is Bed Turn Over (BTO) year, BTO national standard is 5-45 days. Meanwhile, from Ratu Zalecha Public Complaints Unit report on patient complaints delivered from October 2016 until August of 2017 as many as 77 cases of reports, while complaints on Inpatient Installations delivered as many as 20 cases of reports or 20%, of which about the attitude less friendly officers in communicating with patients2.

Based on result of research conducted Fitria et al.
(2014) in Ratu Zalecha Regional Public Hospital that nurses often experience fatigue and did not work with maximum\(^2\). Based on research from Khairunnisa et al. (2015) in Ratu Zalecha Regional Public Hospital, the result of nursing care documentation showed from 526 patients who underwent hospitalization only 42% from medical record of nursing care which complete and based on data from Medical Record Installation Ratu Zalecha Martapura Regional Public Hospital of 2017 on the completeness of medical record completion recorded by the nurses found that of 1297 inpatient files only 1096 complete files. While the ratio between the number of nurses and beds are 208: 230 in 2015 and 204: 259 in 2017\(^4\). This is reinforced from the calculation of the needs of nurse health personnel conducted in hospitals using the formula from Health Department in 2005, that the calculation of power needs recruitment of nurses and midwives in Ratu Zalecha Regional Public Hospital is still lacking, in 2016 Ratu Zalecha Regional Public Hospital shortage of 54 nurses at inpatient installation and in 2017 lack of 45 nurses\(^2\). Based on the above data it is necessary to research the factors that affect the performance of nurses in applying nursing care.

### Material and Method

The method used in this research is quantitative research with analytic observation design with Cross Sectional, with independent variables are work load, burnout, and competence with dependent variable is nurse performance in applying nursing care. Population in this research is all clinical nurses II which have female genital in charge of Inpatient Installation Ratu Zalecha Regional Public Hospital which amounted 52 people. Samples were taken using proportional sampling method with 41 respondents. Data analysis used univariate, bivariate and multivariate analysis.

### Findings

Based on the results of the study, the obtained distribution of the frequency factors affecting the performance of nurses in Table 1 below:

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Category</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Workload</td>
<td>Weight Medium</td>
<td>9</td>
<td>21,4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33</td>
<td>78,6</td>
</tr>
<tr>
<td>2</td>
<td>Burnout</td>
<td>Weight Medium</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34</td>
<td>81</td>
</tr>
<tr>
<td>3</td>
<td>Competence</td>
<td>Good</td>
<td>16</td>
<td>38,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enough</td>
<td>26</td>
<td>61,9</td>
</tr>
<tr>
<td>4</td>
<td>Nurse performance</td>
<td>Not good</td>
<td>11</td>
<td>26,2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good</td>
<td>31</td>
<td>73,8</td>
</tr>
</tbody>
</table>

Based on the results of the study it is known that the respondents have heavy workload category as much as 9 (21.4%) respondents, 94.9% on average perform direct nursing activities (develop nursing plans in accordance with nursing diagnoses, observe patient condition and perform appropriate action based on observations) and an average of 94% perform indirect nursing activities (conduct discussions among fellow nurses or with superiors as well as with other health teams on patient, development, prepare patient medicines, prepare health support equipment for patients and the nurse carries out proper and correct nursing care reporting and reporting system according to the standard of nursing care.

Based on the result of respondents who have heavy category burnout as much as 8 (19%) respondents, it is known that 65.6% is experiencing weakening of activity and 58.6% on average experiencing weakening of motivation, and 65% experiencing physical attenuation. In attenuation of motivation, nurses who experience severe fatigue sometimes feel hard to think, tire to talk, not concentrate, and anxious to something at work that is as much as 8 (100%) of respondents. While respondents who have moderate fatigue (burnout) are 34
(81%) respondents, it is known that the average of 51% experience weakening of activity and average 42.6% experiencing of weakening of motivation, and 46.9% experiencing of physical weakening.

Respondents who have good competence as much as 16 (38.1%) of respondents, known average 96% have good competence by showing assertive attitude, empathy, and ethics and show compliance toward applying of standard and nursing guidance that is 7 (100%) response. Respondents have enough competence of 26 (61.9%) of respondents, it is known that average 75.9% from competence either by showing assertive attitude, empathy, and ethics that is as much as 17 (65.3%) respondent, respondent show assertive attitude, empathy, and ethics that is as much as 9 (34.7%) of respondents.

Table 2. Analysis of Bivariate

<table>
<thead>
<tr>
<th>Variable</th>
<th>Performance of Nurses</th>
<th>p-value</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Good</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Workload</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Weight Medium</td>
<td>6</td>
<td>54.5</td>
<td>3</td>
</tr>
<tr>
<td>Burnout</td>
<td>1</td>
<td>9.1</td>
<td>7</td>
</tr>
<tr>
<td>Weight Medium</td>
<td>10</td>
<td>90.9</td>
<td>24</td>
</tr>
<tr>
<td>Competence</td>
<td>1</td>
<td>9.1</td>
<td>15</td>
</tr>
<tr>
<td>Good Enough</td>
<td>10</td>
<td>90.9</td>
<td>16</td>
</tr>
</tbody>
</table>

Based on table 2 using Fisher Exact test with 95% confidence level (α) to see the effect of work load on nurse performance in applying nursing care obtained p-value 0.005 <0.05. So it can be concluded that there is influence between work load on nurse performance in applying nursing care, with value odds ratio equal to 11.200. Using Fisher Exact test with level of trust (α) 95% (0.05) to see the influence of fatigue (burnout) to nurse performance in applying nursing care got p-value 0.657> 0.05. So it can be concluded that there is no influence between the work fatigue (burnout) on the performance of nurses in applying nursing care. To see the effect of competence on the performance of nurses in applying nursing care obtained p-value 0.030 <0.05. So it can be concluded that there is influence between competence on nurse performance in applying nursing care, with value odds ratio equal to 9.375.
Table 3 Results of statistical tests of independent variables that affect the dependent variable simultaneously

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>B</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LOWER</td>
<td>Upper</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workload (1)</td>
<td>2.417</td>
<td>1</td>
<td>0.011</td>
<td>11.214</td>
<td>1.733 to 72.551</td>
</tr>
<tr>
<td>Competence (1)</td>
<td>2.240</td>
<td>1</td>
<td>0.063</td>
<td>9.389</td>
<td>0.884 to 99.687</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.261</td>
<td>1</td>
<td>0.136</td>
<td>0.284</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 3 above the lower limit and upper limit of 95% CI that is lower boundary competence of 0.844 and upper limit of 99.687 are respondents who have good competence that shows poor performance of 9.1% compared with respondents who have enough competence showed a poor performance of 90.9%.

**Discussion**

Based on table 3 using Fisher Exact test with 95% confidence level (α) to see the effect of work load on nurse performance in applying nursing care obtained p-value 0.005 <0.05. So it can be concluded there is influence between work load on nurse performance in applying nursing care, with value odds ratio equal to 11,200. The results of this study are in line with the results of Hera et al (2016) study on the effect of dual role conflict, workload and work fatigue (burnout) with the performance of female nurses at Lagaligo Regional Public Hospital, East Luwu Regency with work load variable significantly influence the performance variable of nurse women with p value 0.021. Workload is the limit of the ability of each worker’s body in completing the work. Excessive workload and unbalanced or exceed the capacity of the physical capabilities borne by the nurse will have an impact on the poor productivity of the nurse’s work.

Using Fisher Exact test with level of trust (α) 95% (0.05) to see the influence of fatigue (burnout) to nurse performance in applying nursing care got p-value 0.657 > 0.05. So it can be concluded that there is no influence between the work fatigue (burnout) on the performance of nurses in applying nursing care. The results of this study are not in line with Hera et al’s (2016) study on the effect of dual role conflict, workload and work fatigue (burnout) with the performance of female nurses at Lagaligo Regional Public Hospital, East Luwu Regency with burnout variable significantly influencing variable performance of female nurse with p value 0.025. Burnout is a condition where there is a decrease in efficiency and resilience in work that will lead to decreased performance and increase the level of work errors that will affect the work or productivity work to be obtained.

The effect of competence on nurse’s performance in applying nursing care obtained p-value 0.030 <0.05. So it can be concluded that there is influence between competence on nurse performance in applying nursing care, with value odds ratio equal to 9.375. The result of this research is in line with Muqit research (2014) with the title of influence of competence and job satisfaction on the performance of hospital nurse Syafira Pekanbaru that competence have a significant effect on nurse performance with p value 0.021. The results of this study are also in line with research conducted by Haryanti (2015) with the results showed that employee competence has a significant effect in improving employee performance with p-value 0.022 <0.05.

Competence is an ability possessed by individuals both knowledge and skills supported by work attitude to perform or perform a job or task received. Education closely related to one’s competence, with good competence will increase work productivity.

**Conclusion**

Work load significantly influence the performance of nurses in applying nursing care at Inpatient Installation Ratu Zalecha Regional Public Hospital (p-value 0.005)

Burnout has no significant effect on the performance of nurses in applying nursing care at Inpatient Installation Ratu Zalecha Regional Public Hospital (p-value 0.657).
Competence significantly influence the performance of nurses in applying nursing care at Inpatient Installation Ratu Zalecha Regional Public Hospital ($p$-value 0.030).

Workload and competence significantly influence the performance of nurses in applying nursing care at Inpatient Installation Ratu Zalecha Regional Public Hospital ($p$-value 0.001).

**Ethical Clearance:** This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research title, purpose, participants right, confidentiality and signature.

**Source Funding:** This study done by self funding from the authors.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**References**

The Effect of Quality of Work Life on Organizational Citizenship Behavior of the Employees

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ABSTRACT

The long waiting time for pharmaceutical services may be assumed to be related to the employee performance of which it relates to the quality of work life of the pharmaceutical unit. To support the performance of employees, environment conducive to quality of work life is necessary. A good quality of work life (QWL) may affect organizational citizenship behavior (OCB). This research aimed to analyze the effect of quality of work life on organizational citizenship behavior of the employees of Pharmacy Unit at Gotong Royong Hospital Surabaya. This was the type of observational research using cross-sectional approach. The samples were taken by using saturation sampling as many as 18 employees of Pharmacy Unit at Gotong Royong Hospital Surabaya. The data obtained were analyzed by using simple regression analysis and t-test interpretation analysis for each dimension of quality of work life on organizational citizenship behavior. The findings of this research indicated that quality of work life had a significant effect on organizational citizenship behavior (p-value = 0.001) and an effect of 69.7%. The conclusion of this research was that the quality of work life significantly affected organizational citizenship behavior of the employees of Pharmacy Unit at Gotong Royong Hospital Surabaya.

Keywords: organizational citizenship behavior, quality of work life.

INTRODUCTION

Each organization is established to achieve optimal goals and benefits. In order to achieve these optimal goals and benefits, every organization must be able to take advantage of all its resources. Employees are the most important resource of an organization such as the hospital. The existence of an environment conducive to quality of work life will make the performance of the employees to be better. It is because of the motivation that can support employee performance in the environment conducive. The work environment, which can also be called the quality of work life (QWL), is influential in creating the organizational citizenship behavior (OCB). Organizational citizenship behavior deals with the study of what an individual does within an organization and how the effect of their behavior on organizational performance1. Meanwhile, quality of work life is a pleasant and unpleasant condition in the work environment based on the experience perceived by the individual in the workplace in which it affects his or her work attitude and behavior with the indicators of: a healthy work environment, job security, problem solving, career development, and participation of the organization. A good quality of work life that raises the morale will has a positive effect on improving organizational citizenship behavior2.

According to the previous research, it showed that the quality of work life is an important index indicating the extent to which individuals are able to satisfy their personal needs (such as the need for independence) while working in an organization3. Other studies have shown that there is a positive effect of quality of work life on organizational citizenship behavior2.

The long waiting time for pharmaceutical services in Pharmacy Unit of Gotong Royong Hospital Surabaya may be assumed to be related to the employee performance of which it relates to the quality of work life. Therefore, quality of work life (QWL) and organizational citizenship behavior (OCB) is one of the
most important factors for Gotong Royong Surabaya Hospital in running the performance management.

According to this background, a research was conducted on the effect of quality of work life (QWL) on organizational citizenship behavior (OCB) to the employees of Gotong Royong Hospital Surabaya aiming to analyze the effect of quality of work life on organizational citizenship behavior of the employees of Pharmacy Unit at Gotong Royong Hospital Surabaya.

Organizational Citizenship Behavior (OCB) is defined as a fact of behavior with no reward from the organization, so organizational citizenship behavior occurs without the expectation of reward in giving help. Organizational citizenship behavior is referred to as a cooperative behavior undertaken to support the continuity of the organization and arises without the command of any party/anyone. Organizational citizenship behavior refers to helpful, constructive and useful behaviors by the members of the organization and is valued or assessed by the higher-ranking members of the organizations. However, it is not directly related to individual productivity and unity in terms of implementation of the function or role of individuals within an organization.

There are 5 dimensions of organizational citizenship behavior. The five dimensions are conscientiousness, altruism, civic virtue, sportsmanship, and courtesy. Conscientiousness is a voluntary behavior that is not an employee’s duty or job. This dimension reaches far above and far ahead of a call of duty. Altruism is the attitude of the employees shown by the act of helping to each other; in this case is the co-workers. Civic virtue is a behavior of committing to the organization as a whole which aims to protect the organization. It is shown by the desire to participate actively in the organization. Sportsmanship is the desire to tolerate the inevitable difficulties and the burden of a job without complaining. Courtesy is a behavior that is shown to prevent problems that are related to work and occur in others as well as alleviate problems that are related to the job.

Quality of work life (QWL) is a pleasant and unpleasant condition in the work environment based on the experience perceived by the individual in the workplace in which it affects his or her work attitude and behavior. There are two ways to define the quality of work life (QWL). First, the quality of work life (QWL) is in line with the organization’s efforts in realizing organizational goals such as promotional policies, democratic supervision, employee engagement, and safe working conditions. Second, the quality of work life (QWL) is the employee’s perception to what extent they feel safe, satisfied with their work, and able to grow and develop themselves as human beings.

Walton (1974) mentioned that QWL is worker’s perception of the atmosphere and their experiences in their workplace. Therefore, there are 8 factors affecting QWL as follows:

- A fair and appropriate salary
- Safe and healthy working conditions
- Use of capacities
- Opportunities
- Social integration
- Constitutionalism
- Space that the work occupy in life
- Social relevance and importance of work

Employees who have a high quality of work life will encourage the emergence of organizational citizenship behavior (OCB), because they have greater possibility to speak positively about the organization, willing to help other individuals, have a performance that exceeds the normal estimate. This is shown by other research mentioned that quality of work life is an important index indicating the extent to which individuals are able to satisfy their personal needs (such as the need for independence) while working in an organization.

**MATERIAL AND METHOD**

This was a kind of observational research using cross-sectional approach. It was because the data collection of the variable was carried out within a certain period of time. The population of this research was all Pharmacy Unit employees at Gotong Royong Hospital Surabaya. The samples were taken by using saturation sampling (census) as many as 18 employees with the same number of population and sample.

The data of this research were primary data obtained with the instrument of questionnaire which contained questions related to organizational citizenship
behavior and quality of work life. The dimension of quality of work life were taken based on Walton (1974) consisting of a fair and appropriate salary, safe and healthy working conditions, use of capacities, opportunities, social integration, constitutionalism, space that the work occupy in life, as well as social relevance and importance of work\textsuperscript{8}. In addition, the scales of organizational citizenship behavior were taken based on organizational citizenship behavior dimensions consisting of conscientiousness, altruism, civic virtue, sportsmanship, and courtesy\textsuperscript{5}. The data obtained were then processed by using SPSS program. After obtaining the scores from the total of each dimension, they were tested by using simple regression analysis and t-test interpretation analysis for each of the quality of work life dimensions on organizational citizenship behavior.

RESULTS AND DISCUSSION

Characteristics of the Respondents

The following table shows the characteristic of the respondents who were employees of Pharmacy Unit at Gotong Royong Hospital Surabaya. Table 1 shows that almost all of the respondents (88.9\%) had the gender of female. Women are often considered to have higher OCB level than men based on organizational citizenship behavior components. Women are considered to be more relative to help people and more generous than men. In addition, based on the dimension of altruism, women have an attitude to avoid conflict and promote peace, and have a high desire to help the people around them\textsuperscript{9}. Table 1 shows that the age group of 30 and below is the most frequent group of the respondents. Table 1 also shows that the educational background of the respondents was dominated by senior high school. Employees with educational background of senior high school tend to be more involved in organizational citizenship behavior than those with higher educational background. This may be due to the idea that the higher the level of education, the lower the tendency of an employee to perform organizational citizenship behavior\textsuperscript{10}. That is because the employees with higher education degree will be more focused on task performance because they have a better chance of being promoted\textsuperscript{11}.

Table 1 shows that most respondents had been working in the Pharmacy Unit of Gotong Royong Hospital Surabaya for < 1 to 5 years.

<table>
<thead>
<tr>
<th>Characteristics of the Respondents N=18</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;25 years</td>
<td>4</td>
</tr>
<tr>
<td>≥25 – 30 years</td>
<td>7</td>
</tr>
<tr>
<td>≥30 – 35 years</td>
<td>2</td>
</tr>
<tr>
<td>≥35 – 40 years</td>
<td>1</td>
</tr>
<tr>
<td>≥40 – 55 years</td>
<td>3</td>
</tr>
<tr>
<td>≥55 years</td>
<td>1</td>
</tr>
<tr>
<td><strong>Last Educational Background</strong></td>
<td></td>
</tr>
<tr>
<td>Senior High School</td>
<td>12</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>4</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>1</td>
</tr>
<tr>
<td><strong>Working Period</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>4</td>
</tr>
<tr>
<td>1 – 3 years</td>
<td>4</td>
</tr>
<tr>
<td>3 – 5 years</td>
<td>4</td>
</tr>
<tr>
<td>5 – 10 years</td>
<td>3</td>
</tr>
<tr>
<td>10-20 years</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 20 years</td>
<td>1</td>
</tr>
</tbody>
</table>
Simple Regression Analysis

The results of simple regression analysis are shown in Table 2. From the results of calculation using SPSS program, it then obtained the results of regression equation as the following:

\[ Y = -6.527 + 0.658X \]

From the above regression analysis, it could be explained that:

The constant value was 6.527 and positive in which it could be interpreted that organizational citizenship behavior value before being influenced by independent variable (quality of work life) was negative.

The value of the regression coefficient \( X \) was 0.658 which described that if quality of work life was high or increasing or increased, while other variables remained the same (constant), then the organizational citizenship behavior would increase.

Table 2: The Result of Simple Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>t</th>
<th>Sig.</th>
<th>R</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-6.527</td>
<td>-0.397</td>
<td>0.696</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of Work Life</td>
<td>0.658</td>
<td>3.889</td>
<td>0.001</td>
<td>.697</td>
<td>.486</td>
</tr>
</tbody>
</table>

Based on the significance value in simple regression analysis, it was concluded that quality of work life had an effect on organizational citizenship behavior of the employees. This was indicated by the significance value (Sig.) of 0.001 in which it was smaller than the probability of 0.05. Based on the coefficient determination (R2), it obtained a value of 0.697 in which it could be concluded that the effect of quality of work life on organizational citizenship behavior was equal to 69.7%. It was in line with the other research suggested that there was a positive effect of quality of work life on organizational citizenship behavior\(^2\). A research also revealed that there was a meaningful correlation between quality of work life and organizational citizenship behavior. Employees who have a high quality of work life will encourage the emergence of organizational citizenship behavior (OCB), because they have greater possibility to speak positively about the organization, willing to help other individuals, have a performance that exceeds the normal estimate\(^3,9\).

Table 3: The Result of t-Test Interpretation Analysis of the Dimensions Quality of Work Life on Organizational Citizenship Behavior

<table>
<thead>
<tr>
<th>QWL Dimensions</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Fair and Appropriate Salary</td>
<td>-1.665</td>
<td>.130</td>
</tr>
<tr>
<td>Safe and Healthy Working Conditions</td>
<td>-.752</td>
<td>.471</td>
</tr>
<tr>
<td>Use of Capacities</td>
<td>-2.043</td>
<td>.071</td>
</tr>
<tr>
<td>Opportunities</td>
<td>4.089</td>
<td>.003</td>
</tr>
<tr>
<td>Social Integration</td>
<td>-.080</td>
<td>.938</td>
</tr>
<tr>
<td>Constitutionalism</td>
<td>-.270</td>
<td>.793</td>
</tr>
<tr>
<td>Space that the Work Occupy in Life</td>
<td>5.020</td>
<td>.001</td>
</tr>
<tr>
<td>Social Relevance and Importance of Work</td>
<td>.381</td>
<td>.712</td>
</tr>
</tbody>
</table>

The t-Test Interpretation Analysis of the Dimensions of Quality of Work Life on Organizational Citizenship Behavior

Table 3 showed the results of t-test interpretation analysis of the quality of work life dimensions on organizational citizenship behavior. According to the calculations, t-table was 0.703.

Based on the findings of the research, it could be concluded that the most influential dimensions of quality of work life in the Pharmacy Unit of Gotong Royong Hospital Surabaya were opportunities and space that the works occupy in life. This could be seen in the t-calculate results of the opportunity (4.089) and the space that the work occupy in life (5.020) which were bigger than t-table (0.703) and the significance value was less than 0.005.

Opportunity is one part of the quality of work life that had effect on organizational citizenship behavior. It was because of the opportunities see how the work gives the employees opportunity to use and develop their skills and competences and whether the work poses a challenge for them to fully engage\(^2\). It was evidenced by a research which showed that opportunity is one of the
QWL parts that had the most effective and influential effect on OCB. A research showed that the space that the works occupy in life is part of the QWL that had the most effective effect on OCB. Space that the works occupy in life sees how far the job affects the personal life roles of the employees, such as family relationship. This dimension is a concept of a balanced role related to working hours, career demand, vacation time including leisure and family time.

If all dimensions of quality of work life can be improved and enhanced, then the organizational citizenship behavior in Pharmacy Unit of Gotong Royong Hospital Surabaya will also improve. It will then improve the stability of employee performance as mentioned in the other research.

**CONCLUSION**

The conclusions of this study are:

Quality of work life had strong and significant effect on organizational citizenship behavior. Meanwhile, the most influential dimensions of quality of work life in the Pharmacy Unit of Gotong Royong Hospital Surabaya were opportunities and space that the works occupy in life.

Based on the result of t-test to quality of work life dimensions on organizational citizenship behavior, it is necessary to improve the other dimensions of quality of work life other than the dimensions of opportunities and space that the work occupy in life so as to have effect on organizational citizenship behavior. This should be performed in order to improve the employee performance in the Pharmacy Unit at Gotong Royong Hospital Surabaya.

**Ethical Approval:** Related departments should be assured about the confidentiality of the results of questionnaires

**Conflict of Interest:** The authors report no conflict of interest.

**Source of Funding:** Self

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Baghdad Boil is Reemerging in Iraq

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Abstract

Background: Cutaneous Leishmaniasis is ranked third in disability-adjusted life years among the neglected tropical diseases and second most common insult of parasite-related deaths after malaria.

Objective: to figure out the trend of the Cutaneous Leishmaniasis in Iraq and portray the recent spike that may indicate reemerging of this disease.

Methods: Data was collected from the Department of Health Statistics in the Ministry of Health for the years (2000-2017), double checked and confirmed by data from other health facilities’ registries to fill the blanks and to enhance reliability. It was categorized according to the 18 Iraqi governorates; the total of each governorate was measured for each disease for all the years and then summed to obtain the total for Iraq. The results were conformed to the reports of the WHO, World Bank and UNICEF to define the trend of diseases for each governorate.

Results: A very high spike Cutaneous Leishmaniasis occurred in 2015-16 (p= 0.010). It affected males and females equally, adults (>15 years) more than children, and mostly in the middle and south regions of Iraq.

Conclusion: The findings of this study ring the bells for immediate intervention measures to stop the flare up and spread of this reemerging disease.

Keywords: Baghdad, Boil, Reemerging

Introduction

Cutaneous Leishmaniasis was previously known as “Baghdad boil” for it was highly endemic in Baghdad during the early decades of this century. It is ranked third in disability-adjusted life years among the neglected tropical diseases and second most common insult of parasite-related deaths after malaria.1-3

Leishmaniasis is a poverty-related disease that tends to affect the poorest section of the community, mediated by poor home conditions and environmental sanitation, and lack of personal protective measures.4 On National scale, it is associated with malnutrition, displacement, illiteracy, gender discrimination and lack of resources.5 Although not fatal, Cutaneous leishmaniasis is synonymous with stigma due to its associated disfiguring lesion that affects the social and economic wellbeing of the affected person.6

The estimated global incidence is about 0.7 to 1.2 million per year, it is widely prevalent in the Eastern Mediterranean Region where it is considered endemic in about 18 out of 23 countries in this region,7 and the estimated burden is about 100000 reported cases each year which is the highest burden worldwide, with the actual number estimated to be three to four times higher. Its complex epidemiology and ecology and lack of simple and applicable case management make its incidence data, and hence, its burden in the communities hard to estimate.7,8

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Outbreaks of leishmaniasis are commonly associated with war, human migration and manmade environmental changes following agricultural practices and urbanization. In Iraq, Leishmaniasis (together with Schistosomiasis and Rabies) is among the neglected tropical diseases in the country. Its occurrence was dramatically decremented in the previous period through a comprehensive package of control hold by the Ministry of Health with the support of WHO.

We set this study to figure out the trend of Cutaneous Leishmaniasis in Iraq and portray the recent spike that may indicate the reemerging of this disease.

Methods: We collected morbidity data from the Department of Health Statistics in the Ministry of Health for the years (2000-2017). Data were collected month by month, double checked and confirmed by data from other health facilities’ registries to fill the blanks and to enhance reliability. Data were categorized according to the 18 Iraqi governorates; the total of each governorate was measured for all the years and then summed to obtain the total for Iraq. The results were conformed to the reports of the Iraqi CDC, WHO, World Bank and UNICEF.

The total population for each governorate was obtained from the Central Statistical Organization. The rate of occurrence was plotted against time (for the period from 2000 through 2017) to define the trend of the disease for each governorate.

Data were also categorized by gender and age, and were divided into three main categories: under 5 years, 5 - 15 years, and more than 15 years.

The ethical approvals were taken from the Family and Community Medicine Department, College of Medicine, Mustansiriya University, and the Iraqi Ministry of Health. No verbal consent was needed as we did not identify any patient, we did only treat the biometric patients’ registries.

Results

Following a long period of relatively low (but uncontrolled) incidence of Cutaneous Leishmaniasis, a very high spike occurred in 2015 and continued during 2016 and 2017 (p= 0.010). It affected males and females almost equally, adults (>15 years) more than children, and mostly in the middle and south regions of Iraq as shown in figures (1, 2, 3, and 4). Table (1) shows the distribution of cases for the studied 18 years by age, gender and maximum numbers of cases per year.

Discussion: During the seventieth; Leishmaniasis in Iraq was highly controlled with very sporadic cases. The increase in the number of cases started after the year 2001; the registered cases in 2001 were 625 with a rate of 2.3 /100000, while the rate in 2016 reached up to 45/100000, which means about 20 fold that of 2001. This was likely precipitated by the long economic sanction, and superimposed by the 2003 USA invasion and the years after, mostly attributed to the deterioration in the general and health services including preventive measures and disease control, lack of access to specialist diagnosis and treatment, shortage of medicines, and regressed environmental conditions and sand fly control, particularly following the internal displacement of millions of Iraqis as a result of ISIS overrun to about one third of the Iraqi land.

Cutaneous Leishmaniasis (or Baghdad Boil) usually flourishes up in bad living conditions like poverty, low sanitation, and displacement, which are all made available in many of the Iraqi localities in the last fifteen years due to the devastation in all aspects of life, destruction of the infrastructure and deterioration in the health services. Discontinuation of anti-malaria control programs has played a major role in the upsurge of sand fly density and, hence, the risk of infection.

The trend showed an outbreak every 4-6 years (2004, 2010 and 2015), with males and females almost equally affected, and an insignificant age difference. The outbreak in 2015 registered a very high rate that reached up to 47.5/100000 from a baseline of about 4/100000. This has occurred following the military operations done in the North and West of Iraq, and might be explained by the extensive population movements and migration of a susceptible cohort to the endemic foci, overcrowding, lack of hygiene with poor health services and upsurge in the sand fly and vector population.

Free uncontrolled population movement to and from Iran might also play a role in the frequent outbreaks.
as Iran had a relatively steady trend of Cutaneous leishmaniasis with an average incidence rate of about 25/100000 with the highest rate of 27.5 in 2011.  

The results of the current study showed no much difference between ages or between genders, this disagrees with a comprehensive overview study of Saudi cases of Cutaneous leishmaniasis, where (over 33 years) male cases accounted for 78% against 22% for females and with a study in Turkey where men outnumbered women (61% versus 39%).  

In KSA, 50% of the cases were within the age group (15-45) years, while a Lebanese study described that more than 70% of the cases occurred below the age of 15 years.  

The findings also revealed that there is more clustering of cases in the middle region of Iraq (including the peripheries of the Capital-Baghdad), and the Southern region, where the sanitation is relatively low, the weather is warm and the population of sand flies is large.  

At issue here is to remember that there is a great possibility of underestimation and underreporting of cases in the registries of the Ministry of Health. Many people find this problem too simple to worry about compared to the surrounding life stresses they are experiencing, others may have no money to pay for the treatment which is getting more expensive in the last years, and is not afforded by the governmental health institutions.  

WHO considered Cutaneous leishmaniasis as a major public health concern in the Eastern Mediterranean region necessitating establishing a strategic plan to handle the impact of the problem and achieve an effective program for control.
Table (1): Distribution of Baghdad boil cases for 18 years by age and gender

<table>
<thead>
<tr>
<th></th>
<th>No. of cases</th>
<th>Percent</th>
<th>Max./year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>42857</td>
<td>53.5</td>
<td>10406</td>
</tr>
<tr>
<td>Females</td>
<td>37320</td>
<td>46.5</td>
<td>8448</td>
</tr>
<tr>
<td>Age &lt;5 years</td>
<td>19834</td>
<td>24.7</td>
<td>4224</td>
</tr>
<tr>
<td>Age group 5-15</td>
<td>29177</td>
<td>36.4</td>
<td>6072</td>
</tr>
<tr>
<td>Age &gt;15</td>
<td>31172</td>
<td>38.9</td>
<td>8558</td>
</tr>
<tr>
<td>Total</td>
<td>80177</td>
<td>100</td>
<td>18854</td>
</tr>
</tbody>
</table>

Solitary nodule with central necrosis and ulceration

Conclusion

The findings of this study indicate that there is a reemerging of Cutaneous Leishmaniasis in Iraq after a long period of control, and this rings the bells for immediate intervention measures to stop the flare up and spread of this disease in the time that it should disappear.

Disclosure:

The authors declared no conflicts of interest. The study was not funded by any agency.

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Determinant Factors: Work Productivity of Nurse Practitioner in RSUP Dr. M. Djamil Padang Indonesia in 2018

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¹Master Program of Nursing Faculty of Andalas University, ²Nursing Faculty of Andalas University Padang Indonesia, ³Health Politechnic of Padang

ABSTRACT

Improving work productivity program of nurses in inpatient ward of Central Public Hospital (RSUP) Dr. M. Djamil Padang has shown good results. This condition is happened due to several factors that lead positive impact on the productivity of nurses working in the inpatient ward of RSUP Dr. M. Djamil Padang. This study aims to analyze the factors associated with work productivity of nurses in the dr. M. Djamil Padang in 2018. This study uses descriptive analytical research design with cross sectional study approach. It takes 168 nurses as sample with proportional random sampling. The result of this study is good worker nurse productivity 71%, good organizational characteristic is 81%, good work characteristic is 73% and good organization environment is 71%. In detail, there is a relationship of organizational characteristics, job characteristics and organizational environment with work productivity of nurses in dr. M. Djamil Padang. The writer’s suggestion for service institutions is to maintain and improve a conducive working environment by maintaining or improving the hospital’s managerial system by conducting managerial or leadership training activities.

Keywords: Organizational Characteristics, Job Characteristics, Organizational Environment and Work Productivity

INTRODUCTION

Hospital is a very complex service industry and highly dependent on the capacity and quality of their human resources. Association Productivity Organization (APO) defines productivity as the balance of input and output resulting in efficient and effective performance (1).

According to Schein (1997), characteristic of the organization is the basic pattern accepted by the organization to be able to act and solve problems, forming individuals who are able to adapt to the environment and unify organizational members (2).

This study aims to identify the relationship of organizational characteristics, worker characteristics and organizational environment with work productivity of nurses in the inpatient ward M. Djamil Padang in 2018.

MATERIAL AND METHOD

This study was a quantitative research. The method or design used was descriptive analytic study and using chi-square to know the relation of independent variable and devenden variable and used binary logistic multiple to know the determinant factor.

The population in this study was 528 nurses in Dr. M. Djamil Padang. The sample size was 168 nurses. The sampling technique in this study was proportional random sampling.

As additional data to complete the data will be conducted questionnaires on organizational characteristics, nurse characteristics, organizational environment and work productivity nurses. To measure the work productivity of nurses, the researchers used questionnaire that refers to Nahyeri’s theory (2006) with the 11 items of questions (3). To measure the organizational characteristics and job characteristics, the researcher modified the questionnaire from Kopelmen (1986) in Nursalam (2016) with a total of 12 statement items (4), and 8 statements and to measure the organizational environment using the questionnaire adopted from the PES-NWI questionnaire (Lake 2002).
Test the validity and reliability of the questionnaire conducted in RSUD Dr. Achmad Mochtar Bukittinggi with a total sample of 30 nurses.

**RESULT**

The frequency distribution of the work productivity variable with 71.4% of the work productivity of good nurses, 81% good organizational characteristics, and 73% good work characteristics and 71% good organizational environment.

Table: 1: The relationship between organizational characteristic with work productivity of nurses in the inpatient ward of RSUP

<table>
<thead>
<tr>
<th>Dr. M. Djamil Padang</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Organizational Characteristic</th>
<th>Less Good</th>
<th>Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Less good</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>Good</td>
<td>24</td>
<td>112</td>
</tr>
</tbody>
</table>

Chi-Square test results obtained p value = 0.000 (p <0.05) which means there is a relationship between organizational characteristics with work productivity nurses practitioner. The value of r=15 means that nurses with good organizational characteristics 15 times more impact on the productivity of the nurse work good.

Table: 2: Relationship between work characteristic and work productivity of nurse practitioner in inpatient ward of RSUP Dr. M. Djamil Padang

<table>
<thead>
<tr>
<th>Work Characteristic</th>
<th>Less Good</th>
<th>Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Less good</td>
<td>25</td>
<td>54,3</td>
</tr>
<tr>
<td>Good</td>
<td>23</td>
<td>18,9</td>
</tr>
</tbody>
</table>

Chi-Square test results obtained p value = 0.000 (p <0.05) which means there is a relationship between job characteristics and work productivity nurses practitioner. The value of r 5.0 means that nurses with job characteristic has 5.0 times more impact on good work productivity.
Table: 3: Relationship between organization environment and work productivity of nurse practitioner in inpatient ward of RSUP Dr. M. Djamil Padang

<table>
<thead>
<tr>
<th>organization environment</th>
<th>Work productivity of nurse practitioner</th>
<th>Total</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less good</td>
<td>Good</td>
<td>n</td>
</tr>
<tr>
<td>Less good</td>
<td>37</td>
<td>75,5</td>
<td>12</td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
<td>9,2</td>
<td>108</td>
</tr>
</tbody>
</table>

From table 3, it can be seen that 119 respondents who have good organization environment as many as 119 people (90.8%) are good work productivity and 11 people (9.2%) are poor work productivity. Meanwhile, from 49 respondents with bad organizational environment, there are 12 (24.5%) nurses with good work productivity and 37 (75.5%) with poor work productivity.

Based Chi-Square test results, it obtained p value = 0.000 (p <0.05) which means there is a relationship between the organizational environment and work productivity nurses practitioner. The value of r 30 means that nurses with good organizational environment 30 times more impact on good work productivity.

Table 4: Determinant factor: multivariate candidate selection of work productivity of nurse practitioner in the inpatient ward of Dr. M. Djamil Padang

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>organizational characteristic</td>
<td>0,000</td>
</tr>
<tr>
<td>2</td>
<td>work characteristic</td>
<td>0,304</td>
</tr>
<tr>
<td>3</td>
<td>organization environment</td>
<td>0,000</td>
</tr>
</tbody>
</table>

Based on Table 4, it shows the independent variables included in multivariate modeling showing p value <0.25. So the job character (0.304) which is the variable with the highest value above 0.25 is removed from the multivariate candidate. The results of the analysis can be seen in table 5.

Table 5 Final Stage Multivariate Work Productivity Nurse Practitioner In Inpatient Room Dr. M. Djamil Padang (n = 168)

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>P Value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>organizational characteristic</td>
<td>0,000</td>
<td>9,90</td>
<td>3,07-31,95</td>
</tr>
<tr>
<td>2</td>
<td>organization environment</td>
<td>0,000</td>
<td>21,22</td>
<td>7,91-56,95</td>
</tr>
</tbody>
</table>

Table 5.5 shows that the most variable related to work productivity of nurses are organizational environment variable because it has the smallest value of p value and largest OR so that it can be concluded that work productivity of nurse practitioner controlled by organization environment. If the organizational environment is improved or enhanced, the work productivity of the nurse in general in the nurses in the inpatient ward of RSUP Dr. M. Djamil Padang can be increased by 21 times.

DISCUSSION

Description of Work Productivity of Nurse Practitioner in Inpatient Room of Dr. M. Djamil Padang.

The results showed (71,4%) work productivity of nurse practitioner in inpatient ward of Dr. M. Djamil Padang is good.

Research conducted by Elsa (2014) in Kandau Hospital showed 73% of nurses who have good productivity with sub items of different work productivity statements (6).

Research conducted in Dr. M. Djamil Padang show from 11 statements about work productivity of nurse practitioner distributed through questionnaires found most of the nurses (63.7%) showed good hospital efficiency, most nurses (57.1%) expressed good hospital commitment, and most nurses (54.8%) showed the effectiveness of good hospital.

Description of organizational characteristics in Inpatient Room of Dr. M. Djamil Padang.

The results showed (81%) organizational characteristics in inpatient wards RSUP Dr. M. Djamil Padang are good.
The study conducted by Muadi (2009) states the characteristics of the hospitalization organization installed BRSUD Waled Cirebon with both components of the statement of different organizational characteristics(7).

Research conducted in Dr. M. Djamil Padang from 12 statements about the characteristics of the organization distributed through questionnaires found that almost all nurses (92.9%) expressed good leadership system, almost all nurses (89.3%) showed Goal setting and MBO in both hospitals and almost all nurses (86.3%) showed good organization hospital.

Description of work Characteristics in Inpatient Room of Dr. M. Djamil Padang.

The results showed (73%) job characteristics in inpatient wards RSUP Dr. M. Djamil Padang are good.

The results of this study differ from the results of research conducted by Na Nan ang Pukkeeree (2013) which states that the average score of job characteristics is still not good where the average value of about 3.82 to 3.94 (8).

Research conducted in Dr. M. Djamil Padang from 8 statements about the characteristics of the work distributed through questionnaires found that almost all nurses (91.7%) stated good hospital feedback, almost all nurses (90.5%) stated good hospital performance targets and almost all nurses (86.9%) stated the design of work in hospital well.

Description of Organization Environment in Inpatient Room of Dr. M. Djamil Padang.

The results showed (71%) of the environment in the inpatient ward of Dr. M. Djamil Padang is good.

Research conducted by Amriyati et al (2003) states the organization environment in Banyumas hospital is good with sub items of different organizational environment statement (9).

Research conducted in Dr. M. Djamil Padang from 31 statements about the organizational environment distributed through the questionnaire obtained almost all nurses (91.1%) showed college nurse-doctor relationship in the hospital well, almost all nurses (79.2%) stated employee human resources and skills in the hospital well, and almost all nurses (77.4%) showed nurse managers skills, nurse leadership and nursing support either.

Organizational Characteristics and Its Relationship to Work Productivity of Nurse Practitioner in Inpatient Room of Dr. M. Djamil Padang.

Results of research on the relationship of organizational characteristics with Work Productivity of Nurse practitioner in Inpatient Room of Dr. M. Djamil Padang illustrates that good organizational characteristics have more proportion to increase the productivity of good nurse work for 112 people (82.4%) and 24 people (17.6%) resulted in work productivity of poor nurse practitioner. Statistical test results can be seen that there is a significant relationship (p value = 0.000) between organizational characteristics and work productivity nurses practitioner.

The results of the questionnaire analysis found that the optimal training and development conducted by hospitals where almost half of nurses (45.8%) stated that training and development in hospitals was poor and almost half of nurses (41.1%) stated that the hospital selection system less good where the lowest point nurses declare placement / assignment not in accordance with the profession. This is the factor causing the less good characteristics that impact on the productivity of work nurses are less good implementers.

C. Work Characteristics and Its Relationship to Work Productivity of Nurse Practitioner at Inpatient Room of Dr. M. Djamil Padang.

Result of research concerning relation of work characteristic with work productivity of nurse practitioner in inpatient ward of RSUP Dr. M. Djamil Padang illustrates that the characteristics of good work have more proportion to increase the productivity of good nurse work for 99 people (81.1%) and 23 people (18.9%) to produce work productivity of poor nurse executor. Statistical test results can be seen that there is a significant relationship (p value = 0.000) between job characteristics with work productivity nurses implementing.

The same study also obtained from a study
conducted by Yuxiu, Kunaviktikul and Thungjaroenkul (2011) suggests that there is a significant relationship between job characteristics and work performance at a moderate level ($r = 0.36, p < .01$).

The results of the questionnaire analysis found almost half of nurses (28%) stated that the work schedule determined by the hospital for the poor nurse became the factor causing the bad work characteristics so that the work productivity of the nurses became less good.

D. Organizational Environment and Its Relationship with Work Productivity of Nurse Practitioner in Inpatient Room of Dr. M. Djamil Padang

Result of research concerning relation of organization environment with work productivity of nurse practitioner in inpatient ward of RSUP Dr. M. Djamil Padang illustrates that a good organizational environment has a higher proportion of good nurse productivity increase of 108 people (90.8%) and 11 people (9.2%) produces less good worker nurse. Statistical test results can be seen that there is a significant relationship (p value = 0.000) between the organizational environment with work productivity nurses implementing.

The results of research conducted by Rahman (2015) The influence of work environment on nurse performance significantly and positively related, thus the work environment can affect the performance of nurses which is realized from a nurse attitude that reflects the feeling of love to the existing environment.

The results of the questionnaire analysis found that almost half of nurses (48.2%) stated that nursing field in improving the quality of nursing service was poor and almost half of nurses (28.6%) stated that the participation of nurses in the hospital was not good to be the cause of the poor organizational environment so that the productivity of nurse work becomes less good.

E. Determinant Factor Work Productivity of Nurse Practitioner in Inpatient Room of Dr. M. Djamil Padang

The result of multiple linear regression analysis shows that there is strong correlation ($R = 21.226$ and $p = 0.000$) between organizational environment factor and work productivity of nurse in hospital ward. Mjamil Padang. However, the results of this study is different from previous research, the results of research by Susanti (2014) found from the results of his research that the most dominant factor influential is the management system.

For the research conducted by the researchers themselves found that the organizational environment factor is the most dominant factor found to have an effect on the work productivity of the nurses in the inpatient room of RSUP Dr. M. Djamil Padang.

**RECOMMENDATION**

This research is very important for management in Dr. M. Djamil Padang hospital which is in the scope of nursing service as an effort to improve the work productivity of nursing

**RELEVANCE OF THE STUDY**

This research will produce an overview of the application of Organization characteristic, work characteristic and organizational environment on the work productivity of nursing in hospital, especially in Padang and Indonesia in general.

**CONCLUSION**

Organization characteristic, work characteristic and organizational environment have significant relation with quality of nursing service in Dr. M. Djamil Padang. With the determinant factor is the organizational environment that has a greater factor in affecting the work productivity of the nurses. Therefore, researchers can further explore other factors that affect the productivity of nurses working in hospital

**Conflict of Interest:** No conflict of interest arose in this study

**Sources of Funding:** This study was conducted using a source of funds derived from the researcher himself

**Ethical Clearance:** This study has passed of the medical reseach ethics of the Dr. M. Djamil Hospital Padang Indonesian.

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2. Iqbal M, Agritubella SM, Tinggi S. Hubungan
Exercise, Stress, Cholesterol, and Hypertension as Risk Factors of Type 2 Diabetes Mellitus in South Sulawesi, Indonesia

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Abstract

Background: Indonesia is a developing country with a high prevalence of type 2 diabetes mellitus (DM). Lifestyle behaviours related to type 2 DM cases and studies about its risk factors in Indonesia remain limited. This study aimed to identify the risk factors of type 2 DM in South Sulawesi.

Method: A cross-sectional study was conducted amongst patients undergoing treatment at a centre hospital in south Sulawesi from 2014 to 2016. Data were extracted from medical records. A logistic regression was used to identify the risk factors of type 2 DM.

Result: A total of 1500 patients were included in the analysis. A total of 288 (19.2%) participants had type 2 DM. In the multivariate analysis, we identified exercise (OR 1.84; 95% CI 1.23-2.77; p=0.0030), stress (OR 2.27; 95% CI 1.44-3.57; p=0.0010), total cholesterol level (OR 2.53; 95%CI 1.80-3.56; p=0.0001), hypertension (OR 1.58; 95%CI 1.18-2.14; p=0.0020), education level (OR 0.66; 95%CI 0.51-0.87; p=0.0030), and age (OR 1.02; 95%CI 1.01-1.03; p=0.0070) as significant risk factors for type 2 DM.

Conclusion: The prevalence of type 2 DM in South Sulawesi remains high. Exercise, stress, cholesterol level, hypertension, education level and age were factors that significantly increased the risk of type 2 DM. Health behaviours and knowledge are recommended to prevent the risk of type 2 DM.

Keywords: Risk factors of type 2 DM, Indonesia.

Introduction

An estimated 422 million adults worldwide were living with diabetes in 2014. The prevalence of diabetes has nearly doubled since 1980, from 4.7% to 8.4% in the adult population, and most cases are type 2 diabetes mellitus (DM). The International Diabetes Federation (IDF) reports that the prevalence of type 2 DM in low-middle income countries is increasing. Indonesia is ranked seventh in terms of the most diabetic cases worldwide (10.0 million) and third in terms of people with impaired sugar tolerance.

Complications often occur amongst diabetic patients including heart attack, stroke, renal disease, leg amputation, loss of vision (retinopathy) and neurological disorders. According to the WHO report, 6% of all deaths in Indonesia are caused by diabetes. In addition, diabetes also has a large economic impact on the state and the national health system. This is due to the increased use of health services, loss of productivity and long-term support to overcome diabetes-related complications such as kidney failure, blindness and heart failure.

The prevalence of type 2 DM is higher in urban cities than in rural areas. A study in China reported that the prevalence of type 2 DM is a public health problem, and the increasing number of diabetes cases is due to the rapid transition from a rural to urban lifestyle. Lifestyle has been identified to increase the risk of type 2 DM.

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cases. Low physical activity and occupational stress increase the risk of the incidence of type 2 DM. In addition, dietary fat intake, tobacco use and alcohol consumption were shown to affect the incidence of type 2 DM.

The increasing prevalence of type 2 DM in low-middle income countries shows that without an effective strategy for better management of diabetes, there will be an increase in diabetes complications. In Indonesia, the prevalence of type 2 DM and diabetes mortality remain high. In addition, information about the risk factors of type 2 DM in urban areas is limited. This study aimed to identify the risk factors of type 2 DM in urban cities. South Sulawesi is a useful study site because it has the same characteristics as other urban cities in Indonesia.

Method

A cross-sectional study was conducted amongst adult patients (≥18 years) who registered at Wahidin Sudirohusodo and Unhas hospitals in South Sulawesi between 2014 and 2016. The sample included outpatients and inpatients who have complete data according to the research variables. The data were collected from medical records from July to December 2016. The variables included age, sex, education level, occupation, smoking history, total cholesterol levels, hypertension, exercise, BMI, and stress.

A logistic regression was used to identify the risk factors associated with the prevalence of type 2 diabetes. Variables with a p-value <0.25 were included in the multivariate analysis. Stepwise regression with backward elimination approach was used to find the last model. All analyses were performed using Stata version 12 software.

Ethical approval was obtained from the ethics committee of the Faculty of Medicine, Hasanuddin University (Number: 925/H04.8.4.5.31/PP36-KOMETIK/2016).

Result

Patient characteristics:

A total of 1500 participants were included in the analysis with a median age of 59 years. A total of 19.20% of the participants had type 2 DM. Most (51.33%) were male, and most (54.53%) had a low education level (did not complete senior high school). As many as 61% of the participants had jobs. Nearly a quarter (22.60%) of the participants had a history of smoking. Additionally, 13% of participants had a high cholesterol level and 61% had hypertension (systole ≥ 140 mmHg and diastole ≥ 90 mmHg). Most (83%) of the participants had lack of exercise and had an average body mass index of 27.73 kg/m², and as many as 7% of the participants experienced stress.

Risk factors of type 2 DM:

In the bivariate analysis, variables that had a p-value <0.25 were included in the multivariate analysis. After all variables in the model were selected using stepwise regression with backward elimination, the last model showed that the significant variables were age, education level, cholesterol, hypertension, exercise, and stress. Participants over 59 years old had a higher risk of type 2 DM than that of participants younger than 59 years (OR 1.01, 95% CI: 1.01-1.03). A high education level (completing high school and college education) had a higher risk of type 2 DM than a low education level (OR 0.66; 95% CI: 0.50-0.86).

Participants who had high cholesterol levels (a total cholesterol level ≥200 mg/dl) had a two-fold higher risk of type 2 DM than those with low cholesterol levels (OR 2.76, 95% CI: 1.97-3.87). Participants with hypertension (systole ≥ 140 mmHg and diastole ≥ 90 mmHg) had a higher risk of type 2 DM than those without hypertension (OR 2.45; 95% CI: 1.74-3.45). Participant’s lack of exercise had a higher risk of type 2 DM than those who exercised (OR 1.92; 95% CI: 1.29-2.88). Participants who experienced stress had twice the risk of type 2 DM than those without stress (OR: 2.13; 95% CI: 1.35-3.48).
Table 1. Characteristics of the participants in South Sulawesi, Indonesia.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N= 1500 (n (%))</th>
<th>Type 2 DM n = 288 (%)</th>
<th>Not Type 2 DM n = 1.212 (%)</th>
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<tr>
<td>Age, Median(IQR)</td>
<td>59 years (52-67)</td>
<td></td>
<td></td>
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<tr>
<td>Sex</td>
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<td></td>
<td></td>
</tr>
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<td>727 (48.47)</td>
<td>146 (20.08)</td>
<td>581 (79.92)</td>
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<tr>
<td>Male</td>
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<td>142 (18.37)</td>
<td>631 (81.63)</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>136 (16.63)</td>
<td>682 (83.37)</td>
</tr>
<tr>
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<td>530 (77.71)</td>
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<td></td>
<td></td>
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<td>749 (81.06)</td>
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<td>113 (19.62)</td>
<td>463 (80.38)</td>
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<td>69 (35.38)</td>
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<td>219 (16.78)</td>
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<td></td>
<td></td>
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<td>77 (26.74)</td>
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<td>Yes</td>
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<td>211 (73.26)</td>
<td>714 (58.91)</td>
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<td>Body Mass index (IMT), Mean (IQR)</td>
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<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>339 (22.60)</td>
<td>66 (19.47)</td>
<td>273 (80.53)</td>
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<td>No</td>
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<td>222 (19.12)</td>
<td>939 (80.88)</td>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>991 (79.60)</td>
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<td></td>
</tr>
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<td>33 (30.28)</td>
<td>76 (69.72)</td>
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<tr>
<td>No</td>
<td>1391 (92.73)</td>
<td>255 (18.33)</td>
<td>1136 (81.67)</td>
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</table>
Table 2: Risk factors of Type 2 Diabetes Mellitus amongst participants in South Sulawesi.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariate OR (95% CI)</th>
<th>P-Value</th>
<th>Multivariate OR (95% CI)</th>
<th>P-Value</th>
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<td>1.02 (1.01-1.03)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.12 (0.86-1.44)</td>
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<td></td>
<td></td>
</tr>
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<td></td>
<td>0.0030*</td>
<td></td>
</tr>
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<td></td>
<td>1</td>
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<td>0.66 (0.51-0.87)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.04 (0.80-1.36)</td>
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<td>1</td>
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<td></td>
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<tr>
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<td>0.0020*</td>
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<tr>
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<tr>
<td>Yes</td>
<td>1.93 (1.26-2.98)</td>
<td></td>
<td>1.44-3.57)</td>
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</tbody>
</table>

*Significant

Discussion

We found a high prevalence of type 2 DM (19.20%) amongst patients at Wahidin Sudirohusodo and Hasanuddin university hospitals in South Sulawesi. Likewise, other developing countries have reported high prevalence rates of type 2 DM. In the multivariate analysis, we identified age, education level, cholesterol level, hypertension, exercise, and stress as risk factors of type 2 DM.

Sociodemographic factors including age and education level were identified as risk factors of type 2 DM. The incidence of type 2 DM was higher amongst participants aged > 59 years than participants aged ≤ 59 years. Similar results have been identified in other countries showing that age was a risk factor of type 2 DM. Other studies have shown that the incidence of diabetes increases significantly amongst people 60 to 70 years old.

Education level is related to knowledge of how to prevent illness, choosing one’s own health behaviours, and using the health care system. Previous studies have shown that a low education level is a strong predictor of type 2 DM. In this study, education levels were also identified as predictors of type 2 DM. However,
participants with a high education level had an increased risk of type 2 DM compared to those with a low education level. We reported that most (51.8%) of the participants with a high education level had jobs. People who have jobs consume fast food because of their busy lifestyles. A previous study has shown that fast food consumption more than twice a week increased the risk of a type 2 DM prognosis.14

We found that total cholesterol levels were the strongest risk factor for type 2 DM. Participants with total cholesterol levels ≥ 200 mg/dl had twice the risk of developing type 2 DM than those with total cholesterol levels <200 mg/dl. Similar results were identified in some developing countries showing that total cholesterol levels independently increased the prognosis of type 2 DM.15 Total cholesterol levels directly affect β cell metabolism, which interferes with insulin secretion.16 This study suggests that dietary education is important to prevent type 2 DM, particularly dietary fat intake and dietary fibre intake.17

Indonesia has a high prevalence of hypertension; the Ministry of Health reported that 25.8% of the population was diagnosed with hypertension.18 In fact, the hypertension prevalence may be even higher because most hypertension cases are undiagnosed.19 In this study, hypertension was identified as a risk factor for type 2 diabetes mellitus. Participants with hypertension had 1.5 times the risk of developing type 2 DM compared to those without hypertension. Previous studies have shown that hypertension increases hyperglycaemia, which is a cause of type 2 DM.5,20

Lifestyle was identified as being associated with metabolic disease, particularly low physical activity.8 In this study, we found that the prevalence of type 2 DM cases was higher amongst participants who had lack of exercise. Participants who exercised over 4 hours per week, i.e., walking, cycling, swimming and gardening, had a decreased risk of type 2 DM. A systematic review showed that exercise was a risk factor of type 2 DM.21 This result suggests that risk factors of type 2 DM can be modified to reduce this disease in communities.22,23 Previous studies have found that regular exercise 150 min per week is effective in preventing type 2 DM amongst elderly patients.8,24

Previous studies have also reported that stress is an independent risk factor of type 2 DM.25,26 Our study supports those results that stress increases the risk of type 2 DM. High-level stress (on a 5-point scale) induces hyperglycaemia, which is the cause of type 2 DM and death.27 A previous meta-analysis showed that psychosocial stress at work increases the risk of type 2 DM.6 Lifestyle factors such as diet, physical activity, and psychosocial support are recommended to reduce the risk of type 2 DM.28

Limitations: Our study used secondary data. Patients who did not have complete data for all variables were excluded.

Conclusion

We identified age, education level, total cholesterol level, hypertension, exercise, and stress as factors that significantly increased the risk of type 2 DM.

Recommendation: This study suggested that type 2 DM can be prevented by healthy life behaviours. Healthy life behaviours such as providing healthy food and regular exercise are recommended to reduce risk of type 2 DM. Moreover, government programmes that support providing public spaces for refreshing and exercise are necessary.

Conflicts of Interest: None declared

Source of Funding : Self

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and Meta-Analysis of Prospective Cohort Studies. PLoS One. 2016;11(8); e0159978


Satiation and Satiety in High-fiber Meatball Consumption

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Abstract

One effort to reduce the prevalence of obesity is by increasing the consumption of dietary fiber. Dietary fiber can decrease weight, because it can increase the satiety and prevent excessive calorie consumption. Substitution of banana blossom and mocaf rich in fiber to meatball is expected to be a healthy and fiber-rich food alternative to reduce the prevalence of obesity. The purpose of this study is to determine the acceptance, nutritional content and test the level of satiety of meatballs banana heart products.

This study is a cross-factorial design experiment, 3 best formulas were selected from 7 formulas by 3 trained panelists, then the best formula was selected by 25 untrained panelists. Data were analyzed by Friedman and Wilcoxon test. Nutritional content is calculated using Nutrisurvey. The satiety study used cross-over trial design. 14 subjects were Airlangga University students, aged 17-25 years. The satiety level was taken with a Visual Analog Scale (VAS) questionnaire consisting of hunger and satiety question.

The results of this study indicate that F3 with 20% substitution of banana blossom, and 15% mocaf flour is the best formula in terms of the acceptability and fiber content. Nutrition calculations show that per 100 grams F3 contains 178.9 kcal energy, 29.6 grams of carbohydrates, 13.1 grams of protein, 2.7 grams of fat and 1.6 grams of fiber. There was no significant difference in the value of hunger after eating (p = 0.122) and the value of satiety after meal (p = 0.080). However, there is no difference in the level of satiety between the modified meatballs and meatball control. This is believed to be due to insufficient fiber content to give effect to hunger and satiety.

Keywords: meatballs, satiety study, banana blossom, dietary fiber, modified cassava flour

Introduction

According to WHO in 2016, 39% of adults over 18 years in the world are overweight (BMI ≥25 kg/m²), while obese (BMI ≥ 30 kg/m²) contribute 13% in the population (¹). Nearly 2 billion adults are overweight and over half a billion are obese (¹). Numbers of studies have reported that every weight gain, there is an increased risk for coronary heart disease, type 2 diabetes, cancer, hypertension, stroke, sleep disorders, respiratory disorders, osteoarthritis, and reproductive disorders (irregular periods and infertility).

Several factors affect obesity. Variety, balanced and nutritional dietary pattern that have traditionally been made from fresh, high fiber and herbal spices have shifted to a fast-food consumption which high-fat, high-salt and sugar and low dietary fiber (¹). The high availability of fast food and high energy density leads to high consumption of unhealthy foods (²). Therefore, to lose weight, it is necessary to reduce the consumption of calories. Many strategies to lower calorie intake, such as limiting the portion of the meal. however, this approach tends to trigger hunger and dissatisfaction (³). Another alternative solution is to encourage the consumption of foods that are low in calories per gram or foods that are low in energy density.
Increased intake of dietary fiber is very important to prevent obesity. There are different mechanisms to how dietary fiber can help to lose weight. Foods that contain dietary fiber may decrease calories. According to research that dietary fiber intake is associated with the prevention of weight gain because it can increase satiety or taste (5). Adequate fiber intake can decrease appetite to 5%, decrease long-term energy intake by 2.6% and lose weight to 1.3% (Wanders, 2005). If individuals consume foods that provide more satiety per calorie, then the overall intake of calories will be smaller without sacrificing a feeling of fullness and satisfaction (2). This can hinder excessive energy intake and can help in weight loss.

Indonesia is a country rich in its abundant resources such as bananas and cassava. In 2016 banana production increased by 59.36% compared to the previous year. Bananas can be exploited widely. The heart of bananas is part of a banana that can be processed into nutrient-rich foods. Every 100 grams of banana heart contains 5.7 fibers (5). The heart of bananas also contains saponins that serve to lower bad cholesterol and increase body resistance against the growth of cancer cells. Besides bananas, the availability of cassava in Indonesia is quite abundant up to 19.9 million tons in 2009. Cassava can be processed into Modified Cassava Flour (mocaf) rich in fiber (6). Unfortunately, the consumption of banana and mocaf in the community is very less. Lack of heart consumption of bananas due to the processing and presentation of banana heart is not practical. Developing ready-to-eat products from the heart of bananas will greatly benefit the community to increase consumption of dietary fiber (7). Banana and mocaf’s heart is a potential resource that can produce new foods rich in food fiber and high economic value.

The substitution of banana heart and mocaf meal on the common food consumed by the community has the potential to improve nutrition especially fiber content. Meatballs is one of the fast food favorites of all circles. Meatballs are usually sold directly ready to eat or packed in frozen food products. This study will examine the effect of banana heart substitution and mocaf flour on the receiving power, and the level of glut of fiber-rich meatballs as one of the efforts in increasing fiber intake is useful to prevent obesity.

Mocaf flour can be used for the manufacture of meatballs because it has good adhesive power (8). The average fiber content of mocaf flour by 2.75% can increase the fiber content in food products. But the protein content of mocaf flour is lower than wheat flour. Thus, the addition of mocaf flour cannot reach 100%. Meatball is a popular food product in every circle, one of them students. Its ready-to-eat and delicious flavors become one of the preferred food alternatives for students. According to research conducted. Based on research of meatball consumer characteristic in Gorontalo, that consumer of average age meatball productive (19-25) with student status. Therefore, student can be the right respondent for acceptance test and also level glut in the banana heart meatballs.

The heart of bananas has a considerable nutritional value. The heart of bananas is rich in vitamins, flavonoids and proteins. According to research conducted by Sheng et al (2010) banana heart contains energy of 51 kcal, 1.6 g protein, 0.6 g fat, total carbohydrate including 9.9 g, 5.7 g food fiber, ash /Ash 1.2 g, calcium 56.0 mg, phosphorus 73,3mg, Iron 56.4mg, 13.0mg copper, Potassium 553.3mg, 48.7mg Magnesium, Vitamin E (mg / kg) 1.07mg. High fiber content in the heart of bananas can be consumed as a supplement to increase the intake of dietary fiber. The content of vitamin E in the heart of bananas protect fatty acids by counteracting free radicals. The heart of bananas also contains antioxidants that can reduce the risk of chronic diseases such as cardiovascular disease. According to Wickramarachchi and Ranamukhaarachchi SL (2005) the banana heart contains Quercetin, a type of flavonoids that can prevent oxidation of Low Density Lipoproteins (LDL) from free radicals. The heart of bananas also contains good quality proteins because they contain essential amino acids. The heart of bananas also contains saponins that can lower LDL or bad cholesterol, increase immunity to infections and inhibit cancer cells.

Many studies use the heart of bananas as a supplement to increase the fiber content of certain food products. Research conducted by Elaveniya and Jayamuthunagai (2014), the heart of bananas is added to the manufacture of biscuits. The addition of banana hearts increases the content of dietary fiber by 20% more than control biscuits (7). In the manufacture of abon with the addition of banana heart contains food fiber of 17,81%. The addition of fiber to the food product may affect the palatability of the food product (7). The addition of banana heart to beef meatball with soybean meal substitution has an effect on to organoleptic test on meatball that is on color, taste,
elasticity and acceptability parameter, but it does not affect the texture of meatballs.

**Material and Method**

This research consists of two stages. The first stage is the development of meatball substitution formula of banana heart and mocaf flour. This one-phase study is a purely experimental study. The second stage is a test of acceptance and test of glutness level. For power test receipt is a quasi experimental research using organoleptic test. Test the level of glut of the meatballs used method cross-over trial.

Factorial experimental design with Randomized Complete Randomized Design (RAL) design. With the first factor (J) is the formulation of chicken and banana heart with 3 treatments.

The sample of this research is chicken meatball which substituted banana heart and mocaf flour with different composition. Things to consider in the presentation of the sample are the dosage, temperature, presentation suggestion, favorite test questionnaire. In the test Satiety, according to Karalus (2012), the study sample can be drawn from sub-populations that meet the following inclusion criteria: age 17-24 years, healthy BMI (18.5-27 kg / m2), and accustomed to breakfast. The number of panelists in advanced research is usually more than 25 people. For this study 25 panelists selected from students of Faculty of Public Health Airlangga University who have been selected through screening and willing to sign informed consent. Panelists in advanced research are the same subjects on the test of glutness level.

Samples were obtained from the population entering inclusion criteria. In the first week of treatment, participants willing to approve informed consent will be randomized by simple random sampling to get participants who received control meatballs and participants who received meatball treatment. In the second week of treatment, the sample was crossed. Participants who previously received a meatball control given the meatballs modifications and vice versa.

**Findings**

Subjects in this study were women ages 19-23, students of Airlangga University, and had normal nutritional status. Nutritional status affects the subject’s sensitivity to changes in satiety. People with severe obesity (morbid obesity) who have very high levels of fat will experience leptin resistance, a condition in which the hormone leptin produced very high but does not affect the decrease in appetite (9). In some studies it also mentions gender affecting satiety (10). However, in a study cross-over trial, subjects became their own control, so differences in subject characteristics did not significantly affect the results of the study.

Based on table 1 can be seen that there is no difference between meatball F0 and meatballs F3 on the value of hunger and satiety. This is not in accordance with reviews in previous studies which show that dietary fiber intake is positively associated with satiety. Mathern et. al (2007) studied the effects of 0.4 and 8 g of fiber on foods fenugreek on appetite sensation. The study showed that 8 g of fenugreek had a higher satiety compared to foods containing only 0.4 grams of dietary fiber. Likewise Gustaffon et. al (2008) showed that a portion of carrots containing 6 grams of dietary fiber could significantly satisfy a portion of carrots containing only 3 g of dietary fiber when fed into mixed foods. It is difficult to explain why this study is incompatible with both studies. However, there are various possibilities that may affect the test of glut. The first factor is that small doses of fiber have no significant effect on hunger. According to various studies conducted when dietary fiber less than 6.5 has a small effect on glut when measured by subjective measurements such as Visual Analog Scale (2). For example, Mattes et.al (2007) found no significant difference in glut when subjects consumed a snack bar containing 4 g fiber with a snack bar containing 1 g fiber. Similarly, in studies comparing fiber-rich milk containing 3 g of dietary fiber to non-fiber foods, it showed that there was no significant difference in satiety or taste (11). Therefore, a higher fiber dose is needed to influence satiety.

According to the study that the addition of a dose of dietary fiber will also lead to a decrease in calories or energy density accompanied by increased satiety (12). According to table 2 along with the addition of banana hearts containing dietary fiber, the lower the number of calories it contains. However, the decrease in the number of calories also has no effect on satiety. In addition the amount of fat content tends to be the same between meatball control and meatballs modifications. So the effect on satiety tends to not exist.
Another factor is the presence of macro nutrients that affect the satiety of the protein. Based on research, foods that are high in protein can also affect the level of glut or satiety. Food can have an optimum effect on appetite control when foods are high in protein, dietary fiber and low in fat(2). F0 meatballs consist of 100% chicken meat and beef rich in protein without blending the banana heart. This causes the meatballs F0 to have a higher protein content (15.2 g) than F3 (12 g), although the fiber content of F7 meatballs (ordinary meatballs) is 0 g. As a study conducted to determine the effect of high protein breakfast on obese women, showed that breakfast with 25% protein content can increase glut and there is a significant difference between breakfast with regular protein with a high protein breakfast. Therefore, protein content should also be considered in the measurement of glut.

Conclusion

There was no significant difference in hunger and satiety between controlling meatballs and banana heart meatballs. Although the content of dietary fiber can decrease the number of calories per gram, but the amount of dietary fiber is less significant to give satiety effect.

This study has the limitations of fasting blood glucose test is not performed on the respondents. In addition, this study also did not measure the amount of food intake as a result of the satiety of previous foods because it is difficult to hold the subject to be in the laboratory within 5 hours more to measure the intake of subsequent meals.

Conflict of Interest: Authors have no any conflict interest with other researcher nor institutions

Source of Funding: This research is self-funded

Ethical Clearance: This study is approved by The Health Research Ethics Committee at Faculty of Public Health Universitas Airlangga (reference number: 295-KEPK)

Table 1: Panelist acceptance analysis result towards modified meatballs using Friedman test

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Meatball</th>
<th>Asymp Sig</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>F0, F1, F3, F5</td>
<td>0,005</td>
<td>Difference</td>
</tr>
<tr>
<td>Smell</td>
<td>F0, F1, F3, F5</td>
<td>0,053</td>
<td>No difference</td>
</tr>
<tr>
<td>Texture</td>
<td>F0, F1, F3, F5</td>
<td>0,000</td>
<td>Difference</td>
</tr>
<tr>
<td>Taste</td>
<td>F0, F1, F3, F5</td>
<td>0,137</td>
<td>No difference</td>
</tr>
</tbody>
</table>

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Hedonics Methodology. 2011;


The Influence of Lead (Pb), Zinc (Zn), Ratio Lead (Pb) to Zinc (Zn) in Attention Deficit Hyperactivity Disorder (ADHD)

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Abstract

Background: Attention Deficit Hyperactivity Disorder (ADHD) is a common childhood psychiatric disorder often encountered in clinical practice with major symptoms of inattention, hyperactivity, and impulsivity. Pollution of lead (Pb) is thought to be a cause of ADHD that affects the cognitive deficit of the brain. Zinc supplementation (Zn) can improve the symptoms of ADHD by increasing dopamine transporters binding. The aims of this study is to compare the level of Pb and Pb to Zn ratio on the subject of ADHD and normal children.

Method: This is an observational analytic study with case control design on 44 respondents. Statistical analysis using non-parametric test Man Witney.

Result: There is no significant difference of Pb level in children with ADHD and normal children with p = 0.431 and there is a significant difference of Zn level in ADHD and normal children with p = 0.011 and significant difference in Pb to Zn ratio with p = 0.015.

Keyword: Lead (Pb), Zinc (Zn), Ratio Pb to Zinc (Zn), ADHD

Background

Exposure to lead (Pb) in the environment has a neurotoxic effect resulting in behavioral disorders and cognitive deficits(1). For decades there has been considerable effort to reduce lead levels in the environment(2). Lead may adversely affect cognitive disorders, decreased IQ scores, learning disabilities in mathematics, reading and verbal memory(3).

Metaanalysis study by Goodlad et al concluded that the diagnosis of ADHD is increasing, thus attracting researchers to analyze the factors of heavy metals as factors causing ADHD(4). Lead is the most responsible for mental disorders and thus requires clinical attention(5). In humans, small amounts of metal can adversely affect health and psychological disorders such as ADHD(6). Pb adversely affects the child in the form of mental retardation disorder and impulsivity(7–9). Pb exposure is more common in hair than blood. Pb levels in hair tend to be more sedentary and reflect Pb levels in the subjects compared with temporary blood(10–15). While the trace elements Zinc (Zn), is an essential nutrient in animals and humans(16,17). In ADHD children it is suspected that there is a decrease in Zinc levels that cause concentration and attention disorder(11,18). The impact of high lead levels and low levels of Zinc can lead to impaired cognitive function and learning disabilities in children(19). Measurement of Pb and Zinc levels in hair and Zinc to Pb ratio is expected to help reduce the risk of ADHD severity(21). Zinc plays an important role in the metabolism of neurotransmitters and prostaglandins, by maintaining the function and structure of the brain. Dopamine plays an important role in the pathophysiology of ADHD and the melatonin hormone plays an important role in the regulation of...
dopamine, as of the administration of Zinc is expected to improve ADHD symptoms. Zinc levels of children with ADHD are thought to be lower than normal children. With the administration of Zinc supplementation, it will be able to correct the existing disorder \(^{(17,20,21)}\).

**Method**

This is a a case control study in grade 1 to grade 6 students of Bina Karya Elementary School Surabaya. With the use of random sampling formula, we get the number of samples of 23 ADHD subjects and 21 non ADHD subjects who meet the inclusion criteria. The inclusion criteria of the study were ADHD patients aged 6-12 years old, mothers of ADHD patients with minimum junior high school education, able to communicate using Indonesian, cooperative, and did not experience severe psychosocial stressors.

Examination of lead and zinc levels were used hair samples by Atomic Absorption Spectrophotometry (AAS) method. Abbreviated Conners Teacher Rating Scale is used to assess ADHD scores. This scale was developed by C. Keith Conners, Ph.D. While the validity and reliability in the Indonesian has been done by Sasanti Juniar in 1999.

To assess the psychosocial stressors, it used Social Readjustment Rating Scale by Holmes and Rahe (1967).

**Results**

**Table 1 Mother and respondent demographic data**

<table>
<thead>
<tr>
<th>ADHD Category</th>
<th>Normal</th>
<th>ADHD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girl</td>
<td>6</td>
<td>28.57%</td>
</tr>
<tr>
<td>Boy</td>
<td>15</td>
<td>71.43%</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not occupied</td>
<td>16</td>
<td>76.19%</td>
</tr>
<tr>
<td>Occupied</td>
<td>5</td>
<td>23.81%</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1.000.000 / month</td>
<td>11</td>
<td>52.38%</td>
</tr>
<tr>
<td>1.000.000-3.000.000 / month</td>
<td>6</td>
<td>28.57%</td>
</tr>
<tr>
<td>&gt;3.000.000 / month</td>
<td>4</td>
<td>19.05%</td>
</tr>
<tr>
<td><strong>Husband and wife relationship</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Good</td>
<td>21</td>
<td>100.00%</td>
</tr>
<tr>
<td><strong>Relationship among family member</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Good</td>
<td>21</td>
<td>100.00%</td>
</tr>
<tr>
<td><strong>Maternal age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-31 y.o</td>
<td>1</td>
<td>4.76%</td>
</tr>
<tr>
<td>32-38 y.o</td>
<td>9</td>
<td>42.86%</td>
</tr>
<tr>
<td>39-45 y.o</td>
<td>8</td>
<td>38.10%</td>
</tr>
<tr>
<td>46-52 y.o</td>
<td>2</td>
<td>9.52%</td>
</tr>
<tr>
<td>53-59 y.o</td>
<td>1</td>
<td>4.76%</td>
</tr>
<tr>
<td><strong>Children age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤12 tahun</td>
<td>19</td>
<td>90.48%</td>
</tr>
<tr>
<td>&gt; 12 tahun</td>
<td>2</td>
<td>9.52%</td>
</tr>
</tbody>
</table>
The results in table 1 show 44 respondents consisting of 23 respondents ADHD and 21 respondents non ADHD. From the age of children found the most age is less than 12 years with a percentage of 46.3% in non-ADHD respondents and 53.7% of ADHD respondents. The order of the most children is the first child of 56.52%. The highest maternal education in ADHD and non ADHD respondents was others each was 11 (50%). Maternal age in respondents ADHD mostly in the range 39-45 years of 11 people (57.9%), while the mother of respondents non ADHD as many as 9 people (64.3%). Most mothers of ADHD and non-ADHD children do not work and with the most income is less than Rp 1000,000 per month. Husband and wife relationship is poor on the mother of ADHD respondents of 3 people (100%) and the relationship between family members is poor as many as 5 people.

Table 2. Statistical Analysis Results of Pb level, Zn level, and Pb to Zn ratio

<table>
<thead>
<tr>
<th></th>
<th>Median (Minimum – maximum)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb on ADHD (n = 23)</td>
<td>10.74 (4.76-18.05)</td>
<td>0.431</td>
</tr>
<tr>
<td>Pb on non ADHD (n=21)</td>
<td>11.39 (4.78-24.08)</td>
<td></td>
</tr>
<tr>
<td>Zn on ADHD (n = 23)</td>
<td>307.84 (82.75-511.96)</td>
<td>0.011</td>
</tr>
<tr>
<td>Zn on non ADHD (n=21)</td>
<td>177.55 (17.56-448.39)</td>
<td></td>
</tr>
<tr>
<td>Pb/Zn on ADHD (n = 23)</td>
<td>0.03 (0.02-0.15)</td>
<td>0.015</td>
</tr>
<tr>
<td>Pb/Zn on non ADHD (n=21)</td>
<td>0.06 (0.02-0.22)</td>
<td></td>
</tr>
</tbody>
</table>

significant p< 0.05

Discussion

From the demographic data of the respondents, the result of the sample of ADHD, boys patients were 16 children and girls were 7 children. This result is consistent with previous findings that the prevalence of ADHD is greater in males in comparison between 3-4 boys versus 1 girl(22–24). From the demographic characteristics of mothers that consist of age, education, occupation, and income, it is found that the age of mothers in ADHD children is majority older than mothers of non-ADHD children. This result is inconsistent with previous studies which concluded that the maternal age of ADHD children was younger than that of non-ADHD children(25). This result can be obtained because the parents’ knowledge of the problems is still low so they do not understand how to handle their children disorder.

The results of the research was the majority of mothers are other education, namely elementary and junior high school, this result obtained based on interviews that many mothers was married at a young age and can not continue to higher education because there is no cost and some others mothers experience pregnancy.

From the data about the occupation of the mother found that most mothers was unoccupied. In parent interviews it is found that most mothers should take care of their children at home because many father work outside as a driver, private employee and work as a handyman. This result is also in accordance with previous research that the mother of many ADHD children who have lost their job or can not work because they have to take care of their own ADHD child(25).

The results of maternal earnings working on mothers of ADHD and non-ADHD children were the largest in less than a million rupiah but the majority stated the results were sufficient. This result is because most of the respondents are Javanese who put togetherness, gotong royong and nrimo culture and emphasize the existence of life as flowing water surrender to God and shame to express the shortcomings(26,27).

Statistical analysis used Mann Whitney non parametric comparative test. The data were not normally distributed and there was no significant difference between Pb levels in ADHD and non ADHD children. This result is consistent with the theory that causes of ADHD this day is unclear. High levels of Pb may cause cognitive, emotional and behavioral disorders but Pb is not the determining factor that causes ADHD. This theory also corresponds to results in the field showing high Pb levels in non-ADHD subjects(28). The results showed that Pb levels in ADHD respondents were lower than those for non-ADHD respondents but this condition still requires clinical attention because Pb is toxic and a global health problem in the environment and may
interfere with biochemical processes in the brain. Lead exposure still requires more research because it is an important issue in the global health of the world, especially in developing countries.

There was a significant difference in Zinc levels in ADHD children and non ADHD. From the above results it can be considered to administer zinc on ADHD subjects. This result is consistent with the literature which states that in ADHD subjects there is deficiency or excess of Zn level. Zinc plays an important role in protein and DNA synthesis, wound healing, bone structure and improvement of the immune system. Zinc deficiency may involve impaired growth, loss of hair, diarrhea, immune system decline and dermatitis. Zinc deficiency also causes late growth process, late puberty, erectile dysfunction and hypogonadism in men. It is said that 5% of the world’s population suffers from zinc deficiency. Zinc is a trace element because the concentration in plasma is only about 12-16 μM, in the body there are 2-4 grams of zinc with a majority in skeletal bone and muscle. The body does not store zinc and zinc intake is obtained from food. The recommended dosage for girls and boys ages 4 to 8 months is 5mg, 14 to 18 years of age in women by 9 mg and men by 11 mg. The concentration of zinc persists constantly in hair, skin, heart, muscle, as in plasma, liver, bone and testes. Chronic zinc deficiency is more sedentary in hair than in plasma. Zinc is an essential micronutrient of physiological metabolism. Zinc plays an important role in catalyzing enzyme activity, contributing to protein structure and gene expression regulation. Other studies suggest excess zinc levels may also cause ADHD.

There was a significant difference between the ratio of Pb to Zn in ADHD and non ADHD children. From the examination there are differences in the ratio of Pb and Zn where the high Pb level come with lower Zn level. Chronic lead exposure adversely affects physical growth, development of the nervous system, memory impairment, learning disorders, cognitive deficits, psychological and behavioral disorders. Infants and children are at high risk of lead pollution, with levels below 10 μg/100 ml may cause growth disturbance. Much effort has been made to reduce lead exposure in infants and children. The chelation program is used as the ultimate management but the therapeutic process is risky, with 50% suffering the side effects of losing the minerals needs. The chelation is also not useful in improving cognitive, behavioral and neurocognitive disorders. Therapy on lead can increase the cytotoxicity and astrocite activity. Lead exposure causes astrocite damage. Lead can increase lysosomal density and nucleus inclusions, increase the area of reticulum of endoplasma, increase lactic dehydrogenase (LDH) damage, and decrease the levels of the sulfydryl group that can be overcome by antioxidant administration. The lead deposit in astrocite leads to the accumulation of protein in the endoplasmic reticulum, increased protein response, and breakage of cell cycles.

**Conclusion**

There was a significant difference between Zinc levels in ADHD and non ADHD subjects and Pb/Zn ratios in ADHD and non ADHD subjects.

**Ethical Clearance:** Taken from Health Research Ethics Committee Faculty of Public Health Airlangga University No. 657KEPK

**Source of Funding:** Self

**Conflict of Interest:** Nil

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A Study About Incidence of Dapsone Syndrome in Patients on Multidrug Therapy for Hansens Disease

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Abstract

Dapsone is a parent sulfone drug. It was synthesized by Fromm and Whitmann in 1908. Robert Cochrane introduced dapsone for the treatment of Hansen’s disease in India. Dapsone is used for variety of dermatological conditions other than Hansen’s disease. Dapsone syndrome is a hypersensitivity reaction first described by Lowe and Smith in 1949. The name dapsone syndrome was given by Allday and Barnes in 1951. Dapsone along with anticonvulsants, allopurinol, sulfonamides, minocycline and NSAIDs are commonly associated drugs for drug induced hypersensitivity. Dapsone syndrome has also been reported in psoriasis, lichen planus, acne vulgaris and erythema elevatum diutinum and dermatitis herpetiformis.

Keywords: allopurinol, sulfonamides, minocycline

Introduction

Dapsone which is chemically 4, 4-Diamo diphenyl sulphone is a sulfone drug used for variety of dermatological conditions like Hansen’s disease, blistering disorders, infections like leishmaniasis, mycetoma etc, Neutrophilic vasculitis, collagen vascular disorders, erythema elevatum diutinum, follicular mucinosis, acne vulgaris etc. Dapsone is completely absorbed and peak concentration attained within 2 to 4 hours. Plasma half life for dapsone is 28 hours. The standard dose is 100mg per day for adults and in children 0.9-1.4 mg/kg.

It is retained in the skin, liver, kidney and mucosa. It acts by inhibiting dihydro folate reductase which is involved in the conversion of PABA (para amino benzoic acid) involved in folic acid synthesis. It is used in other dermatological conditions is based on scavenger like function, inhibition of alpha-1 protease, neutrophilic chemotaxis, eosinophilic chemotaxis, prostaglandin D2, prostaglandin E2, myeloperoxidase hydrogen peroxide halide system and it interferes with humoral and cell mediated immunity.

Methodology

A cross sectional study was done with 50 patients diagnosed with Hansen’s disease and on multidrug therapy attending the Department of Skin and Sexually Transmitted diseases. All the patients were subjected to Complete history

Complete physical examination

Dapsone syndrome also known as five week dermatitis or sulfone syndrome is an idiosyncratic hypersensitivity systemic syndrome which may end fatally if not identified and treated early. Dapsone syndrome usually occurs 4 to 6 weeks after starting therapy.

DISCUSSION

It is thought to be a hypersensitivity reaction because of interval between starting the therapy and presentation of clinical symptoms. It was also thought that metabolic differences in production and detoxification of reactive oxygen species are responsible for hypersensitivity. Dapsone is metabolized by oxidation – N- hydroxylation and N-acetylation.

Toxic intermediate metabolites (nitrosamines) and compounds of N-hydroxylation pathway are responsible for methhemoglobinemia, hemolytic anemia and
Dapsone syndrome. Dapsone syndrome is influenced by genetic and environmental factors. It manifests as exfoliative dermatitis, skin rashes with pruritis, fever, hepatitis, hepatosplenomegaly, lymphadenopathy, acute renal failure, myocarditis and cholangitis.

Basic Needs & Importance:

Pulmonary and pancreatic involvement also been reported. Cutaneous lesions can be maculopapular rash or vesiculo pustular reaction like SJS and TEN. Other manifestations are conjunctivitis, arthritis and white tonsillar membrane. Onycholysis can also be seen. Mortality rate is 13-15%. Commonest cause of death is due to liver failure, shock, sepsis, bone marrow failure and pulmonary insufficiency.

Extract From Some Studies:

Differential diagnosis includes infectious mononucleosis, viral exanthema, hepatitis B infection, rifampicin hypersensitivity and lepra reaction. Treatment is by immediate stopping of the drug and oral steroids, antipyretics, antibiotics, topical emollients and other supportive measures. For Hansen's patients, dapsone is stopped and other two drug clofazimine and rifampicin are continued.

Conclusion & Recommendations

Out of 50 patients studied, 1 patient showed features of Dapsone syndrome (hepatitis, hepatosplenomegaly, maculopapular rash, peripheral neuropathy, fever and arthritis).

Dapsone syndrome is a fatal idiosyncratic hypersensitivity systemic syndrome. Early onset and partial forms is found to be more common than previously reported. Hence awareness about this condition, early diagnosis and proper management are needed to prevent mortality.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

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A Study of Skin Tumors Over the Face

Padam Kumar M1, Jayakar Thomas2
1Junior Resident, 2Professor, Department of Dermatology, Sree Balaji Medical College & Research Institute

Abstract

Skin tumors over face are common clinical presentation. Most commonly noticed are trichoepithelioma, syringoma, angiofibroma and xanthelasma. Their incidence been in doubt. We hereby report a summary of 20 patients who presented with a tumor over face. Tumors of the skin range from small papules to large fungating masses. They are infrequent in people with brown skin and occupy a small space in medical and public perceptions of the role of a dermatologist

Keywords: trichoepithelioma, syringoma, tumor

Introduction

Some tumors are commonly seen, others are extremely rare and still others mimic non-neoplastic disorders. They also form an important component of some genodermatoses. Certain tumors are easily recognized clinically, based on the characteristic site of presentation, size, color, distribution, and symptoms, while others can only be diagnosed by histopathology, immunohistochemistry, or other diagnostic techniques. About a third of sweat gland tumors contain TP53 gene mutations1. They arise de novo while some arise from normal appendageal structures. They present as smooth papules or nodules that grow slowly to a small size. Multiple lesions are a reliable clinical clue to the benign nature of the condition. The most common cutaneous tumors seen over the face are trichoepithelioma, syringoma, angiofibroma and xanthelasma.

Methodology:

Twenty patients with skin tumors over the face were included in our study. A detailed history was elicited including details regarding duration, history of evolution, progression and treatment modalities if any. Complete physical and dermatological examination were done in all patients2. Skin biopsy performed in all patients to confirm the diagnosis.

Table 1: Commonly observed skin tumors on face.

<table>
<thead>
<tr>
<th>CUTANEOUS TUMORS OVER THE FACE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichoepithelioma</td>
<td>8(40%)</td>
</tr>
<tr>
<td>Syringoma</td>
<td>6(30%)</td>
</tr>
<tr>
<td>Xanthelasma</td>
<td>6(30%)</td>
</tr>
</tbody>
</table>

Discussion

Some tumors may consist completely or partly of undifferentiated cells that cannot be recognized as resembling a normal appendage3. The commonly observed tumor in our study were trichoepithelioma, syringoma and xanthelasma. Syringomas are fairly common tumors that occur more frequently in women. The classical presentation is of multiple, skin-colored, dome-shaped, and flat papules some of which have characteristic angulated borders. The papules are 1-3 mm in size and occur around the eyes.

Extract From Some Studies:

Trichoepithelioma, hamartoma of the hair germ made out of youthful islands of basaloïd cells with central, crude follicular separation and indenation of a cell stroma. It presents with a smooth knob, more often than not on the face. Most basic age gatherings are youthful grown-ups. Numerous sores, which are acquired via autosomal prevailing transmission are viewed as

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various, little silvery injuries on the centrofacial skin.

Xanthomatosis is a cutaneous appearance of lipidosis wherein plasma lipoproteins and free unsaturated fats are subjectively adjusted, bringing about a morphologic change as lipids amass in froth cells in the tissues.

**Basic Needs & Importance:**

The upper eyelid and the region around the inner canthus are the most common sites of involvement, although in severe hypercholesterolemic conditions (e.g. familial hypercholesterolemia) they may occur circumferentially or on the outer aspects of the eye varying from 2 to 30 mm in length. Frequent symmetry with the tendencies to permanency, multiplicity, and coalescence are characteristic.

**Conclusion & Recommendations**

A total of 20 patients (9 males and 11 females) were included in the study. Most common age group was in the range of 41-50 (34%) followed by 51-60 years (51%). Skin tumors commonly observed were trichoepithelioma 8(40%), syringoma 6(30%) and xanthelasma 6(30%) In this study, among the skin tumors we found trichoepithelioma as the commonest tumors accounting for 40%. Treatment includes electrocautery, surgical excision, curettage, cryotherapy and dermabrasion. High energy pulsed carbon dioxide laser can also be used for treatment.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**


Significance of Pase Score in Psoriasis: A Cross-Sectional Study in a Tertiary Care Hospital

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Abstract

To look at the PASE (Psoriatic Arthritis Screening and Evaluation score) with the PASI (Psoriatic region seriousness record) score, NAPSI (Nail psoriasis seriousness list) score, CASPER (Classification Criteria for Psoriatic Arthritis) criteria, term of ailment and span of medicines.

Associate the PASE score with the clinical examination discoveries. Psoriatic joint inflammation is an interminable foundational incendiary condition described joint inflammation related with psoriasis of the skin and nails with negative rheumatoid factor and nonappearance of rheumatoid knobs. Gauge of the commonness ranges at 0.3 to 1% of the all inclusive community and at 25% in patients with cutaneous psoriasis.

Keyword: rheumatoid, Psoriatic Arthritis

Introduction

Psoriatic joint pain is a ceaseless fundamental fiery condition portrayed joint pain related with psoriasis of the skin and nails with negative rheumatoid factor and nonattendance of rheumatoid knobs.

Gauge of the pervasiveness ranges at 0.3 to 1% of the all inclusive community and at 25% in patients with cutaneous psoriasis. Early finding will help avert unhelpful examinations and treatments and help in treating the patient in beginning periods of the malady. Already early finding was not of significance because of the nonattendance of medications which had the option to change the course of sickness¹.

Methodology

A cross sectional study including 100 patients clinically diagnosed as psoriasis & age above 18 will be taken for the study after taking a written informed consent.

PASE score according to the questionnaire will be calculated along with PASI, NAPSI, CASPER scores.

PASE score will be compared with the other scores as well as the clinical examination findings of the patient as well as the treatment medication and duration.

Discussion

Psoriatic Arthritis Screening & Evaluation (PASE):

The scale ranges from ‘Unequivocally Agree’ to ‘Strongly Disagree’. PASE absolute score is determined by summing the scores for every one of the 15 things¹. The all out score ranges from at least 15 to a limit of 75³. PASE has two sub-scale scores, indications and capacity. The side effect sub-scale has 7 things, and the greatest indication score is 35. The capacity sub-scale has 8 things, and the most extreme capacity score is 40. Cut off score for PsA is 40.

Extract From Some Studies:

Up to 30% of patients with psoriasis experience the ill effects of simultaneous psoriatic joint pain, and both the sicknesses have more terrible personal satisfaction results contrasted with the all inclusive community.
There is restricted writing looking at personal satisfaction results between these sicknesses. We look to think about personal satisfaction results between both these gatherings.

Conclusion & Recommendations

Regardless of forceful treatment, physical personal satisfaction was more regrettable in psoriatic joint pain patients contrasted with psoriasis patients. The psychological personal satisfaction records were equivalent in both the gatherings were still underneath the populace standard. These outcomes propose requirement for screening for psoriatic joint pain in patients with psoriasis to lessen the weight of physical personal satisfaction and screening for early indications of mental sicknesses in both these malady populaces.

Ethical Clearance - No ethical clearance was necessary for this research work

Source of Funding - Self funded project

Conflict of Interest - Nil

References


Comorbid Conditions Associated with Atopic Dermatitis

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Abstract

To study the various comorbid conditions associated with Atopic dermatitis. Atopic dermatitis (AD) is now becoming very common and is being diagnosed in a vast majority of children.

AD is known to be associated with several comorbidities. The connection seems to be due to more than one reason – genomes, skin barrier dysfunction, and inflammation.

Keywords: Atopic Dermatitis , Disorder, AD

Introduction

There are conflicting results about the association between AD and diabetes. Multiple large-scale epidemiological studies demonstrated that obesity is a risk factor for atopic disorders, including asthma and atopy.

Obesity is considered to be a trigger or exacerbating factor for AD, and not merely an epiphenomenon. The associations between AD, obesity, and other metabolic factors in some patients.

Methodology

A cross sectional study was conducted on 30 patients diagnosed with Atopic dermatitis.

Investigations done were

• Complete physical examination
• Blood pressure
• Fasting blood sugar
• Ultrasound abdomen (fatty liver)

There are conflicting results about the association between AD and diabetes. Multiple large-scale epidemiological studies demonstrated that obesity is a risk factor for atopic disorders, including asthma and atopy.

Fillagrin and other genetic mutations involved in AD result in both an AD phenotype and increased risk for obesity and its sequel. Obesity is considered to be a trigger or exacerbating factor for AD, and not merely an epiphenomenon¹.

Discussion

The associations between AD, obesity, and other metabolic factors have important clinical ramifications. These associations highlight the importance of maintaining ideal BMI suggest that weight loss may actually improve AD in some patients².

Extract From Some Studies:

Adipokines play an important role in allergic inflammation. Adiponectin tend to be lower in obesity. Leptin is an adipokines that is unregulated in obesity³. It has been shown to induce eosinophils in vitro and stimulate chemokines. Leptons may play a role in allergic asthma³.

Basic Needs & Importance:

Patients with AD were found to have increased fatty liver. It is possible that the association between fatty liver and AD is secondary to circulating free fatty acids in chronic obesity⁴. 
Conclusion & Recommendations

Out of 30 patients 16 patients had associated comorbidities. 7 patients were obese. 2 patients were diagnosed to have fatty liver on ultrasound abdomen. 4 patients had elevated fasting blood.

Our information uncover a striking relationship between psychological well-being issue and AD in the US pediatric populace. The seriousness of the skin sickness changes the quality of the affiliation.

Imminent accomplice studies are expected to confirm these affiliations and to investigate hidden instruments. Methodologies to avoid AD or to forcefully treat early skin aggravation may change the danger of psychological well-being issue in danger kids.

Ethical Clearance- No ethical clearance was necessary for this research work.

Source of Funding- Self funded project

Conflict of Interest - Nil

References

A Study on Incidence of Knuckle Pebbling in Diabetes

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Abstract

This study attempts to find out the incidence of Knuckle pebbling in diabetes. Knuckle pebbling is a common dermatological finding of Diabetes mellitus. They are called as Huntley’s papules or Finger pebbles.

In this, Knuckles and dorsal fingers show pebbling. They usually come with complain of dryness of hand. Patient may give history of poor glycaemic control. Sand paper like appearance of skin is seen over the knuckles and the interphalangeal joints. It is the cutaneous marker of diabetes.

**Keywords:** diabetes, glucose.

Introduction

Patients with diabetes tend to have thicker skin. There is no positive history of trauma I such cases. Epidermal hyperkeratosis and disorganised collagen in dermis with perivascular infiltration is seen on dermatopathological examination¹.

A cross sectional study was done with 30 Diabetic patients. All the patients were subjected to

Complete history

Complete physical examination

Methodology

Knuckle pebbling is more commonly seen with Diabetes. These are the cutaneous markers of Diabetes. Knuckle pebbles are seen as multiple, grouped, minute papules. They are seen over knuckles, dorsum of the fingers, periungual region³.

These pebbles are seen more commonly with Diabetes than as individual presentation. It can be seen in association with Acanthosis nigricans. Knuckle pebbles are different from knuckle pads.

Extract from some case studies/life scenarios:

Cutaneous examination shows diffuse xerosis and rough skin which gives sand paper like appearance over knuckles arranged in cobblestone pattern. This condition may not be present with pruritus.

<table>
<thead>
<tr>
<th>CUTANEOUS SIGNS IN DM</th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knuckle pebbling</td>
<td>11 (30)</td>
</tr>
<tr>
<td>2. Acanthosis nigricans</td>
<td>9(11)</td>
</tr>
<tr>
<td>3. Periungual skin pebbling</td>
<td>3(11)</td>
</tr>
</tbody>
</table>

Basic Needs & Importance:

Looking into pathogenesis of this in association with Diabetes is not yet clear. Collagen Hydration secondary to polyol accumulation and glycosylation of collagen which is not enzymatic action contributes to pathogenesis of skin thickening in Diabetes².

Dermatopathology examination with H&E staining of biopsy from knuckles shows hyperkeratosis of the epidermis, enlarged papillary dermis; collagen bundles are thickened and vertically oriented along with elastic fibers. Along with this mild perivascular infiltration is seen

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Conclusion & Recommendations

Out of 30 patients studied, 13 patients showed features of knuckle pebbling. Almost all of the Diabetic patients selected for the study showed thickening of the skin.

Knuckle pebbling is seen in almost half of the Diabetic patients. Other than the knuckle pads, few diabetics showed pebbling over fingers and periungual region where few were seen along with Acanthosis Nigricans.

Generally, ulnar side of the skin over fingers is smoother than radial side. On clinical examination if both sides feel the same, then that patient is likely to have Diabetes mellitus4.

There is no specific treatment for knuckle pebbles. There can be improvement with good diabetic management.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References

Significance of Dyslipidemia in Males with Androgenetic Alopecia

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Abstract

To think about the frequency of dyslipidemia in guys with androgenetic alopecia. Androgenetic alopecia normally known as male pattern hairlessness is the most widely recognized reason for balding in men. There is androgen-mediated conversion of susceptible terminal hair follicles to vellus hairs. Many studies have evaluated lipids to be the pathogenic factor for coronary artery disease in Androgenetic alopecia patients. So its detection at an early stage is very important.

Keywords: lipids, androgenetic alopecia

Introduction

This study is designed to substantiate the incidence of dyslipidemia in Indian males with androgenetic alopecia, as screening of Androgenetic alopecia patients for dyslipidemia can lead to early intervention and prevention of patients from developing cardiovascular complications like coronary artery disease in the future¹.

Androgenetic alopecia or male pattern hair loss is the most common cause for baldness in males characterized by progressive loss of hair. It is a common psychosocially and cosmetically distressing condition. The thick, pigmented terminal hairs gradually transform to thin, short, indeterminate hairs and finally to non-pigmented vellus hairs. The dihydrotestosterone is responsible for the shrinkage of the hair follicle that is genetically sensitive to it.

Methodology

A cross-sectional study was conducted in 15 male patients diagnosed with androgenetic alopecia. Androgenetic alopecia was diagnosed based on family history, clinical findings and the pattern of thinning of hair ².

Discussion

The age of these patients was between 18 and 35 years. An informed written consent was obtained from each of these patients. These patients were subjected to full history taking, thorough general and dermatological examination. Those patients with systemic disorders, other alopecia’s and on any medication that could affect the lipid metabolism, smoking and alcohol intake, cancer were excluded from the study ⁵.

The patients were subjected to a 12 hour fasting period after which a venous blood sample was taken for lipid profile which includes

- Total cholesterol (CHO),
- High density lipoprotein (HDL-C),
- Low density lipoprotein (LDL-C),
- Triglyceride (TGL),
- Very low density lipoprotein (VLDL),
- Total cholesterol and HDL-C ratio

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Extract From Some Studies:

The basic type represent the shape of the anterior hair line (L,M,C,U) the specific types represent the density of hair on specific areas like the vertex and frontal areas (V & F) and the final is based on the combination of the two types. Androgens are found to decrease the HDL-C.

Conclusion & Recommendations:

Out of the 15 patients evaluated 8 patients showed abnormal lipid profile.

We suggest that all males with Androgenetic alopecia must be evaluated for fasting lipid profile as abnormal lipid profiles are considered as early indicator for cardiovascular risk. Early intervention can prevent patients from developing coronary artery disease.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References

Radial Cutaneous Nerval Biopsy in the Detection of Leprosy in Patients

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1Junior Resident, 2Professor, Department of Dermatology, Sree Balaji Medical College and Hospital, Chennai.

Abstract

To examine the job of spiral cutaneous nerval biopsy in the early conclusion of sickness and to separate unadulterated neural infection from different neuropathies. Sickness is an incessant irresistible granulomatous infection brought about by Mycobacterium leprae that basically influence shallow tissues, particularly the skin and fringe nerves.

Mycobacterial disease causes a wide exhibit of cell safe reactions. These immunologic occasions at that point evoke the second piece of the sickness, a fringe neuropathy with possibly long haul results. Infection is an especially regular reason for neuropathy in creating nations.

Keywords: leprosy, nerves, biopsy

Introduction

In all patients with sickness, the nerve tissue is perpetually included. The dermal nerves are tainted in all the skin injuries, including uncertain disease of adolescence. Nerve trunks are extended unmistakably in 40-55% of patients and this occasionally originates before tactile misfortune in the relating nerve an area. Clinical examination is frequently lacking to dependably analyze diseased neuropathy1.

Methodology

A cross sectional investigation was done in 30 patients who show highlights of vague Hansen’s (badly characterized hypopigmented patches with negative cut skin smear for AFB and uncertain skin biopsy) and those with thickened fringe nerves will be incorporated into the examination. Educated oral and composed assent is gotten from all members2.

Extract from some case studies/life scenarios:

AFB recoloring by a decent Fite-Faraco strategy and stains for axon and myelin were done. Wherever represented, examinations, for example, a glucose hindrance test, a X-light discharge spine, a collagen workup, electromyography, and nerve conduction studies were done to square other potential purposes behind periphery neuropathy. All of the patients were presented to

• Complete history
• Complete physical examination
• Nerve biopsy

Basic Needs & Importance

A histological finding of unclear was made when the nerve demonstrated lymphocytic interruption; tuberculoid sullying, when an assault of epithelioid cells with or without goliath cells and lymphocytes was seen; fringe uncleanliness, when in spite of the above invade some froth cells were open; and lepromatous issue, when macrophages piled up with AFB and a round cell assault were seen. When the biopsied nerve displayed a mononuclear enter with fibrosis and hyalinization, a conceivable examination of unhealthy neuritis was made3.

The activity of winding cutaneous nerve biopsy in the illness is considered. It is a by and large direct opd
system, a cutaneous nerve biopsy is a huge illustrative mechanical assembly, particularly for basic neuritic uncleanliness⁴.

Conclusion & Recommendations

Out of 30 patients studied, 24 patients showed highlights of uncertain Hansen’s. Macrophages and Schwann cells stacked up with living creatures and trash (foamy cells) appear in the epineurium, endoneurium, and perineurium.

In the perineurium, foamy macrophages enter and separate individual layers, fibroblasts and perineurial cells duplicate, and collagen is deposited⁵. This produces onion-cleaning of the nerve fascicles. Development of connective tissue (peri-and endoneurial fibrosis) isn’t as obvious as in tuberculoid (TT) disease⁶. Mycobacterium leprae living creatures are incredibly different and are as often as possible seen in globoid bundles on Ziehl-Nelson recolored paraffin-introduced models.

They are found in all the nerve compartments and impact a colossal grouping of cells, including perineurial cells, fibroblasts, cells of the macrophage histiocyte heredity, Schwann cells, and endothelial cells⁷.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References

A Study of Nail Changes in Bullous Disorders

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Abstract

To observe nail changes in all patients attending skin OPD in Sree Balaji Medical College. “Face is the mirror of the mind”; likewise nails are a reflection of both internal and external disease.

Functions of nail are to assist in picking up small objects, to protect the distal digit, to improve fine touch sensation and to enhance aesthetic appearance of hands. Nail disorders comprise 10% of all dermatological conditions.

Keywords: bullous, nail disorder.

Introduction

The accurate recognition and description of nail findings is the crucial first step in diagnosing a nail disorder. The worldwide incidence of nail disorders is increasing and it continues to spread and persist.

However, appendageal structures like nail and hair may be as good reflectors as skin for presence of many systemic disorders. Cosmetic appeal of well manicured nails is undeniable; at the same time their efficacy as a diagnostic tool is well known.

Methodology

Twenty patients with bullous disorders were included in our study. All patients were subjected to:

Full history taking complete physical examination was done in all patients.

The nails changes were observed in all patients and interpreted accordingly.

<table>
<thead>
<tr>
<th>NAIL CHANGES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paranoychia</td>
<td>40%</td>
</tr>
<tr>
<td>Onychomadesis</td>
<td>30%</td>
</tr>
<tr>
<td>Nail dystrophy</td>
<td>10%</td>
</tr>
<tr>
<td>No nail changes</td>
<td>20%</td>
</tr>
</tbody>
</table>

Discussion

Nail disorders are seen in various dermatoses like fungal infection, psoriasis, lichen planus, vescicobullous and collagen vascular disorders. In our study, infections were found to be the most common condition affecting nails. Paronychia (both acute and chronic) was found to be the most common among them.

Most of the patients were females and were housewives by occupation. This explains the increased presentation of paronychia patients in our study. It can affect one or multiple digits.

Extract From Some Studies:

Any finger might be included. The underlying change begins with loss of fingernail skin because of overexposure to water, caustics and cleansers and subsequently the nail crease is isolated from the nail where a little pocket is framed. These unusual interstices are hard to keep dry.

It stays soggy for an extensive stretch after wet work and the clammy furrows are subsequently attacked by growths and microorganisms which produce endless...
aggravation and trademark swelling of the nail folds. It is frequently joined by pruritus, agony and nail changes. This constant procedure may have intense flare ups.

Nail dystrophy is certainly not a typical appearance in bullous issue, can either be idiopathic or be related with an assortment of incendiary and different issue like lichen planus, psoriasis, alopecia areata, ichthyosis vulgaris, dermatitis, vitiligo, essential biliary cirrhosis and IgA lack.

Nail changes additionally happen following utilization of specific medications. In our examination we have seen medication actuated melanonychia following utilization of zidovudine and NSAIDs. Different medications like beta blockers, ACE inhibitors, malignant growth chemotherapy, carbemazepine and so forth additionally actuate nail changes.

**Basic Needs & Importance:**

Nail involvement in pemphigus, paronychia and onychomadesis is the most common, as seen in our study. Pitting, cross ridging, discoloration, trachyonychia, onychorrhexis, onycholysis, subungual hyperkeratosis, and complete destruction of nail plate are some of the other nail abnormalities reported in various studies.

Periungual or subungual bullae producing hemorrhagic onycholysis should alert the clinician about the diagnosis of epidermolysis bullosa (EB).

Nail changes are milder in EB simplex, similar to nail dystrophy and onychomadesis. Onychogryphosis of extraordinary toe nails might be an element of EB simplex.

Serious nail changes like onychodystrophy and anonychia are seen in junctional and dystrophic EB (DEB).

Few clinical features are pointers to the diagnosis of junctional EB (JEB). Anonychia during neonatal period may be the presenting symptom. Drumstick appearance of the distal digits covered with granulation tissue is typical of Herlitz JEB. Hemorrhagic paronychia in neonates is also a hallmark sign of this disorder. Pseudosyndactyly (3-5%), hair loss and gross dental defects are seen in non-Herlitz JEB.

Toenails are dystrophic and frequently absent in DEB. Total anonychia is seen in recessive DEB and Mitten deformity of hands and feet is the pointer to the diagnosis of the generalized recessive form of DEB (Hallopeau-Siemens variant).

**Vesiculo-bullous disorder**

Longitudinal leukonychia is a diagnostic sign of HAILEY HAILEY, and may be helpful to differentiate this disorder from immunobullous disorders.

**Conclusion & Recommendations**

In our examination we found that, Bullous issue as often as possible reason nail anomalies, especially paronychia and onychomadesis are the most well-known discoveries. We likewise discovered that, nail association in pemphigus vulgaris is uncommon. In this sickness, nail signs present, by request of recurrence, as perpetual paronychia, onychomadesis, onycholysis, Beau’s lines and trachyonychia. Likewise in pemphigus vulgaris (PV) nail irregularities can even go before skin findings.

Nail injuries frequently backslide just before summed up ailment worsening or repeat. Extreme nail changes are regularly connected with broad and serious sickness. Fingernails are all the more usually influenced. A report in the writing partners hemorrhagic nail anomalies with poor visualization in patients with PV. Nail scarring and pterygium have likewise happened in couple of patients, which is an uncommon entanglement of bullous pemphigoid. Nail misfortune has been sporadically announced in epidermolysis bullosa acquisita.

No cutaneous examination is finished without a cautious assessment of the nails. Nails remain an understudied but then very open structure that loans itself for examination and evaluation.

In our examination, contaminations were observed to be the most widely recognized condition. Keeping the nails perfect, dry and cut is basic to keep up cleanliness and avert diseases.

In this period of well-created cosmetology world, nail turns into a zone of stylish concern and needs further investigations for preventive measures.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil
References


Clinical Types of Vitiligo

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Abstract

To study the clinical types of vitiligo seen in the vitiligo clinic in our hospital. Vitiligo is an acquired, progressive melanocytopenia of unknown etiology. It is characterized by circumscribed achromic macules to patches often associated with leukotrichia. Overall prevalence is 1%.

Even though there is no sex predilection, it is commonly seen in females.

Various theories like autoimmune theory, genetic, neural, and biochemical theory have been proposed.

Keywords: leukotrichia, melanocytopenia, achromic macules

Introduction

Among which autoimmunity seems to play a significant role, as it is associated with other autoimmune diseases such as diabetes mellitus, thyroid disorders, hyper-parathyroidism, psoriasis, alopecia areata, rheumatoid arthritis, SLE, hypertension, etc.

Vitiligo is usually symmetrical, commonly involving face, lips, hands, arms, legs and genitals. It can be classified into segmental, acrofacial, generalised and universal or by pattern of involvement as focal, mixed and mucosal types. Various other morphological forms include trichrome, quadrichrome, pentachrome, blue and inflammatory vitiligo¹.

Methodology

A cross sectional study was done with 50 patients diagnosed with vitiligo (all types). All the patients were subjected to

- Complete history
- Complete physical examination

<table>
<thead>
<tr>
<th>Types</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitiligo vulgaris</td>
<td>60%</td>
</tr>
<tr>
<td>Segmental vitiligo</td>
<td>9%</td>
</tr>
<tr>
<td>Mucosal vitiligo</td>
<td>30%</td>
</tr>
<tr>
<td>Acral vitiligo</td>
<td>1%</td>
</tr>
</tbody>
</table>

Discussion

Hair over the lesion may be either normal/ white. It can also be associated with cutaneous/ ocular/ auditory/ systemic disorders (hyperparathyroidism, hypothyroidism, adrenal cortical insufficiency, pernicious anemia, diabetes mellitus, lupus, psoriasis, rheumatoid arthritis). The present study is done to know about the epidemiology of Vitiligo in an urban city hospital².

Conclusion & Recommendations

Total of 50 patients were included in the study. Vitiligo vulgaris is found to be the most common type among these patients with a percentage of 60. It is followed by mucosal (30%), Segmental (9%) and acral vitiligo (1%).

For effective management of vitiligo, early diagnosis and early treatment will improve the quality of life of the patient and prevents the further progression of the disease³.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References


A Study of Childhood Psoriasis

Soorya B¹, Jayakar Thomas²
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Abstract

This study attempts to find out the incidence of childhood psoriasis and the mean age of onset of the disease in children. Psoriasis is a chronic immune mediated inflammatory disease.

It is characterized by Chronicity, inflammation and hyper proliferation. It presents as erythematous silvery white scaly plaques over the extensor aspects of extremities and trunk. Childhood psoriasis is not an uncommon entity.

Keywords: inflammatory disease, children, Psoriasis

Introduction

The true prevalence of childhood psoriasis is not known. It differs from adult psoriasis by age of onset, female preponderance, treatment options and clinical features.

It has bimodal age of onset, depending on this it is divided into two types – Type 1 usually starts by 15-40 years of age and consist of >75% of cases and has strong association with HLA Cw6. Type starts after 40 years and is less severe form. Psoriasis is not uncommon in childhood¹.

Methodology

A cross sectional study was done with 100 children diagnosed with psoriasis (all types). All the patients were subjected to

- Complete history
- Complete physical examination

<table>
<thead>
<tr>
<th>Clinical types</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaque psoriasis</td>
<td>47%</td>
</tr>
<tr>
<td>Guttate psoriasis</td>
<td>23%</td>
</tr>
<tr>
<td>Erythrodermic psoriasis</td>
<td>5%</td>
</tr>
<tr>
<td>Palmo plantar psoriasis</td>
<td>25%</td>
</tr>
<tr>
<td>Pustular psoriasis</td>
<td>0%</td>
</tr>
</tbody>
</table>

True prevalence of childhood psoriasis is not exactly known yet. The earlier the onset, the worse is the prognosis. In children, lesions may be physically disfiguring and will have psychological impact².

Discussion

Typically childhood psoriasis presents as guttate form, but in India plaque type is the commonest. Rare types are erythrodermic psoriasis, pustular psoriasis and psoriatic arthritis. Precipitating factors for childhood psoriasis are infections, obesity, stress, vaccination and trauma. Palms and soles involvement is rare. Nail involvement occurs in one third of cases³.

Extract From Some Studies:

In children pityriasis amiantacea represents scalp psoriasis of adults. Psoriasis can occur in infants and they usually affect napkin area. Genital Flexural psoriasis and periumbilical regions are common manifestation of disease in infancy⁴.

Basic Needs & Importance:

The remission rate in children is higher than adults. They are used for milder form of the disease. For moderate to severe disease narrow band UVB and systemic therapies are used. Systemic therapy is not well accepted in children due to accumulation of drugs, low acceptance, and risk of teratogenicity⁵.

Conclusion & Recommendations

Total of 100 patients were included in the study. Plaque type of is found to be the most common type
among these patients with a percentage of 47%. It is followed by palmo plantar psoriasis (25%), guttate (23%) and erythrodermic psoriasis (5%).

More clinical studies are required to explain the safety levels of phototherapy, systemic therapies and biologic for the treatment of childhood psoriasis which may provide promising future.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**

Review Article

Congenital Heart Diseases and Its Impact in Mordern Times

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Abstract

This following research is done on the study of the prevalence, age wise distribution and clinical spectrum of congenital heart disease. It is the leading cause of infant mortality in the recent decade. Our recent studies and improvements in various fields of medicine show promising treatment and prognosis and the level of mortality is expected to fall in the future.

This study was conducted with reference to over 1200 patients who were diagnosed with congenital heart disease. A prevalence of 26.4 Per 1000 persons was observed in the last decade.

The magnitude of the problems puts the patient for a long time effects and patients were forced for various lifestyle changes. Ventricular septal defect was the commonest lesion followed by the atrial septal defect. Tetralogy of fallot was the commonest cyanotic heart disease. Maximum number of childrens with heart disease were diagnosed between 0 to 3 years of age.

Keywords: mortality; long term effects; lifestyle changes

Introduction

Congenital heart disease is defined as the presence at birth of a gross structural abnormality of the heart, great arteries or great veins that is actually or potentially of functional significance. Congenital heart disease accounts nearly one-third of all major congenital abnormalities. Only in 1930, there was a growing interest in congenital heart disease. Early attempt of cardiac shunt procedures were made in 1940. In 1950’s, the development of heart-lung bypass machine made the era of cardiac surgery possible. From this origins most patients were able to reach adulthood. The number of adults with some form of congenital heart disease is growing rapidly and the therapy becomes increasingly effective due to the advancements in modern era.

Magnitude of the problem: Congenital heart disease (chd) are relatively common with a prevalence ranging from 3.7 To 17.5 Per 1000 live births. According to a status report on congenital heart disease on india, 10% of the present infant mortality maybe accounted for by chd. The prevalence of chd is not uniform across the country. The incidence of chd does not appear to be changing substentially over time. What has changed substentially over the last 20 to 30 years is the survival data of the patients. Approximately 20000 cardiac surgical procedures are performed for congenital heart disease per year. Various modern diagnostic methods and surgeries have paved way to increased pre intervention before complications and survival capacity in various childrens.

Types of congenital heart diseases

Common examples of congenital defects that may be missed in childhood thus diagnosed for the first time in adults life including atrial septal defect, pulmonary stenosis, bicuspid aortic valve and coarctation of aorta. In some patients unoperated chd, the defect is relatively mild and surgical or other intervention has not been required. Alternately, patients may have a significant structural abnormalities that is amendable to surgical intervention. Majority of adults with chd will have had some type of surgical intervention in the past. Patients who have had some operative intervention for their chd fall into two major category. In one group survival to adulthood was expected despite the presence of their congenital defect, but their quality of life or longevity has been enhanced due to their operative intervention.
In second group of patients, their survival to adulthood is related solely or chiefly due to their surgical intervention.

Specific cardiac defects seen in the study

Bicuspid aortic valve:

Bicuspid aortic valve is reported to occur in 1-2% of the general population in which two of the leaflets of the aortic valve fuse during development in the womb resulting in a two leaflet valves (bicuspid valves) instead of the normal three-leaflet valves(tricuspid valves) . Patients with bicuspid aortic valve may have a normal lifespan without ever developing evidence of significant vascular disease . Bicuspid aortic valve may progress to aortic stenosis . Alternatively aortic valves maybe regurgitant leading to aortic regurgitation and ultimatelyo congestive heart failure . Patients with bicuspid aortic valve are at significant risk of developing infective endocarditis . Patients need to be instructed about the importance of prophylaxis against subacute bacterial endocarditis . In addition, patients with bicuspid aortic valve have structural abnormalities of their thoracic aorta (cystic medial necrosis) and risk of aortic dissection.

Coarctation of aorta:

It is the narrowing of the aorta. It is associated with other heart conditions. It usually presents with no symptoms and the condition often isn’t detected until adulthood. Patients present with enlarged heart and murmur. It is seen in adults as a discrete narrowing of the aorta at the level of ligamentum arteriosum. When a patient has a coarctation the left ventricle has to work harder. It is twice common in boys than in girls. It is seen in Turner’s syndrome. Patients with coarctation of aorta may have hypertension in upper extremities but have low blood pressure and decreased pulse in their lower extremities. 50% to 80% of patients have a associated bicuspid aortic valve. Patients are also at risk for accelerated coronary artery disease. Once the diagnosis of coarctation of the aorta has been made and the presence of significant obstruction (750 mm hg) has been confirmed, correction is warranted. Mortality for unoperated coarctation of the aorta is 30% and 75% of the patients will be dead by age 50 if unrepaired. Surgical treatment resection of coarcted segment with a patch angioplasty or resection with placement of an interposition tube graft. Ballon aortoplasty and stenting is also an option but is still considered experimental.

Atrial septal defect:

Atrial septal defect is a common form of congenital heart disease and a one of the most common diagnosis among adults with congenital heart disease. Ostium secundum defect (in the central position of the atrial septum) is the most common occurring in 75% of the case. It presents as a hole in the wall between the heart’s upper chamber (atria). The presence of a left to right shunt results in a volume overload of the right atrium, right ventricle and pulmonary arteries which places patients at risk of developing right heart failure and atrial arrhythmias. Survival beyond the age of 40 to 50 occurs in less than 50% of patients with large shunts and majority of surviving patients over the age of 50 will be symptomatic with dyspnea, fatigue, and palpitation. Because of the long-term morbidity associated with unpaired atrial septal defect, surgical closure of the defect is recommended when the diagnosis made unless there is evidence of severe pulmonary vascular diseases.

Ventricular septal defect:

Ventricular septal defect is the most common form of congenital heart disease. The defect is due to the abnormal connection between the lower chamber of the heart. It is often diagnosed at birth, but it can occur in adult after surgery or a heart attack. The patients present with bluish tint to the skin, lips and fingernails, enlarged heart and murmur, shortness of breath. The incidence of ventricular septal defect has increased from 1.0 to 1.6 per 1000 live birth in recent years. The increase in incidence is due to improved detection of small, isolated ventricular septal defect by modern diagnostic technique such as echocardiogram, electrocardiogram, cardiac catheterization. Adults having ventricular septal defects have lifelong risk of bacterial endocarditis usually involving tricuspid valves.

Pulmonic stenosis:

It is a condition characterised by obstruction to blood flow from the right ventricle to the pulmonary artery. It can be due to isolated valvular (90%), subvalvular or supravalvular obstruction. It comprises approximately 10% of all congenital heart disease. A slight female predominance exists. Patients with mild to moderate pulmonic stenosis are usually asymptomatic. The degree of stenosis may progress over time. The treatment with ballon valvuloplasty, the stenosis can be successfully relived in all cases. There is a risk of
endocarditis. The prevalence is 1.65/1000 Live births in recent years.

Patent ductus arteriosus:

The diagnosis is usually made in childhood. It is a condition wherein the ductus arteriosus fail to close after birth. Patients present with shortness of breath, tachycardia, machine like heart murmur. Patent ductus arteriosus is idiopathic. The risk factors includes premature births, congential rubella syndrome, chromosomal abnormalities. Prevention includes administration of indomethacin on the first day of life of premature infants. The patients having patent ductus arteriosus should be referred for closure of ductus for survival. Closure is done either via surgical technique or catheter based technique. Patients with large shunts are at risk, for developing severe pulmonary vascular diseases with shunt reversal (eg/- eisenmenger syndrome). Once pulmonary vascular disease develope, closure is contradicted.

Tetralogy of fallot:

The components of tetralogy of fallot include a large ventricular septal defect, an aorta which overrides both the right and left ventricle, stenosis of the right ventricular outflow tract( which may be below, at or above the pulmonic valve level) and right ventricular hypertropy. This condition of defects results in cyanosis due to inadequate pulmonary blood flow and right to left shunting across the ventricular septal defect. The vast majority of patients present with cyanosis at birth. Only 66% of patients will be alive at one year, 40% at three years, 11% by the age of twenty, 6% by the age of thirty and 3% by the age of forty. Survival above 60% is rare. Patients present with blue tinged skin and shortness of breath and heart murmur. Treatment is carried surgically to increase pulmonary blood flow thus decresing the level of cyanosis. Operations such as waterston shunt, potts shunt, and blalock-taussing shunt provide substantial relief of cyanosis and improved survival and quality of life. Post operative surgical interventions is imperative, because long term shunts may cause inoperable pulmonary vascular disease. Most significantly patients with repaired tetralogy of fallot are at risk for arrhythmias (mostly atrial arrhythmias) manifests years after the original surgery. Sudden mortality may occur in advanced ages (0.5% To 7%). The sudden death may be due to ventricular arrhythmias although it is not clearly demonstrated.

Conclusion

This overview demonstrates, the signs, treatment, and prevalence of the congenital heart diseases. These patients are care by pediatric cardiologist usually. It is a chronic disease which has lasting effect on both the patient and his or her family. There is some evidence that patients with congenital heart disease may be at increased risk of psychiatric illness such as depression and panic disorders although this is not clearly proven. Mortality rates have decreased in the recent years due to the various improvements in the medical field by diagnosing the defects at birth and improving the survival and way of life of the patients. There will be significant reduction in the complications in future due to the technical advancements we would see in the upcoming future.

Ethical Clearance- no ethical clearance was necessary for this research work.

Source of Funding- Self funded project

Conflict of Interest - Nil

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Histopathological Study of Different Clinical Types of Leprosy

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Abstract

To study the histopathological features of different clinical types of leprosy. Leprosy is a chronic disease caused by Mycobacterium leprae, infectious in some cases and affecting the peripheral nervous system, the skin, and certain other tissues like the bones, eyes, reticuloendothelial system, kidney and testes.

Mycobacterium leprae is a capsulated, straight or slightly curved, non-motile, non-sporing, acid-fast, rod shaped organism. The polar forms of leprosy are the tuberculoid leprosy and lepromatous leprosy. The sub-polar forms are the borderline tuberculoid, borderline - borderline and the borderline lepromatous.

Keywords: leprosy, lepromatous, Mycobacterium leprae

Introduction

Leprosy or Hansen’s disease or Hanseniasis is a chronic disease caused by Mycobacterium leprae which is an acid-fast organism. Mycobacterium leprae is an obligate intracellular parasite seen predominantly within the macrophages. It is the only mycobacterium that infects the peripheral nerves.

Many classification systems of leprosy exist. The Ridley and Joplig Classification is the five systems of classification consisting of Typical tuberculoid (TT), Borderline tuberculoid (BT), Borderline - borderline, Borderline Lepromatous and Lepromatous leprosy (LL).

Methodology

We conducted a cross sectional study of 20 patients diagnosed with leprosy. The recruited patients were subjected to full history taking, thorough general and dermatological examination, skin smear study and skin biopsy for histopathology.

<table>
<thead>
<tr>
<th>TYPE OF LEPROSY</th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Typical Tuberculoid</td>
<td>1 (5)</td>
</tr>
<tr>
<td>2. Borderline Tuberculoid</td>
<td>8 (40)</td>
</tr>
<tr>
<td>4. Lepromatous Leprosy</td>
<td>4 (20)</td>
</tr>
<tr>
<td>5. Histoid Leprosy</td>
<td>2 (10)</td>
</tr>
</tbody>
</table>

The other types of leprosy are Pure Neuritic leprosy, Histoid leprosy and Lepra Manchada.

The three cardinal signs of leprosy are hypopigmented, anaesthetic patch, nerve enlargement and demonstration of Mycobacterium leprae in slit skin smears. Other symptoms are glove and stocking type of anesthesia, paralysis, epistaxis, pedal edema and subcutaneous nodules in histoid leprosy.

Basic Needs & Importance:

The common investigations done are slit skin smear and skin biopsy.

A 4mm punch biopsy is taken from the skin lesion and the histopathological features are studied.

The histopathological feature of TT is thinning of epidermis with perivascular and periappendageal inflammatory infiltrates consisting of lymphocytes and epitheloid cells with Langhan’s giant cells and tuberculoid granuloma in the dermis.

Extract From Some Studies

The Borderline tuberculoid spectrum shows thinned out epidermis, with periappendageal and perivascular infiltrates consisting of lymphocytes with foreign body giant cells and granuloma formation in the dermis.

The Borderline lepromatous type of leprosy shows atrophic epidermis with subepidermal clear zone and macrophage granuloma in the dermis. The Lepromatous
leprosy shows atrophic epidermis with subepidermal clear zone, with foamy macrophages containing bacilli and macrophage granuloma in the dermis.

Discussion

Histoid leprosy shows atrophic epidermis with subepidermal clear zone, with lesion in lower dermis and subcutis with pseudocapsule formation. The lesion consists of spindle shaped cells.

Treatment of leprosy is Multi drug therapy which is paucibacillary if the lesions are 2 to 5, one or no nerve involved or multibacillary if the lesions are more than 5 and one or more nerve involved.

Conclusion & Recommendations

A total of 20 patients were included in our study consisting of 14 male and 6 female patients. The age group was between 30 to 68 years. Out of the 20 patients, the borderline tuberculoid spectrum was the commonest with the histopathological feature of thinned out epidermis, with peri-appendageal and perivascular infiltrates consisting of lymphocytes with foreign body giant cells and granuloma formation in the dermis.

We conclude that the different types of leprosy have its characteristic histopathological features. The commonest type of leprosy in our study was the Borderline tuberculoid leprosy.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References

Histopathological Correlation of Lipodermatosclerosis

S.R.Sruthy¹, Jayakar Thomas¹
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Abstract

To watch Histopathological discoveries in patients with clinical findings of lipodermatosclerosis. Lipodermatosclerosis (LDS) is a restricted unending irritation and fibrosis of skin and subcutaneous tissues of lower appendages, as a sequalae of ceaseless venous hypertension.

The pathogenesis is multifactorial, coming about because of exceedingly complex cooperations happening in and around the endothelial cell, including enormous assortment of cytokines, development factors and MMP’s.

Keywords: Histopathological, Lipodermatosclerosis, hypertension

Introduction

Clinically it is seen progressively regular in ladies with high BMI and displays also characterized, indurated plaques around the lower limits more often than not on the average angle. LDS in intense stage is portrayed by diffuse provocative edema, erythema and delicacy of the skin and in perpetual state described by indurated zones of pigmentation and fibrotic narrowing of the lower leg. There are various reports on the histopathological discoveries of LDS. Subsequently an endeavor is made to depict histopathological discoveries in LDS.

Methodology

A sum of 5 patients with endless Lipodermatosclerosis were incorporated into the investigation. All patients were exposed to

- Complete history
- General and Dermatological Examination
- Consenting patients were exposed to punch biopsy of the lower appendages.

Lipodermatosclerosis, otherwise called “sclerosing panniculitis,” is a fiery procedure of the subcutaneous fat that intensely introduces as average lower leg torment, erythema, delicacy, and warmth.

Endless infection is outstanding for “bound down, sclerotic” hyperpigmented, lower furthest point skin in a “transformed champagne bottle” appearance. These progressions are identified with venous inadequacy with resultant extravasation of fine substances. Pathogenesis theories include:

A. Fibrin sleeve development prompting hypoxia

B. Elevated grid metalloproteinase and fibrinolytic middle person movement causing collagen annihilation and ulceration

C. Leukocyte-intervened endothelial harm.

Extract From Some Other Studies

Histology is eminent for the accompanying movement that incorporates thickening of the pannicular septa and mellow penetration of fiery cells prompting early focal adipocyte putrefaction, fibrosis of the septa with stringy strands anticipating halfway into the fat lobule, lipid filled macrophages and lessening in useful adipocytes, and eosinophilic pseudomembrane arrangement on H&E thought to an outcome of adipocyte breakdown.
Discussion

This grouping of occasions can be an outcome of any procedure prompting fiery cell penetrate, including edema and medication reaction. Lipodermatosclerosis is analyzed dependent on the nearness of trademark signs and indications.

Skin biopsy or blood tests are typically not required to affirm a finding but rather can be performed in uncommon cases. ultrasound and attractive reverberation imaging (MRI) might be utilized to acquire more data with respect to the seriousness of the condition and to decide the best treatment approach.

Basic Needs & Importance:

Lipodermatosclerosis is essentially treated with pressure treatment to improve venous deficiency. Different modalities for overseeing venous deficiency incorporate leg rise; not sitting or remaining in one spot for significant lots of time; ordinary exercise; and weight reduction if overweight or fat.

Some influenced individuals may expect meds to counteract blood thickening; decrease torment and irritation; as well as increment blood stream. Contingent upon the seriousness of the condition and the reaction to starting medicines, vein medical procedure might be suggested.

Conclusion & Recommendations

Histopathology of 5 cases contemplated, 4 indicated epidermal decay. Increment in pigmentation of basal layer was noted in 3 cases. Dermal changes were evident in 3 cases, indicating edematous changes, pseudo-scleroderma changes, gentle septal invades. 2 cases indicated extravasation of RBC’s. No proof of panniculitis was noted.

Histopathological discoveries of LDS are predictable with epidermal diminishing, increment pigmentation, pseudoscleroderma changes, extravasation of RBC’s and with incessant fiery invades.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References

A Study about Incidence of Inflammatory Bowel Disease in Psoriasis Using Scopy

P Keerthana Bhasakr¹, Jayakar Thomas²
¹Junior Resident, ²Professor, Department of Dermatology, Sree Balaji Medical College & Research Institute

Abstract

This investigation endeavors to discover the rate of IBD in psoriasis utilizing Scopy. This study incorporates 50 psoriasis patients. Psoriasis and IBD are ceaseless, fiery malady sharing invulnerable pathogenetic instruments.

The most significant hereditary relationships include the chromosomal loci 6p22, 16q, 1p31, and 5q33 which guide a few qualities associated with intrinsic and versatile resistance.

Keywords: IBD, Psoriasis, pathogenetic instruments

Introduction

Extended vulnerability of the epidermal limit in skin and stomach related framework underlies the expanded relationship of allergens and pathogens with red hot receptors of safe cells. The resistant response among psoriasis and IBD is near and contains phagocytic, dendritic, and basic killer cell, close by a milieu of cytokines and antimicrobial peptides that strengthen T-cells.

The particular similitudes in the pathogenesis are likewise reflected in the wide covering of their restorative methodologies. There is proof Th1 and Th17 and administrative T-cells and cytokine ¹.

Methodology

This is a review concentrate done at the Department of Skin and Sexually Transmitted sicknesses of a tertiary consideration medical clinic in South India. Endoscopy was done to the psoriasis patients to preclude IBD.

<table>
<thead>
<tr>
<th>Study of Patients</th>
<th>Number%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PSORIASIS(alone)</td>
<td>48(50)</td>
</tr>
<tr>
<td>2. IBD</td>
<td>2(50)</td>
</tr>
</tbody>
</table>

Discussion

There are two pathogenetic minutes, including inborn invulnerability activated by obscure improvements and versatile insusceptibility because of cytokines discharged from cells of the natural safe framework.

Th2 and assume a key job in incendiary procedures and tissue harm in ceaseless conditions, for example, psoriasis, immune system uveitis, adolescent diabetes, rheumatoid joint inflammation, Crohn’s malady, and different sclerosis².

Th17 demonstrates significant capacity in antimicrobial resistance on epithelial and mucosal boundaries through the generation of cytokines(IL-22) which invigorate epithelial cells to synthetize antimicrobial proteins.

Extract From Some Other Studies:

In this way, absence of Th17 cells may prompt expanded defenselessness to pioneering contaminations and hyper-IgE disorder.
Th17 separation is by all accounts the nearness of TGF and IL-6 in the microenvironment in which T-naïve cells remain.

IL-23 is associated with the advancement of explicit populaces of Th17 cells, yet neglected to demonstrate separation².

**Basic Needs & Importance:**

Th17 cells limit have a critical activity in various resistant framework sicknesses and infections. The IL-17 that they produce progresses the chemotaxis of neutrophils and monocytes and the development and commencement of T lymphocytes and neoangiogenesis.

Beside psoriasis, Th17 cells have been related to other combustible skin infections, for instance, ominously helpless contact dermatitis, atopic dermatitis, essential sclerosis, and Behcet’s sickness close by other skin conditions likw Acanthosis and parakeratosis.

The authoritative T cells/T-silencers are a subpopulation of T cells spoke to significant specialist in smothering the surprising activation of the resistant structure to keep up a key separation from unreasonable responses and to shield the strength to self in different organs, including stomach related framework and skin.

The excitement for these cells has extended starting late in association with their possible use in the treatment of immune system ailment³.

**Conclusion & Recommendation**

Out of 50 patients considered, 2 patients had incendiary inside illness.

Psoriasis and IBD are provocative infections constantly related, sharing resistant pathogenetic systems. They speak to hindrance and association between the internal and the external sides of the human body. Hence, at these dimensions, insusceptible procedures assume a key job in keeping up homeostasis and in continuing obsessive procedures.

Psoriasis and IBDs bolster the theory of a typical pathogenesis which is found in helpful covering of both.

**Ethical Clearance**- No ethical clearance was necessary for this research work.

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**


Clinical Study of Different Types of Ichthyoses

P. Keerthana Bhaskar¹, Jayakar Thomas²
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Abstract

To study the different types of ichthyoses, ichthyoses are a clinically and hereditarily heterogeneous gathering of skin issue, described by diffuse, for the most part uniform and determined example of scaling. It is a disorder of keratinization. It can be congenital or acquired. Ichthyoses result from strange epidermal separation or digestion. Blemished epidermal desquamation, prominent inflammatory component, associated with epidermal hyperproliferation is seen in ichthyoses.

Keywords: hyperproliferation, Ichthyoses, ichthyoses

Introduction

Ichthyoses is a group of disorder characterized by dry skin with measuring all over the body. It is a disorder of cornification. The ichthyoses can be congenital or acquired. Ichthyoses result from abnormal epidermal differentiation or metabolism. Congenital ichthyoses are ichthyosis vulgaris, X-linked recessive ichthyosis, non-bullous ichthyosiformerythroderma, lamellar ichthyosis, harlequin ichthyosis, bullous ichthyosiformerythroderma, ichthyosis bullosa of Siemens and ichthyosis hystrix.

Methodology

We conducted a cross sectional study of 20 patients diagnosed with Ichthyoses both congenital and acquired attending Dermatology outpatient department. The recruited patients were subjected to full history taking, thorough general and dermatological examination.

<table>
<thead>
<tr>
<th>TYPE OF ICHTHYOSIS</th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ichthyosis vulgaris</td>
<td>6 (30)</td>
</tr>
<tr>
<td>2. Bullous ichthyosiformerythroderma</td>
<td>1 (5)</td>
</tr>
<tr>
<td>3. Lamellar ichthyosis</td>
<td>1 (5)</td>
</tr>
<tr>
<td>4. Leprosy</td>
<td>3 (15)</td>
</tr>
<tr>
<td>5. Hypothyroidism</td>
<td>4 (20)</td>
</tr>
<tr>
<td>6. Drugs</td>
<td>5 (25)</td>
</tr>
</tbody>
</table>

Discussion

Ichthyoses is a group of disorder characterized by dry skin with measuring all over the body. It is a disorder of cornification. The ichthyoses can be congenital or acquired. Ichthyoses result from abnormal epidermal differentiation or metabolism. Congenital ichthyoses are ichthyosis vulgaris, X-linked recessive ichthyosis, non-bullous ichthyosiformerythroderma, lamellar ichthyosis, harlequin ichthyosis, bullous ichthyosiformerythroderma, ichthyosis bullosa of Siemens and ichthyosis hystrix.

Extract From Some Studies:

The ichthyosiform disorders are Netherton’s disorder, Sjögren–Larsson disorder, Chanarin–Dorfman disorder, Refsum’s ailment, Kallmann’s disorder, Multiplesulphatasedeficiency disorder, Conrad–Hünemann-Happle disorder IBIDS, KID syndrome, CHILDS syndrome, Ichthyosis follicularis with alopecia and photophobia and Neu–Laxova disorder.

Ichthyosis vulgaris is the most widely recognized of the acquired ichthyoses, with autosomal overwhelming legacy.

The skin is dry and layered in the neonatal age, yet more as a rule scaling is clear from 2 months of age. The scale is white or dim, little, branny, and semi-disciple with turned-up edges. It is most regular on the extensor surfaces of the arms and lower legs, and typically saves the flexural creases.
The storage compartment, particularly the stomach divider, is frequently mildly affected and the nappy (diaper) region is saved.

Bullous ichthyosiform erythroderma is an autosomal dominant issue of keratinization which is related with rankling in its initial stage. It is generally called epidermolytic hyperkeratosis. It normally gives delicate skin which offers approach to dynamic hyperkeratosis.

A mild, generalized erythroderma is available during childbirth. Limp blisters, peeling and shallow disintegrations at locales of minor injury or friction are evident inside the initial couple of long stretches of life.

Different highlights are palmoplantar hyperkeratosis bringing about repetitive agonizing fissures, contractures, sclerodactyly and foot distortion with impaired function. Lamellar ichthyoses is an autosomal passive disorder. During childbirth there is nearness of collodion layer. The scales are enormous, dim darker or dim and firmly adherent. In serious cases the scales are thick, unbending scale which irregularly shed or parts, causing erythematous patches and profound, difficult gaps, particularly around flexures and on the digits, palms and soles.

**Basic Needs & Importance:**

This are the original causes for acquired ichthyoses are malnutrition, malabsorption, essential fatty deficiency, Shwachmanson syndrome, renal failure, primary hyperparathyroidism, hypopituitarism, hypothyroidism, diabetes, sarcoidosis, leprosy, HIV, GVHD, myelodysplasia, underlying malignancy like Hodgkin’s lymphoma and due to drugs like nicotinic acid, cimetidine, allopurinol, hydroxyurea and clofazamine.

Treatment is by application of topical emollients, liquid paraffin and keratolytics. The emollients must be applied at regular intervals. Genetic counselling is important in patients with family history of ichthyoses disorder.

**Conclusion & Recommendations**

A total of 20 patients were included in our study. The age group was between 7 years and 50 years. Among the study population, 30% had ichthyoses vulgaris, 25% had acquired ichthyoses due to drugs, 20% due to hypothyroidism, and 15% due to leprosy, 5% due to bullous ichthyosiformerythroderma and 5% due to lamellar ichthyoses.

Ichthyoses vulgaris was found to be the commonest in our study. Regular follow-up with topical emollients are advised for these patients. Genetic counselling must be given for those patients with family history of ichthyoses as a preventive measure.

**Ethical Clearance** - No ethical clearance was necessary for this research work

**Source of Funding** - Self funded project

**Conflict of Interest** - Nil

**References**

A Study on Impetigo - Causative Agents

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Abstract

To study the causative agents of Impetigo.

Impetigo is a superficial, contagious, pyogenic infection of the skin. It is the most common skin infection in children. It is of two types, bullous and non-bullous impetigo.

Staphylococcus aureus is the commonest organism causing bullous impetigo, non-bullous type is caused by staphylococci and streptococci or both in combination.

Keywords: Staphylococcus, pyogenic infection, skin

Introduction

Impetigo is a contagious, superficial bacterial infection of the skin. It is the most common skin infection in children. Clinically impetigo can be divided into the bullous and non-bullous forms¹.

Bullous impetigo is a superficial cutaneous infection with staphylococcus aureus. Non-bullous impetigo can be caused by both staphylococcus aureus and streptococcuspyogenes.

Preschool and young school-age children are most often affected. Over-crowding, poor hygiene, scabies, fomites predispose to these infection.

Non-bullous impetigo starts as a thin-walled vesicle on an erythematous base which ruptures rapidly with exuding serum that dries to form yellowish brown crusts.

Methodology

We conducted a cross sectional study of 20 patients diagnosed with Impetigo attending our Dermatology outpatient department. The recruited patients were subjected to full history taking, thorough general and dermatological examination, and investigated for pus culture and sensitivity from the skin lesion or blister fluid².

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<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Staphylococcus aureus</td>
<td>6 (30)</td>
</tr>
<tr>
<td>2. Streptococcus pyogenes</td>
<td>10 (50)</td>
</tr>
<tr>
<td>3. Others</td>
<td>4 (20)</td>
</tr>
</tbody>
</table>

Extract From Some Studies:

Gradual and irregular peripheral extension occurs without central healing. The crusts dry and separate to leave erythema,

which heals without scarring. The common sites involved are face, around the nose and mouth, and the limbs. The common age group affected are preschool and primary school children.

In bullous impetigo, the bulla are larger and persist for 2 or 3 days. The contents are first clear, later cloudy. They rupture to leave behind thin, flat, brownish crusts³.

Basic Needs & Importance:

Central healing with peripheral extension may give rise to circinate lesions. Face, body and buccal mucous membrane are the common sites involved. Neonates and infants are commonly affected.

The complications of streptococcal impetigo are poststreptococcal acute glomerulonephritis, urticaria, scarlet fever, erythema multiforme and cellulitis⁴.
Discussion

The investigations done are pus culture and sensitivity from the blister fluid to find out the organism involved.

Treatment is with topical antibacterials like mupirocin, neomycin and fusidic acid and systemic antibiotics.

Conclusion & Recommendations

A total of 20 patients were included in our study. The age group was between 8 months to 7 years of age. Impetigo was commonly seen in school-age children. The non-bullous type was the commonest type of impetigo in our study. Out of the 20 patients, 50% had growth of streptococcus pyogenes, 30% had staphylococcus aureus growth and 20% had growth of other organisms.

Non-bullous impetigo in school-age children was the commonest type of impetigo in our study. Preventive measures like education on proper hygiene, encouraging hand washing, avoidance of overcrowding, prompt treatment of scabies must be implemented in these patients.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil

References


Incidence of Pure Neuritic Leprosy among Patients attending Leprosy Clinic

T. Shri Sindhuja¹, Jayakar Thomas²
¹Junior Resident, ²Professor, Department of DVL, Sree Balaji Medical College & Hospital, Chromepet

Abstract

To study the incidence of pure neuritic leprosy among patients attending Leprosy clinic in Department of DVL, SBMCH. Pure neuritic has been recognized as a distinct sub group of leprosy, by Indian Association of Leprologists. It constitutes a good percentage of leprosy cases reported from India, which contributes to more than half of global leprosy numbers.

Unfortunately, a large number of these patients present with Grade 2 disability at the time of initial reporting itself due to the early nerve involvement and late recognition of symptoms.

By definition, a diagnosis of pure neuritic leprosy is made when, skin lesions are absent, presence of nerve thickening and anesthesia along the distribution of the affected nerve, deformity and/or trophic changes.

Keywords: leprosy, Pure neuritic

Introduction

On follow-up, skin lesions are noted to develop in up to 20% of pure neuritic leprosy cases, in turn indicating its progression to manifest as a cutaneous disease. For further confirmation of diagnosis of pure neuritic leprosy, nerve biopsy, and/or nerve conduction studies can be done¹.

‘Wade’ in 1952 was the first to recognize poly-neuritic cases as a separate group. IAL consensus classification of leprosy in 1981 persisted with ‘Pure neuritic leprosy’ as one of types of leprosy.

Upper limb nerves are more commonly involved. Ulnar nerve is the most commonly involved nerve in upper limb. Lateral popliteal nerve is the most commonly affected nerve in lower limb.

Methodology

A cross sectional study of 50 patients diagnosed with Hansen’s disease (all types).

Investigations done were

- Thorough history taking
- Inspection to rule out presence of hypopigmented hypoanesthetic patch
- Complete examination to fulfill criteria of PNL
- Nerve examination to confirm presence of AFB or nerve conduction study

| Number of Mononeuritic PNL | 6 |
| Number of Polyneuritic PNL | 10 |
| Total number of PNL recorded | 16 |

Basic Needs & Importance

Any nerve trunk can be involved by PNL, eg: supra orbital nerve, great auricular nerve etc. PNL constitutes about 4-11% of leprosy patients as reported by various Indian studies. It is reported higher in south India, up to 18% of new cases. Males are more commonly effected, between 15-35 years of age².

It is reported less in other parts of world such as Africa, where MB leprosy is more common.
PNL confirmation is best done by nerve biopsy, especially from a branch of a sensory nerve.

Extract from some case studies/life scenarios:

Any nerve trunk can be involved by PNL, e.g., supra orbital nerve, great auricular nerve etc. PNL constitutes about 4-11% of leprosy patients as reported by various Indian studies. It is reported higher in south India, up to 18% of new cases. Males are more commonly affected, between 15-35 years of age.

It is reported less in other parts of the world such as Africa, where MB leprosy is more common.

PNL confirmation is best done by nerve biopsy, especially from a branch of a sensory nerve.

Complications of PNL include nerve abscess.

**Conclusion & Recommendations**

Total of 50 patients were included in the study. 16 patients (32%) had pure neuritic leprosy. Of the 16 cases, 6 patients (12%) had mononeuritic and 10 patients (20%) had polynueritic type of pure neuritic leprosy. Most common nerve involved was ulnar nerve.

**Conclusion**

Management of pure neuritic leprosy requires multidrug therapy along with appropriate dose of systemic corticosteroids. Measures for pain management, self-care of limbs and physiotherapy are important to prevent as well as manage disabilities in this group of patients.

Effective management can be brought about by early diagnosis and initiation of treatment.

**Discussion**

Subsequent development of skin lesions (most commonly, borderline tuberculoid) is well known, with many case reports in the published literature.

The fact the skin lesions are observed in PNL cases over months and years, indicate that PNL is an early form of leprosy in some patients. Identifying PNL (as a group) and clinically diagnosing PNL cases early, means identifying leprosy early, before skin is involved.

Early Identification of PNL and its treatment, naturally limits the extent and progression of nerve damage.

**Ethical Clearance** - No ethical clearance was necessary for this research work

**Source of Funding** - Self funded project

**Conflict of Interest** - Nil

**References**

Clinicopathological Study of Oral Leukoplakia

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Abstract

This study is to evaluate the possible etiological factors responsible, the epidemiological pattern, role of adjuvant vitamins and anti-oxidants in oral leukoplakia.

Persistent leukoplakia, has a potential for malignant transformation. Anti-oxidant supplements have beneficial effect in subjects with reduced risk factors.

Leukoplakia is the most common potentially malignant disorder of the oral mucosa, recently redefined as “a white plaque of questionable risk having excluded (other) known disorders that carry no increased risk factor for cancer”.

Keywords: leukoplakia, oral disorder.

Introduction

“A white patch or plaque that cannot be characterized clinically or pathologically as any other disease”.

In 2005 the definition was changed into: “A white plaque of questionable risk having excluded (other) known disorders that carry no increased risk factor for cancer”. It is therefore a diagnosis of exclusion from other oral white lesions such as leukokeratosis, infective lesions such as (candidiasis, syphilitic oral lesion, oral hairy leukoplakia),lichen planus, lupus erythematosus, dyskeratosiscongenita, white sponge nevus, submucosal fibrosis and frank carcinomas.

Methodology

A prospective study of a hundred patients presenting with oral white lesions. All patients were subjected to:

- Complete history
- Dermatological examination
- Biopsy

Extract from some case studies/life scenarios:

<table>
<thead>
<tr>
<th>Age group in years</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-40</td>
<td>22</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>36-56</td>
<td>27</td>
<td>22</td>
<td>49</td>
</tr>
<tr>
<td>56-75</td>
<td>15</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>76-90</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Our study included a hundred patients, out of which 65 were Male and 35 were Female. From100 cases of our study the most common site was found to be Buccal mucosa (46%), 16.5% of ulcerative leukoplakia were confirmed histologically to be malignant³.

Discussion

Leukoplakia is the most common potentially malignant disorder of the oral mucosa, recently redefined as “a white plaque of questionable risk having excluded (other) known disorders that carry no increased risk factor for cancer”.

Extract from some studies: The sore grows to rough appearance with surface crevices (thick homogeneous leukoplakia), certain sores create surface anomalies (granular or nodular leukoplakia), warty
papillary surface projections (verrucous leukoplakia), or blended red and white sores (dotted leukoplakia or erythroplakia). The remarkable variation that is proliferative verrucous leukoplakia is described by far reaching multifocal locales of inclusion frequently in patients with known hazard factors.

Those patients with idiopathic leukoplakia have the most astounding danger of creating malignant growth. Every now and again oral white patches happen, auxiliary to some recognizable neighborhood bothering. For instance, thickened hyperkeratotic sores are as often as possible seen over edentulous zones of alveolar edges (edge keratosis), ceaseless tongue biting (morsicatiolinguarum) or interminable cheek biting (morsicatiobuccarum).

**Basic Needs & Importance:**

Every single such sore are optional reactions to an incessant bothering which prompts compensatory hyperkeratosis of the epithelium creating as a defensive wonder, like the improvement of a callus.

Leukoplakia is the most well-known precancerous sore of the oral mucosa. Its involving factors, such as biting and smoking of tobacco is generally predominant in our nation. Oral disease is the commonest harm in Indian guys. We have discovered that 63% homogenous, 18% ulcerative, 16% nodular and 3% verrucous sort of injuries in this study.

**Conclusion & Recommendations**

Malignant transformation was seen in 23.5% of mild dysplasia and 54.5% of severe dysplasia. An antioxidant and multi vitamin supplement was administered apart from complete abstinence from alcohol and tobacco was done for a period of ten months which consisted of 4300 IU of vitamin-A.

**Ethical Clearance** - No ethical clearance was necessary for this research work

**Source of Funding** - Self funded project

**Conflict of Interest** - Nil

**References**

Assessment of Efficacy and Safety of Methotrexate in Chronic Treatment Resistant Urticaria

Jayakar Thomas
Professor, Department of Dermatology, Sree Balaji Medical College and Hospital, Chennai

Abstract
To evaluate the efficacy of methotrexate in the treatment of chronic spontaneous urticaria poorly responsive to antihistamines. Urticaria is a common condition affecting 15-20% of the general population at least once during their lifetime.

Females have a slightly higher prevalence (61%) than males. It clinically manifests as wheals, which are transient, well-defined, superficial erythematous or pale swellings of the dermis and usually associated with itching.

Keywords: resistant urticaria, methotrexate

Introduction
The lesions may appear pale centrally during the initial stage of fluid collection. Very rarely, a vesicle or a bulla can develop in an urticarial plaque. Wheals may vary in size (small or large), number (single or multiple) and may differ in shape, time of onset and duration. No mark is usually left behind when wheals resolve, but there may be secondary changes due to rubbing or scratching. Urticaria can affect any part of the body including the palms and soles. Systemic symptoms are often associated with urticaria.

Methodology
They are malaise, headache, abdominal pain, diarrhea, arthralgia, dizziness, syncope or even anaphylaxis.

Chronic urticaria is characterized by recurrent episodes occurring at least twice or week which last for 6 weeks or more. Causes of chronic urticaria are endocrine abnormality (e.g. hyperthyroidism), collagen vascular disease and malignant diseases (e.g. lymphoma, leukemia) or idiopathic. Diagnosis of chronic urticaria is often clinical, hence it requires guided investigations based on detailed clinical history and examination.

Extract from some case studies/life scenarios:
A down to earth way to deal with ceaseless idiopathic urticaria depends on the seriousness of the ailment and the patient’s response to treatment. Antihistamines are considered as first-line drugs for treating interminable idiopathic urticaria. Second-line medications incorporate foundational corticosteroids, polyclonal stabilizer, doxepin, nifedipine, leukotriene rivals, terbutaline, thyroxine and sulfasalazine. Third line medications are immunosuppressants like methotrexate, cyclosporine and biologicals like omalizumab. The present investigation is on the adequacy of methotrexate in the treatment of ceaseless unconstrained urticaria ineffectively reacting to antihistamines.

Discussion
This investigation incorporates 20 patients of ceaseless urticaria who are not reacting to antihistamines. A nitty gritty history was inspired including insights about length, history of advancement, recurrence of assaults, conveyance of individual sores, sustenance and nourishment added substances, past treatment, known unfavorable reactions, occupation and relaxation exercises, enquiry about the potential wellspring of
contamination, past and family ancestry of atopy, related sickness, for instance, fever, joint torments, thyroid, and other immune system illnesses, and an appraisal of the effect of the ailment on the patient’s personal satisfaction.

**Extract from some studies**

Complete physical and dermatological examination were done in all patients. Complete blood tally, differential white cell check, erythrocyte sedimentation rate (ESR), thyroid capacity tests were performed routinely. Fasting blood sugars, fasting lipid profile, liver capacity test, renal capacity tests and electrocardiogram were done in every one of the patients. Significant microbiological examinations were completed to affirm the clinical diagnosis. For urticarial vasculitis, skin biopsy was performed in all patients with sores going on for more than 24 hours. Patients were treated with MTX in the wake of decision out contraindications, for example, liver or lung ailment and positive serological tests for hepatitis B and C.

**Basic needs & importance:**

**Inclusion Criteria**

All patients (males and females above 18 years) attending skin OPD who are clinically diagnosed with urticaria are included in this study.

**Exclusion Criteria**

1) Pregnancy and lactation
2) Pulmonary tuberculosis - Active/old case of tuberculosis
3) Focal sepsis
4) Immunosuppression
5) Chronic liver/renal disease

A total of 20 patients with chronic urticaria were taken up for this study. 12 males and 8 females were affected. Seven patients with CIU treated with methotrexate 2.5 mg every 12 hours, two days a week for 6 weeks period. Statistically significant improvement was observed in itching, presence of wheals and sleep quality. Then the dose was increased to 7.5 mg/week.

There was no difference in the extension of lesions and presence of angioedema.

**Conclusion & Recommendations**

Perpetual urticaria (CU) has a wide range of clinical introductions and wheals may happen practically day by day in certain people or it might happen occasionally in others. It might present as backslide few to a little while later after reduction of urticaria.

Treatment of patients with unending idiopathic urticaria includes lessening side effects with least intrusive treatment. The objective of the treatment is to decrease indications until unconstrained goals happens. The underlying administration of constant urticaria ought to be coordinated by the consequences of a full clinical evaluation.

Numerous nonpharmacological and pharmacological mediations are accessible, however none is acknowledged all around. A commonsense way to deal with interminable idiopathic urticaria is dependent on the seriousness of the infection and the patient’s reaction to treatment. Antihistamines are the main line drugs for treating ceaseless idiopathic urticaria. Second-line medications incorporate fundamental corticosteroids, leukotriene rivals, nifedipine, terbutaline, pole cell stabilizer, doxepin, thyroxine and sulfasalazine. Other restorative procedures for troublesome or safe urticaria incorporate including leukotriene opponents, corticosteroids, cyclosporine, methotrexate cyclophosphamide, intravenous immunoglobulin, omalizumab, mycophenolate mofetil, tacrolimus and thin band UVB.

**Discussion**

Methotrexate is frequently used in dermatology is claimed to be deep in chronic urticaria of the idiopathic, steroid dependant types and autoimmune urticaria. It binds extracellularly to dihydrofolatereductase, thereby preventing the conversion of dihydrofolate to tetrahydrofolate. It was thought that this directly inhibited epidermal cell hyperproliferation specifically during the S-phase of mitosis.

It is now believed that the inhibition of folate dependent enzymes such as AICART (5-aminomiazole carboxamideribonucleosidetransformylase), involved in purine synthesis, is the main mechanism of action.
Conclusion

This inhibition leads to intracellular accumulation of AICAR and release of adenosine, which has potent antiinflammatory effects, into the extracellular space. Other potential mechanisms include modulation of adhesion molecules such as ICAM-1.

The most important risk factor for methotrexate toxicity is impaired renal function. Pancytopenia can occur at any time during therapy with methotrexate.

The most important risk factor for methotrexate toxicity is impaired renal function. In this study we found that itching, presence of wheals reduced, no extension of lesions and presence of angioedema. Hence it can be given for all patients with chronic resistant urticaria.

Ethical Clearance - No ethical clearance was necessary for this research work

Source of Funding - Self funded project

Conflict of Interest - Nil

References


A Study of Non Melanoma Skin Cancers Occuring Over the Psoriatic Plaque

Sooky B¹, Jayakar Thomas²
¹Junior Resident, ²Professor, Department of Dermatology, Sree Balaji Medical College & Research Institute

Abstract
This study attempts to find out the incidence of non melanoma skin cancers in psoriasis patients. Psoriasis is a chronic, relapsing, inflammatory and proliferative skin disease associated with cutaneous and systemic diseases.

Patient with psoriasis are at increased risk of developing NMSC (non melanoma skin cancers) and lymphoproliferative disorders.

Keywords: Skin cancer, psoriatic plaque.

Introduction
Psoriasis, a chronic inflammatory and proliferative disorder, associated with numerous cutaneous and systemic disorders. Non melanoma skin cancers (Squamous cell & Basal cell carcinoma) and lymphoproliferative disorders can occur over the plaques of psoriasis. Basal cell carcinoma is a locally invasive epidermal malignant tumor and is the most common skin cancer, accounting for about 68%. Squamous cell carcinoma is an epidermal keratinocyte tumor and accounts for 28% of all skin cancers. BCC is common in males. Females with psoriasis are at high risk for developing SCC¹.

Methodology
A cross sectional study was done with 70 patients diagnosed with vitiligo (all types). All the patients were subjected to

- Complete history
- Complete physical examination
- Skin biopsy

<table>
<thead>
<tr>
<th>Type of NMSC</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQUAMOUS CELL CARCINOMA</td>
<td>2%</td>
</tr>
<tr>
<td>BASAL CELL CARCINOMA</td>
<td>1%</td>
</tr>
</tbody>
</table>

Discussion
The risk of developing carcinoma are high in patients with severe psoriasis and those who are managed with methotrexate, cyclosporine, MMF, biologicals - TNF alpha inhibitors, arsenic, topical tar and PUVA².

In BCC the tumour cells escapes immune recognition and apoptosis by cytotoxic T lymphocytes by

- Failure of tumor cells to express Fas antigen (CD95), hence there is absence of T cell killing by Fas ligand (CD95L),
- Lack of expression of class II MHC antigens on the cell surface,
- Over expression of Bcl-2 (gene products of cell survival),

An abnormal distribution and elevated levels of Protein kinase D, a keratinocyte pro-proliferative signalling enzyme is suggested to precipitate proliferative
disorders such as psoriasis and BCC.

**Extract From Some Studies:**

Patients with severe chronic psoriasis and on systemic therapy should be emphasized the importance of regular follow up and histopathological examination to reduce the development non melanoma skin cancers¹.

In the majority of psoriasis patients managed with PUVA therapy, the initiator of p53 mutations in BCC is due to therapeutic or environmental UV-B exposure and only a small portion by PUVA itself.

**Basic Needs & Importance:**

Squamous cells have lower tolerance for DNA damage & a lower apoptotic threshold, which makes apoptosis a predominant protective mechanism against SCC⁴.

**Conclusion & Recommendations**

Total of 70 patients were included in the study. Out of 70 patients 2% had squamous cell carcinoma arising over psoriatic plaque and 1% has basal cell carcinomas⁵.

Recent studies have shown increased expression of SCC antigen and proliferation regulators like WNT 5A, STAT-1, Defensin B4, Keratin 16, and SERPIN B3 in psoriatic skin compared to normal skin. Biopsy specimen of patient with SCC - shows persistent activation of regulators of keratinocyte growth and differentiation like Src-family tyrosine kinases.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**


A Study on the Patterns of Dermatophyte Infection of Feet

Asha. D¹, Jayakar Thomas²
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Abstract

To study the patterns of dermatophyte infection of feet.

Dermatophytosis is a superficial fungal infection of the keratinized tissue. The causative organisms are called dermatophytes, which have the ability to invade hair, nails, and the skin of the living host.

Infection of feet by a dermatophyte is called tineapedis. Tineapedis is commonly caused by Trichophytonrubrum, Trichophytonmentagrophytes var. interdigitale and Epidermophytonfloccosum.

Keywords: foot infections, skin disorders.

Introduction

Dermatophytosis or ringworm infection are superficial fungal infection caused by keratinophilic fungus belonging to the three genera: Microsporum, Trichophyton and Epidermophyton.

They are classified according to the site of infection as tineacapitis, tineabarbae, tineacorporis, tineacruris, tineapedis, tineamanuum, tineaunguium, tineafaciei, tinea incognito.

Tineapedis or foot ringworm or athlete’s foot is a dermatophyte infection of feet. The common organisms causing tineapedis are Trichophytonrubrum, Trichophytonmentagrophytes var. interdigitale and Epidermophytonfloccosum.

The trichophytonrubrum is the commonest among the three. It is more common in males than females¹.

Methodology

We conducted a cross sectional study of 20 patients diagnosed with Tineapedis attending our Dermatology outpatient department. The recruited patients were subjected to full history taking, thorough general and dermatological examination and investigated for 10% KOH - wet mount and culture.

<table>
<thead>
<tr>
<th>DERMATOPHYTE</th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trichophytonrubrum</td>
<td>16 (80)</td>
</tr>
<tr>
<td>2. Trichophytonmentagrophytes var. interdigitale</td>
<td>3 (15)</td>
</tr>
<tr>
<td>3. Epidermophytonfloccosum</td>
<td>1 (5)</td>
</tr>
</tbody>
</table>

Discussion

The lateral toes are most often affected, particularly in the web space between the fourth and fifth toes, followed by the interspace between the third and fourth toes. The commonest cause is occlusion of toe clefts through wearing shoes, sharing socks, macerated and moist toe clefts, using community bath and swimming pools, humidity, hyperhidrosis, walking barefoot, with history of atopy and immunosuppressive states like diabetes and HIV.

Extract from some studies

The commonest presenting symptom is itching with peeling, maceration and fissuring affecting the lateral toe clefts, and spreading to involve the undersurface of the toes. There are vesicles, pustules which breaks down to form erosion with scaling. The commonest type is the intertriginous dermatitis type. The other types
are chronic papulosquamous, vesicular, acute ulcerative and moccasin foot.

The investigations done are wet mount preparation with 10% KOH from scrapings from the scales and culture with Sabouraud’s dextrose agar culture medium.

**Basic Needs & Importance:**

Tichophytonrubrum shows velvety, red pigment colonies, trichophytonmentagrophytes var. interdigitaleshow white cottony colonies and epidermophytonfloccosum shows yellowish green powdery colonies on culture.

Treatment is by avoidance of the predisposing factors and topical and systemic antifungals.

**Conclusion & Recommendations**

A total of 20 patients were included in our study. The age group was between 15 years to 35 years. 14 males and 6 females with tineapedis were included in our study. The most common type of tineapedis was the intertriginous type. The growth of fungus was confirmed by Wet mount preparation with 10% KOH and the type of fungus were identified by their characteristic growth in Sabouraud’s dextrose agar culture medium. The dermatophyte infection with trichophytonrubrum was seen in 80% patients, 15% with Trichophytonmentagrophyte var. interdigitale, and 5% with epidermophytonfloccosum.

The commonest organism causing tineapedis in our study was Trichophytonrubrum. Preventive measures like changing frequent footwear, drying the feet well after bathing, refraining from sharing articles including socks and community baths are to be followed by patients as these are the commonest predisposing factors for tineapedis.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**

A Comparison on Efficacy of Topical 1% Permethrin and Oral Ivermectin for Pediculosis Capitis

Padam Kumar. M1, Jayakar Thomas2
1Junior Resident, 2Professor, Department of Dermatology, Sree Balaji Medical College and Hospital, Chennai

Abstract

Pediculosis capitis is a common health problem worldwide among school going girls. It is caused by Infestation with the head lice (*Pediculus humanus capitis*).

Topical 1% permethrin is most promising agent used worldwide. Newer agents like oral Ivermectin is also available for the treatment of pediculosis capitis. Here we conducted a study comparing the efficacy of topical permethrin with the oral ivermectin.

Keywords: pediculosis capitis, skin disorders.

Introduction

To compare the efficacy of topical permethrin and oral ivermectin in treatment of pediculosis capitis.

Pediculosis capitis is a common health problem worldwide among school going girls. It is caused by Infestation of the head lice (*Pediculus humanus capitis*). Among available topical treatment modalities, 1% permethrin, a pyrethroid, is the most effective topical agent with few side effects.

It acts by prolonged opening of the voltage gated sodium ion channels on the conduction system of the parasite and resultant palsy.

Thus post application brushing of wet hair with the louse comb helps in removal of head lice1.

Following details were observed.

<table>
<thead>
<tr>
<th>Days after treatment</th>
<th>Clinical Efficacy of 1% Permethrin (symptomatic improvement)</th>
<th>Microbiological Efficacy of 1% Permethrin (cure rate)</th>
<th>Clinical Efficacy of Ivermectin (200 mcg/Kg) (symptomatic improvement)</th>
<th>Microbiological Efficacy of Ivermectin (200 mcg/Kg) (cure rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 7 days</td>
<td>76%</td>
<td>80%</td>
<td>84%</td>
<td>90%</td>
</tr>
<tr>
<td>at 14 days</td>
<td>88%</td>
<td>93%</td>
<td>90%</td>
<td>94%</td>
</tr>
</tbody>
</table>

Methodology

In this quasi-experimental study, a total of 60 patients with head lice were enrolled and randomly divided in 2 groups of 30 each. Topical 1% permethrin application for 1 hour before hair wash and followed by wet combing with a louse comb was advised to one group and oral Ivermectin as 200μg/kg, single dose was advised to the other group.

In both groups, detailed symptomatic clinical history was noted and the examination for nits and head lice were carried out at day 0, 7 and 14. The treatment was repeated at the end of one week. Response to treatment was judged on following parameters: decrease in severity of pruritus, nonappearance of new nits/lice2.

Extract from some case studies/life scenarios:

Corresponding Author:
Dr. Padam Kumar. M,
Junior Resident, Department of Dermatology, Sree Balaji Medical College and Hospital, Chennai.
Basic Needs & Importance

Application has to be repeated after a week so as the nits turns into the adult lice. High incidence of resistance to permethrin is reported. Ivermectin is an orally available drug for various parasitic infections and also for Pediculosis capitis. It is effective, inexpensive and easy to administer with no known drug interactions and limited side effects.

It acts primarily at the Glutamate-gated chloride ion channels and secondarily at the γ-aminobutyric acid-gated chloride ion channels.  

Discussion

The most frequent presentation of pediculosis is pruritus; other common manifestations include excoriations, cervical lymphadenopathy, and rarely blepharitis and conjunctivitis. Beyond physical manifestations, there are negative social effects and potential economic effects on households.

In our study we found that topical permethrin is less efficacious compared to the oral Ivermectin at the end of one week after single treatment. But on second treatment with a gap of 1 week. Both were equally efficacious clinically and microbiologically in control of head lice infestation.

Conclusion & Recommendations

There is no significant difference regarding efficacy of topical permethrin and oral ivermectin both clinically and microbiologically, when used in treatment of pediculosis capitis, provided they are used correctly and are repeated at the end of one week. A combination treatment would possibly bring a higher cure rates.

Ethical Clearance - No ethical clearance was necessary for this research work

Source of Funding - Self funded project

Conflict of Interest - Nil

References

Incidence of Scabies among Family Members in an Urban Setup

Padam Kumar. M¹, Jayakar Thomas²
¹Junior Resident, ²Professor, Department of Dermatology, Sree Balaji Medical College & Research Institute

Abstract

To screen the close contacts and the family members of patients clinically diagnosed with scabies. Scabies is a common ectoparasitic infection caused by Sarcoptes scabiei var hominis. It more commonly occurs in rural areas and its exact incidence in urban setup been unknown.

This study has been undertaken to highlight the importance of screening and treating the close contacts and the family members of scabies.

Keywords: scabies, urban setup.

Introduction

Scabies is a common parasitic infection caused by the itch mite Sarcoptes scabiei var hominis, an arthropod of the order Acarina. Scabies happens in both genders, at all ages, in every single ethnic gathering, and at all financial levels. Scabies is a parasitic skin illness endemic in asset poor networks in low-salary nations. It is prevalent higher in numbers in a rural setup among close contacts due to lack of sanitation and over crowing. Its frequency of occurrence among close family members in urban areas is unknown. Scabies was demonstrated to be progressively predominant among ladies and youngsters and more typical in winter than in summer. Scabies is commonly a disturbance by virtue of extraordinary night time tingling, rash, and its capacity to spread among individuals; superinfection may likewise happen.

Methodology

Consenting 450 Family members of 100 cases of scabies diagnosed clinically were screened for the evidence of scabies based on symptomatic clinical history and thorough clinical examination. Scrapings for wet mount examination were also taken in doubt to confirm the diagnosis. All the index cases and their contacts with the evidence of scabies were treated with topical 5% Permethrin cream. The study was conducted in a tertiary care center in an urban area.

![Fig. 1: Age wise distribution of Family contacts to scabies.](image1)

![Fig. 2: Sex wise distribution of Family contacts to scabies.](image2)
Discussion

The analysis of scabies lays to a great extent on the history and clinical examination of the patient, just as on the clinical history of the family and the nearby contacts. Exemplary appearances of scabies incorporate summed up and serious tingling, normally saving the head and face. Pruritus is more awful around evening time. The sores are found generally in the finger networks, on the flexor surfaces of the wrists, on the elbows, in the axillae, on the bottom and genitalia, and on the bosoms of ladies. Incendiary pruritic papules are available at generally sites. Tunnels and knobs (for the most part in the genital locales and axillae) are explicit creators of scabies yet now and again might be missing.

Extract from some studies

Numerous medications are available for treatment such as 5% permethrin, Ivermectin (200 mcg/Kg), Lindane, Malathion, Crotamiton, Benzyl benzoate, and the Precipitated sulfur.

Basic Needs & Importance

Nearly 450 family members of the index case of scabies screened, 180 close contacts were diagnosed to have scabies (40%), children of age less than 20 years and adults above the age of 61 years were more often affected (30% each category), compared to the family members of age 21 and 60 years.

Conclusion & Recommendations

Thus a higher incidence of scabies is prevalent in the society as compared to the presenting cases to the hospital. The need to screen and treat the close contacts or the family members is of utmost importance to keep the endemicity of the ectoparasite.

100 cases of scabies had 450 family members. Children less than 20 years and adults above 61 years were more often affected. 62% of Females and 38% of males were affected. The age wise distribution and sex wise distribution is given in Fig. 1 and Fig. 2 respectively. Prevalence of scabies among close contacts was 40%.

Treatment of close family members or close contacts of scabies is of utmost importance due to higher prevalence rates of infection among them even in urban setup.

Ethical Clearance - No ethical clearance was necessary for this research work

Source of Funding - Self funded project

Conflict of Interest - Nil

References

Role of Focal Infections in Urticaria

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Abstract

To contemplate the rate of central diseases in patients with urticaria, who are going to the skin outpatient division. Urticaria comprises a gathering of sicknesses that offer an unmistakable skin response design. Diseases, as a trigger for urticaria has been talked about for a long time yet at the same time the accurate job and pathogenesis of pole cell actuation by irresistible procedures is hazy.

In unconstrained intense urticaria, there is no uncertainty for a regular relationship to contaminations. While in physical or contact urticaria, the proof for contaminations is peaceful less and the reduction of unconstrained interminable urticaria has been accounted for after effective treatment of industrious diseases.

Keywords: focal infections, urticaria.

Introduction

The relationship among urticaria and overpowering diseases has been talked about for >100 years.

In any case, a causal association with head or surging sickness is hard to set up. The reason behind this work was to play out a purposeful examination of the passed on events of urticaria related with bacterial defilements.

We give an umbrella breakdown of bleeding edge careful investigations and other significant manifestations on the abnormal relationship of urticaria and bacterial ailments. We completed a Medline search, for English language articles spread until January 2014, utilizing the watchwords ‘urticaria’ and ‘microorganisms/bacterial sickness’; a subsequent examination was performed in get-togethers of little living creatures and utilizing every germ name as a catchphrase.

The annihilation of the debasement could, in all honesty, brief the destinations of urticaria. Exceptional examinations and proficient research are undeniably expected to even more plausible explain the genuine control of life forms in the pathogenesis of urticaria and their relative power.

Methodology

A cross sectional study was done with 30 patients who were diagnosed with urticaria (all types). All the patients were subjected to

- Complete history taking
- Complete physical examination
- Dental and ENT examination

<table>
<thead>
<tr>
<th>Focus Of Infection</th>
<th>Number of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental foci</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Upper respiratory tract</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Urogenital tract</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>No foci</td>
<td>10</td>
<td>33</td>
</tr>
</tbody>
</table>

Extract From Some Other Studies:

Different bacterial debasements have been associated with urticaria sign, for example, Helicobacter pylori, Streptococcus, Staphylococcus, Mycoplasma pneumonia, Salmonella, Brucella, Mycobacterium leprae, Borrelia, Chlamydia pneumonia, and Yersinia enterocolitica.

Every so often the skin appearances, portrayed as urticaria, could be acknowledged by the nearness
of the microorganism in the skin, or for the activity of their dangerous substances, or to the enhancement authorization mediated by surrounding safe structures.

**Discussion**

Urticaria is described by the event of irritated wheals anywhere on the skin. Wheals are brief raised erythematous injuries going in size from a couple of millimeters to centimeters in width and can wind up blended. The tingling can be consuming or pricking and is commonly more terrible at night or evening time related with rest unsettling influences.³

**Basic Needs & Importance:**

The devastation of the sullying could, in all honesty, lead to the objectives of urticaria. Impending examinations and efficient research are plainly expected to all the more probable clarify the certified activity of microorganisms in the pathogenesis of urticaria and their relative power.⁴

**Conclusion & Discussions**

Out of 30 patients examined, 12 patients (40%) had dental focus of infection, 6 patients (20%) had upper respiratory tract infection and 2 patients (7%) had urogenital tract infection. 10 patients (33%) did not have any evidence of focal infection. A high incidence of focal infections, were found in patients with urticaria. This suggests that infections may play a significant role in pathogenesis of this skin disorder. Treatment of infective foci may play a significant role in the remission of the disease process.

**Ethical Clearance:** No ethical clearance was necessary for this research work

**Source of Funding:** Self funded project

**Conflict of Interest:** Nil

**References**

Use of Social Networking Sites and Depression among Medical Students

Arkaprava Chakraborty\(^1\), R. Uma Devi\(^2\), S. Gopalakrishnan\(^3\)
\(^1\)Student, \(^2\)Professor, \(^3\)Professor & Head of the Department. Department of Community Medicine, Sree Balaji Medical College and Hospital, Chennai

Abstract

Social networking sites (SNS’s) offer a straight forward way to converse among people and sustain relationships among them. For the past decade, there is a huge change in the field of communication because of the rapid development of social networks.

The purpose of the study was to identify the impacts of Social Networking Sites (SNS’s) on the medical students and to ascertain the reasons behind using social media.

This cross-sectional study was carried out on 100 undergraduate medical students in Sree Balaji Medical and Hospital, Kanchipuram (dist.), Tamil Nadu. A self-administered questionnaire designed for the study was distributed among the students.

Of the 100 students, majority belongs in 20-22 years age group (63%) and 38% spend 1-3 hours per day mostly to keep in touch with friends and family (85%). Three participants were found to have moderately severe depression whereas 40% were having minimal depression and 31% were having mild depression.

Internet addiction has become a major problem for medical students. Students should be counseled about the merits and demerits of internet addiction. Duration of internet use must be restricted by parents and authorities to avoid the increasing risk of internet addiction which ultimately leads to depression.

Keywords: Social Media, Internet Addiction, Medical Undergraduates.

Introduction

Social networking sites (SNS’s) can be defined as “a group of Internet-based applications that allow the creation and exchange of user-generated content.” For the past decade, there is a huge change in the field of communication because of the rapid development of social networks.\(^1\) Use of internet has increasingly influenced all aspects of society and the exponential rise of the global users. There is an escalating number of people that spend their time chatting and browsing the social networking sites. It indicates that it has become an integral part of the daily lives of people of modern era.\(^2\)

Social media networks offer a straightforward way to converse with peers and get peer feedback, as well, which may influence a young adult’s self-esteem. By using Facebook, Whatsapp, Instagram, etc communicate with multiple people at one time is very easy nowadays. Social media may also make it easier for users to monitor activities of people they have not seen in a while as well as reconnecting with new and old friends.\(^3\)

Internet use is growing in leaps and bounds in India. According to internet and mobile association of India, approximate number of urban active internet users was 42 million in 2008 compared to 5 million in 2000. With approximately 120 million internet users in 2011, India now ranks third regarding the size of digital population in the world. The number of internet users in India has grown five fold since 2005.\(^4\)

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Easy access and social networking are two major factors of addicting behavior among young adults. Internet Addiction Disorder (IAD) causes neurological complications, psychological disturbance and social problems. Surveys in the United States and Europe found high prevalence rates between 1.5% and 8.2% respectively. Therefore, it is very important to establish the relationship between the use of social networking sites and depression.

**Materials and Method**

This cross-sectional study was carried out in Sree Balaji Medical College and Hospital, Kanchipuram (dist.), Tamil Nadu, India, from April to June, 2019. The study population comprises of 100 undergraduate medical college students and interns. The study was carried out after obtaining institutional ethical clearance. A self-administered questionnaire designed for the study was distributed among the students who were present at the time of administration of questionnaire.

Questions regarding number of accounts in social networking sites, gadgets used, login status, average time spend on Internet, usual time for Internet use, purpose of use of social media, etc were enquired. It also contained Patient Health Questionnaire (PHQ). The PHQ consists of 9 questions to evaluate the respondent’s level of depression. Each of the questions was scored according to the options given. The minimum score is 0 and maximum score is 3. At the end, all scores are added to find out the total score and categorised individuals as minimal, mild, moderate, moderately severe, severe depression.

Verbal consent was taken before administering the questionnaire. They were told that the data being collected were anonymous, confidential and for research purpose only and that their participation was voluntary. Data analysis was done, where categorical variables were summarized by frequencies and percentages.

**Results**

Among the 100 participants, majority belonged to the 20-22 years age group (63%) and 56 were female students. About 61% were residing at their college hostel only [Table: 1]. The participants having 5+ social networking accounts are 35% and almost all of them (99%) use mobile as common gadget to access SNS’s. [Fig: 1 and Table: 2]
Around 64% participants use social media during evening and 38% spend 1-3 hours per day. Around 45% people post every few months, 21% post every few weeks and only 6% post daily on social media. [Fig: 2 and Table: 3]

**Fig 2.** – Usual time of the day for internet use.

**Table: 3 – Pattern of use of social networking sites.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time spend in social networking per day</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 30mins</td>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td>30-60mins</td>
<td>18</td>
<td>18%</td>
</tr>
<tr>
<td>1-3hrs</td>
<td>38</td>
<td>38%</td>
</tr>
<tr>
<td>3-6hrs</td>
<td>25</td>
<td>25%</td>
</tr>
<tr>
<td>6-8hrs</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td>8hrs +</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Post on social media</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>11</td>
<td>11%</td>
</tr>
<tr>
<td>Every few months</td>
<td>45</td>
<td>45%</td>
</tr>
<tr>
<td>Every few weeks</td>
<td>21</td>
<td>21%</td>
</tr>
<tr>
<td>Weekly</td>
<td>12</td>
<td>12%</td>
</tr>
<tr>
<td>Daily</td>
<td>6</td>
<td>6%</td>
</tr>
<tr>
<td>Multiple times in a day</td>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Check social media before getting out of bed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>46</td>
<td>46%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>47</td>
<td>47%</td>
</tr>
<tr>
<td>Never</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td>Can’t recall</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
The main purpose of using social media is to keep in touch with friends and family (85%). [Fig:3]

According to PHQ 9 depression scale (Patient Health Questionnaire), it was found that 40% of the total respondents were having minimal depression and 31% were having mild depression while three students were found to be moderately severe depressed. [Table: 4]
Table: 4– Distribution of students according to the depression scale.

<table>
<thead>
<tr>
<th>Depression Scale</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Depression</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>Minimal Depression</td>
<td>40</td>
<td>40%</td>
</tr>
<tr>
<td>Mild Depression</td>
<td>31</td>
<td>31%</td>
</tr>
<tr>
<td>Moderate Depression</td>
<td>16</td>
<td>16%</td>
</tr>
<tr>
<td>Moderately Severe</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Depression</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Discussion

Social networking is important for medical students for their future contacts among themselves. Nowadays, many social networking sites are available around the globe and medical students are now using different types of media according to their status of life to spend their time. Thus, social networking sites have completely changed the way that adolescents interact and gather information.1

In this study, majority of 99% participants access SNS’s using mobile. Around 75.5% access SNS’S through smartphone in a study conducted by Medha R, Sharmistha B, Abhijit M. With the advent of newer technology, smartphones have become the preferred device for SNS’s use, mainly due to their portability.5 Smartphones are ubiquitous with their user-friendly interfaces and advanced computing capabilities.6

In also shows that around 64% participant’s uses internet during evening while 61% uses internet at night. Whereas, 38.06% participants uses internet during evening and majority of 49.03% preferred using internet at night in a study conducted by Santanu G, Supantha C.4

Around 18% uses SNS’s for 30-60mins, 25% uses SNS’s for 3-6hrs and 38% uses SNS’s for 1-3hrs. Hence, duration wise, around 86% students reported to use SNS’s for >6hrs while 53% participants log in and off occasionally during the day. On the other hand, 80% students reported to use SNS’s for >4hrs and two-third of the participants remain log in and off occasionally during the day in a study conducted by Lisa B, Dipta KM, Gautam KB.3

In the present study, 40% of the total respondents were having minimal depression, 31% having mild depression, 16% having moderate depression and only 3% were suffering from moderately severe depression. Around 90% of participants reported depression of various grade in this study while Kulsoom et al. reported a high prevalence of depression (43%) among the participants and Yusoff et al. noted very low prevalence of depression.2

A total of 49% students face trouble concentrating on studies on several days of the week. A study among college students of Oman showed that 36% of the participants felt that spending time on SNS’s had distracted as well as affected their study timings.7

In summary, the present study shows significant association of high usage of social media with depression among medical students in Sree Balaji Medical College and Hospital, Kanchipuram(dist.), in the present socio-cultural context.

Conclusion

The present study revealed that a large proportion of medical undergraduates have an affinity towards using SNS’s. Although majority of students use SNS’s for various purposes but using SNS’s in odd hours leads to depression. In this modern era, using internet is a necessary part for medical education but it is the duty of the medical college authorities as well as the guardians of the students to check that use of internet should not be in an improper way. A regular check by the guardians as well as by the college authorities regarding the misuse of internet is very helpful. Medical undergraduates must be encouraged to use internet for research work and creative purposes. Awareness among the students about the demerits of prolonged internet use both from health and social point of view should be highlighted by the college authorities via organizing workshops, debates and seminars and prevent students from getting addicted to internet. Thus, we all should be aware of the knowledge that the advantages of internet must not be lagging behind the unhealthy use of internet and its addiction.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest - Nil
References


Study on the Awareness of Breast Cancer and Prevalence of Breast Self-Examination among Urban Women in Chennai

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Abstract

Background: Breast cancer is currently the most common cancer occurring in Indian women. In India, one woman is diagnosed with breast cancer every 4 minutes and one woman dies of breast cancer every 8 minutes. The age standardised rate is approximately 25.8 per one lakh women and is expected to rise to 35 per one lakh women in 2026. Approximately 60% of patients with breast cancers are diagnosed in advanced stages. The aim of this study is to assess the knowledge of breast cancer and the practice of breast self-examination among urban women.

Method: This is a cross-sectional research study carried out in Valasaravakkam locality in Chennai. A pre-tested, semi-structured questionnaire was used which contains socio-demographic details, and questions about risk factors of breast cancer, practice of breast self-examination and mammography. The data was collected through interview after obtaining informed consent from the subjects.

Result: Responses were collected from 100 women within the age group of 18-55. A little more than 90% of the women have heard of breast cancer. Media and Educational Institutions play a key role in expanding the awareness of breast cancer. Most women identified family history as a cause and a lump in the breast as a sign of breast cancer. 68% of women have heard of breast self-examination but only 40% of them practice it. 66% of the women knew about mammography, and 10% women have had a mammography done before.

Conclusion: This study concluded that the awareness of the breast cancer was good but the knowledge and practice of breast self-examination was poor, which is vital for the early detection and treatment of breast cancer.

Keywords: Mammography, Risk factors, Signs

Introduction

Cancer is one of the deadliest diseases in the world and holds second position in being the cause of most number of deaths across the globe. As of 2018, cancer has been estimated to have led to about 9.6 million deaths worldwide¹. Breast cancer is the most common form of cancer occurring in women and is the second most common cancer globally, closely following Lung cancer.

It affects both sexes of developed as well as developing countries, but 100 times more common in females than males. Breast cancer constitutes to 12.3% of all cancers and an estimated 20,88,849 new cases were diagnosed in 2018². In India, the incidence of breast cancer is up to 30.9 per 1,00,000 women³. 1,62,468 new cases and 87,090 deaths due to breast cancer were reported in India in 2018⁴.

Some of the recognized risk factors of breast cancer include the following – Age, ethnicity, personal and family history - women who have previously suffered from breast cancer have a risk of recurrence and it has been estimated that 8 out of 10 women battling breast cancer...
cancer do not have a family history, but about 5% to 10% of the cases are assumed to have occurred as a result of mutation in the BRCA1 and BRCA2 genes which are inherited from parents. Early menarche (before 12 years) and late menopause (after 55 years) are also risk factors for development of breast cancer as it provides longer periods of exposure to hormones oestrogen and progesterone.

Combination Hormone Replacement Therapy (HRT) increases the risk of breast cancer by about 75% even when used for 2-3 years, whereas the oestrogen only HRT increases breast cancer risk only when used for more than 10 years. Dietary habits like excessive consumption of alcohol added sugars, fat from processed foods and red meat increase the risk while foods rich in fibre, low fat milk and dairy products, colourful fruits and vegetables, foods rich in vitamin D and Soy reduce the risk of breast cancer. Smoking, obesity, socio-economic status, radiation to chest and increased use of oral contraceptives are also said to increase the risk of breast cancer. Women previously diagnosed with certain benign conditions of the breast like Fibroadenoma, Fibrosis, Ductal hyperplasia and many others are at a risk of developing breast cancer.

The most suitable economical method to combat breast cancer is the prevention of cancer itself. Primary prevention of the cancer can be initiated by reducing the risk factors through widespread promotion of cancer education among the general population so as to help women identify the risks, signs and symptoms of breast cancer. Early detection of breast cancer and the removal of tumour in its early stages influences the survival of the patient. Clinical Breast Examination and Mammography have proved to be useful screening tests for the early detection of breast cancer but feasibility poses a bigger issue. According to the American Cancer Society’s guidelines for women at average risk of breast cancer aged 40-44, yearly Mammography is optional and women aged 45-54 should get Mammography done every year and women older than 55 can get Mammography done yearly or every alternate year.

Breast self-examination is an easy, economically feasible, non-invasive screening method that can be practised by women for routine examination of their breasts and early detection of breast cancer. Although the efficacy of breast self-examination has not been determined, it helps establish the importance of breast health among women. Breast self-examination is encouraged from 18 years of age and is to be done every month, 3-5 days after the onset of menstrual cycle as the breasts are not as tender or as lumpy during this time of the cycle.

Post-menopausal women can perform breast self-examination on the same day of every month. Some of the changes suggestive of breast cancer that can be noted during breast self-examination are change in the position or shape or size of nipples, drawing in of nipples, any bleeding or abnormal discharge of fluid from nipples, change in the size of breasts, change in the appearance of skin over breasts, pain in the breasts or under the armpits and lumps in breasts or under the armpits.

This study aims to assess the knowledge and awareness of breast cancer and the extent of practice of breast self-examination among urban women.

Materials and Method

This is a cross-sectional research study carried out in Valasaravakkam locality in Chennai. The study subjects included 100 women aged between 18-55 years. The sampling method was convenient sampling technique. The period of study was from April 2019 to July 2019. This study was approved by the Ethical Committee of the Institute. A pre-tested, semi-structured questionnaire was used which contains socio-demographic details, and questions about risk factors of breast cancer, practice of breast self-examination and mammography. The data was collected through interview after obtaining informed consent from the subjects and was analysed using Microsoft Excel and the results are represented as charts and tables.

Results

100 female subjects aged between 18-55 years took part in the study. Almost all the subjects were literate. About 91% of them had heard of breast cancer.

Source of information - Half of them conceded media (TV, Radio, Internet) and Educational Institutions to be the source of their awareness on breast cancer. Other sources include Family/Friends and Hospital staff (Doctors, Nurses). Figure 1, 2 and 3 depicts the awareness of women on risk factors, preventive measures and important signs suggesting breast cancer.
Figure. 1: Awareness of risk factors of breast cancer (multiple responses were analysed)

![Bar chart showing awareness of risk factors of breast cancer]

Figure. 2: Awareness of factors preventive against breast cancer (multiple responses were analysed)

![Bar chart showing awareness of factors preventive against breast cancer]
Clinical screening for breast cancer - Of the 100 women, 8% have undergone clinical screening for breast cancer while the remaining 92% have not. 77 of the 92 women who didn’t go for a clinical screening responded that they didn’t feel the requirement for it. 4 of them were unaware, 4 felt too embarrassed to see a doctor, 3 claimed to be too busy to visit a doctor, 2 were too scared to visit a doctor and 2 felt that visiting a doctor is too expensive.

Table 1: Awareness and practice of Breast Self-Examination (n=100)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Aware of BSE</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>68</td>
</tr>
<tr>
<td>No</td>
<td>32</td>
</tr>
<tr>
<td>2. Taught to perform BSE</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>47</td>
</tr>
<tr>
<td>No</td>
<td>53</td>
</tr>
<tr>
<td>3. Practice BSE</td>
<td></td>
</tr>
<tr>
<td>Yes, with no positive family history</td>
<td>35</td>
</tr>
<tr>
<td>Yes, with positive family history</td>
<td>5</td>
</tr>
<tr>
<td>No</td>
<td>60</td>
</tr>
</tbody>
</table>

Of the 40% who practiced BSE - 19 did it occasionally, 11 performed rarely, 6 practiced every month, and 4 did it every week. 36% said BSE should be started from 30 years of age, 31% said from 18 years of age, 21% said from puberty, and 12% said after menopause. When questioned about the ideal regularity to practice BSE, 52% chose monthly, 19% chose weekly, 19% chose yearly and 10% chose rarely.

Mammography - 66% have heard of mammography and 10% have had a mammography done before. 33% said mammography should be done only when an abnormality is found upon BSE, 21% said yearly, 6% said occasionally, 5% said monthly, 1% said weekly and 34% didn’t know about it.

Discussion

The data analysis of the study has shown that most of the women identified family history as a risk factor for breast cancer. Three-fifth of the subjects feel that regular practice of breast self-examination and breastfeeding can be preventive against breast cancer. The signs of breast cancer that were chosen by more than half of the participants were lump in breast, abnormal discharge from nipple, pain and change in shape or size of breasts. The recognition of signs of breast cancer is fundamental.
in its early detection as it affects the treatment and improves chances of survival. It is important for women to learn about the various risk factors that lead to breast cancer.

This study revealed that most of the study population was aware of breast cancer and breast self-examination. However, their knowledge and practice of BSE and history of clinical screening is deficient. In a study done by Deniz et al., 49% of the women did not perform BSE and 67.2% had never had a clinical screening done.

The sizeable number of the women who haven’t undergone a clinical screening previously throws light on the lack of importance given to breast health screening. Most of them believed that it was unnecessary as they felt that they were too young to undergo screening for the disease. These findings were found to be consistent with that of a national survey.

This survey uncovered that more than half of the total study population didn’t know how to perform a self-examination. Almost an equal percentage of them were unaware of the right age at which regular examination, clinical screening and mammography should be done. About half of them were aware about the ideally required regularity for practice of BSE. A similar study by Madhukumar et al. stated that only 18% of the women knew about BSE.

Breast cancer is a major global health concern as it is one of the top three cancer types plaguing the human populace in terms of incidence and mortality. According to the GLOBOCAN 2018 database released by the International Agency for Research on Cancer (IARC), breast cancer is the fifth leading cause of death – responsible for about 6,27,000 deaths which accounts to 6.6% of the total number of deaths. Public health records point that the overall burden of breast cancer in women is extensive and on the rise because the incidence rate is far higher than any other cancer in both developed and developing countries. Breast cancer is the most commonly diagnosed cancer in women – 24.2% of the total cases, that is, about 1 in 4 of all the new cases diagnosed in women worldwide are breast cancer and it is the most commonly occurring type of cancer in 154 of the 185 countries included in GLOBOCAN 2018.

Every year, the incidence and mortality rate continues to increase as most cases are diagnosed only in the advanced stages. The inhibitions with respect to talks about breast health should be cleared by a strong emphasis on the weight of the issue and encouraging women to be more open about it.

**Conclusion**

This study concluded that the awareness of breast cancer in this study population is good. On the other hand, their knowledge and practice of BSE is lacking. Women should be educated about the importance of a healthy lifestyle and reproductive history in the battle against breast cancer.

Enlightening them about the modifiable risk factors like diet, exercise, alcohol consumption, etc., may improve the chances of preventing breast cancer by inspiring them to assume better habits. In India, discussions on breast cancer are highly impeded due to cultural restrictions or taboos.

Women feel too shy or too embarrassed to consult a doctor on matters concerning their breast health.

Media and educational institutions have played a critical role in spreading the awareness of breast cancer. Breast health education and training in BSE should be imparted at school and college levels. Nation-wide cancer awareness campaigns and community-level health care organisations should be implemented in both urban and rural areas to reach out to a larger population. Women should also be explained about the various modes of treatment, management of breast cancer available across the country and the chances of survival and recovery.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**


Staphylococcal Scalded Skin Syndrome- A Casereport

Swathy Asokan¹, Anantha Eashwar², S.Gopalakrishnan³
¹UG Student, ²,³PROFESSOR, Dept of Community medicine, SBMCH, ch-44

Abstract

Staphylococcal scalded skin syndrome [SSSS] or Ritter’s disease is a vesiculating skin disease most commonly caused by Staphylococcus aureus, a gram positive commensal which asymptomatically colonizes the skin. Rarely, few strains cause SSSS. A study in the Czech Republic showed an incidence of approximately 25 cases per 100,000 children younger than one year of age. It can occur in outbreaks, particularly in nurseries. It is far less common in adults. When they do occur, cases in adults typically involve those with immunosuppression such as HIV/AIDS, severe renal impairment or renal failure, or in those withmalignancy.

Keywords: Ritter’s disease, exfoliative toxins, desmolglein, nikolsky sign

Introduction

Staphylococcal scalded skin syndrome [SSSS] or Ritter’s disease is a vesiculating skin disease caused by the bacteria Staphylococcus aureus phage group 2 strains 55 and 71, most commonly seen in children below 5 years of age. There is generalized erythema of the skin with blisters, and scales are seen in the later stages. Areas prone to movement, flexural areas, are most commonly initially involved. In children, the perioral area, eyes and ears, in infants, the diaper area and the area around the bellybutton are most often affected. The rash spreads rapidly with a propensity to affect the perioral area and areas where the skin creases, especially on the legs, arms, groin and neck. The top layer of the epidermis detaches from the underlying layers resulting in loose blisters and shallow erosions. Affected skin may slough off in sheets. Sloughing results in the exposure of moist, reddish tissue very close to the top of the epidermis and gives the skin a scalded or burned appearance. The application of gentle pressure to the skin will cause sloughing which is known as a Nikolsky sign, and it is imperative for the diagnosis of SSSS. These manifestations are due to the production of exfoliative toxins produced by the bacteria which takes a hematogenous route of spread and binds to a target protein in the superficial layers of the epidermis. It has many differential diagnoses like Toxic epidermal necrolysis, epidermolysis bullosa, Stevens-Johnson syndrome etc. Due to high morbidity and many differential diagnoses with different treatments, timely diagnosis is very critical.

Methodology

Condition During Admission:

A 3 year 3 months old male child presented on 26/03/2019 with complaints of painful vesiculobullous lesions and low grade fever for one day. The lesions developed following scratching of the skin and worsened drastically in the next 24 hours. The child was looking sick, toxic and irritable. There was history of itching, no history of any drug intake, burning micturition or bowel and bladder symptoms. He had a previous history of nebulisation.

On examination, the child was conscious and alert. His height and weight measurements were done and were found to be 93cm and 11.9kg respectively. His temperature was 102°F, pulse rate 160/min and respiratory rate 32/min. Oxygen saturation and hydration were normal. On general examination, all entities were normal. ENT was normal and there was watering from the eyes. CVS examination showed normal S1, S2 and no...
murmur. On RS examination bilateral air entry was equal with no added sounds. Abdomen was found to be soft on palpation, organomegaly and tenderness were absent. There was no neurological deficit seen. On examination of the skin and mucous membranes, it was found that mucous membranes were spared while the skin showed erythematous, vesiculobullous/ impetigenous lesions in the perioral area, axillae and the groin with a positive nikolskysign.

INVESTIGATIONS

<table>
<thead>
<tr>
<th>COMPLETE BLOOD CELL COUNT (CBC)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin (Hb)</td>
<td>13.5 g/dl</td>
</tr>
<tr>
<td>PCV</td>
<td>41%</td>
</tr>
<tr>
<td>RBC</td>
<td>5.4 million/mm³</td>
</tr>
<tr>
<td>Total WBC count</td>
<td>11800 cells/mm³</td>
</tr>
<tr>
<td>Polymorphs</td>
<td>80%</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>14%</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>01%</td>
</tr>
<tr>
<td>Monocytes</td>
<td>05%</td>
</tr>
<tr>
<td>ESR</td>
<td>12mm</td>
</tr>
<tr>
<td>Platelets</td>
<td>3.3 lakhs/mm³</td>
</tr>
<tr>
<td>MCV</td>
<td>75 fl</td>
</tr>
<tr>
<td>MCH</td>
<td>24 pg</td>
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<tr>
<td>MCHC</td>
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<table>
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<tr>
<th>RENAL FUNCTION TEST</th>
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<tbody>
<tr>
<td>Urea</td>
<td>19 mg/dl</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.3 mg/dl</td>
</tr>
<tr>
<td>Sodium</td>
<td>135 mEq/L</td>
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<tr>
<td>Potassium</td>
<td>4.5 mEq/L</td>
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<tr>
<td>Chloride</td>
<td>99 mEq/L</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>23 mEq/L</td>
</tr>
<tr>
<td>Calcium</td>
<td>9.9 mEq/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER INVESTIGATIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CRP</td>
<td>1.0 mg/L</td>
</tr>
<tr>
<td>Blood culture and sensitivity</td>
<td>No growth</td>
</tr>
<tr>
<td>Blister fluid: Gram stain Culture and sensitivity</td>
<td>No organisms seen No growth</td>
</tr>
<tr>
<td>Blood grouping and typing</td>
<td>A+ve</td>
</tr>
</tbody>
</table>

SSSS is a clinical diagnosis and lab diagnosis is only for completion sake. His blood investigations showed leucocytosis and there was a negative CRP. His preliminary blood culture was sterile.

TREATMENT:

After taking the dermatologist’s opinion, he was treated with IV fluids, IV antibiotics and other supportive measures.

IV fluids:
0.9% GNS
Antibiotics:
Inj. Augmentin given for 3days
Inj. Amikacin given for 3days Supportive measures:
Syp. Augmentin
Syp. Atarax
Syp. Malidens
Tab. Montair5
Application of liquid paraffin on the affected areas

CONDITION DURING DISCHARGE:

He improved with the above treatment, so he was discharged with oral medication. He was conscious, oriented and afebrile with stable vitals at the time of discharge.

Drugs advised at discharge:
Syp. Augmentin Duo 6ml BD 1-0-1*4days
Syp. Flora BC 5ml BD 1-0-1*3days
Syp. Atarax 4ml TDS*3days

Discussion

SSSS, a rare skin condition which primarily affects children, was first described by a German physician, Von Rittershain, in 1878. The exfoliative toxins, type A and B (ETA and ETB), produced by the bacteria, cleave desmoglein complex 1. Disintegration of desmosomes anchoring the stratum granulosum causes exfoliation⁴. As stated previously, not all phage types of staph is associated with Ritter’s disease. Since this disease is a
manifestation of the toxin produced by the bacteria and not the bacteria itself, the culture will be negative here.

SSSS can mimic other exfoliating diseases such as Toxic epidermal necrolysis (TEN) and Steven Johnson syndrome (SJS). Lack of mucosal involvement, target lesion and history of any recent drug intake differentiates SSSS from SJS and TEN. For now, diagnosis is only reached by exclusion and specific techniques to detect the particular toxin, such as polymerised chain reaction (PCR) are not readily available in some clinical settings[5].

This condition causes severe morbidity and mortality, if not treated properly. The mortality rate in adults is as high as 60% and in children it is 4%. Complications of SSSS include pneumonia, dehydration and sepsis, although the last one is relatively rare. Electrolyte and fluid management is important as dehydration can lead to electrolyte imbalances[5].

In this case, a prompt diagnosis of SSSS and treatment resulted in rapid healing and timely discharge. The classical presentation of the disease with painful, erythematous vesiculobullous lesions mainly in the perioral and flexural areas with a positive nikolsky sign facilitated in reaching a quicker diagnosis. Thus there were no complications or later complaints reported.

**Ethical Clearance**- No ethical clearance was necessary for this research work

**Source of Funding**- Self funded project

**Conflict of Interest** - Nil

**References**

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Epidemics and Pandemics in India throughout History: A Review Article

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Abstract

India has encountered several epidemics and pandemics throughout history. This review article talks about such outbreaks known to have occurred in the 19th-21st century and are arranged in accordance to chronology. For this review, a variety of sources were used by searching through PubMed, NCBI and several others. Different forms of prints such as books, websites, and journals were used as references in this article. The necessity to review this title is because the information is scattered and to source them and compile them into a single article could help the medical practitioners and healthcare workers to understand what this country has been through in the past and what reforms have to be made by them, the community and the government in preventing such outbreaks in the future.

Keywords: epidemics, skin deficiencies

Introduction

India, being a third-world country, has encountered a variety of epidemics and pandemics through time. Several accounts of influenza, cholera, dengue, smallpox and several others have been recorded throughout history; while we have been able to eradicate some; many diseases still continue to pose a threat to the community. It is not uncommon for sudden and rapid outbreaks to occur in India and many articles direct the cause for this in such developing countries being malnutrition, lack of sanitation and lack of a proper public health system [1,2]. According to Park, epidemics is an unusual occurrence in a community or region of disease, specific health-related behavior or other health-related events clearly in excess of expected occurrence. It is a sudden, severe widespread outbreak of a disease pre-existing in the community. A study by John T. Watson, et all analyses the relationship between epidemics and natural disasters and establishes that there is a rise in the occurrence of epidemics post-disaster though incidence in India has not been emphasized [3]. However, another article by Sen states those in recent years, cholera outbreaks in India have been due to the breakdown of sanitation during natural disasters [4]. A study by Moore, Cristopher, and Mark displays that the epidemic trends modify when the transmission exceeds the threshold station the infectious nature of it [5]. Pandemics, on the other hand, refer to the worldwide spread of diseases. These are the global health problems that need to be addressed and treated viciously along with proper measures to avoid transmission to other countries. There have been a significant number of pandemics throughout history and in many instances; their control had been difficult because of the lack of a proper, working global surveillance system [6]. These pandemics show trends of developing microbial resistance and as a result, the death toll is usually high in pandemics than epidemics as concluded by the study comparing the mortality rate of influenza pandemic and epidemic [7]. As far as India is concerned, there have been only two major, significant pandemics throughout history. While cholera had been predominant throughout the 19th century with increasing death tolls every year, the influenza pandemic came later on in the early 20th century [8,9]. The influenza pandemic was short but devastating and after a long time, quite recently, came yet another flu pandemic by the H1N1 strain [10]. Though, it is almost impossible to analyze all epidemics and Pandemics throughout Indian history, effort has been made to include most of the significant ones.
19th Century:

Ist Cholera Pandemic (1817):

This is considered to be the first major epidemic of the 19th century in British-colonized India and was described as probably the most terrifying of all [11]. The first case was reported on 23rd August 1817 by a civil surgeon of Jessore [12]. The overall estimation of the mortality is not available as the data collection in India began much later, probably in the late 1860s. As for the geography, it is important to note that the year 1817 had brought a very heavy rainfall leading to flooding which could have been the cause for such a rapid spread [13]. While the Europeans living in India then and the elite were not seriously affected, the slum dwellers and people in rural poverty were hit the worst [14]. This was probably due to the differences in living conditions, personal hygiene and practices.

IInd Cholera Pandemic (1829):

The second outbreak started around 1826 from Bengal and spread through the rivers to various parts of northern India. After affecting the United Provinces (UP), its impact was huge on areas around Punjab and Delhi but most significant is its pandemic spread to countries like China [12,15]. Cholera spread far and wide, all along the trade routes from China affecting several cities and villages alike. In each place, it lasted for a few weeks and killed hundreds of people everyday [16].

IIIIrd Cholera Pandemic (1852):

This third cholera pandemic started around 1852 and lasted till the late 1860s. It is significant in history because of its spread to countries that were until then not affected. Though India was not its major area of impact, in the later phase of pandemic, small spurts of cases were noted in Bengal. It spread to several other countries like Persia, Arabia and then to Russia [12,15]. This was due to the worldwide spread of El Tor serotype of Vibrio which was initially endemic to India [17].

IVth Cholera Pandemic (1863):

This began around 1863. While some suggest that the major cholera epidemic in 1865 was brought to Mecca by the Haj pilgrims from India, others disagree stating that it was a just a recrudescence [18,15]. However, it is agreed that it was from Mecca that the infection spread to several countries [19,20]. The Kumbh Mela at Hardwar in April 1867 has been considered to be responsible for the epidemic spread of cholera in northern India [11]. The Madras Presidency in 1877 was the worst hit and the cholera epidemic was responsible for about 10% of the annual mortality then [21].

Vth Cholera Pandemic (1881):

The fifth cholera pandemic was considerably less fatal as compared to the previous four. It was during this pandemic (1881-1869) that Robert Koch proved that cholera was transmitted through the fecal-oral route, after studying the outbreaks in Calcutta and Egypt [22]. It spread to United Provinces and Punjab after which it spread to other countries like Afghanistan, Persia, parts of Russia and then to Europe [23].

Bombay Plague Epidemic (1896):

This plague began in September 1896 in colonial Bombay creating a lot of social and political frenzy. The rapid growth of commerce in Bombay led to an increase in population and thereby overcrowding. The anti-plague campaign was started to battle this epidemic and it was based on the belief that the focus of the infections was from the slums. The plague killed thousands and many people were forced out of the city [24].

VIth Cholera Pandemic (1899):

The sixth cholera pandemic began around 1899 and major outbreaks were noted in Bombay, Calcutta, and Madras [8]. While the infection throughout the 20th century was caused by O1 serotype of Vibrio cholera and confined mostly through the Asian subcontinent, the sixth cholera pandemic brought about surprising challenges. This cholera infection was caused by an unknown, non-O1 serotype of V.cholera and spread to many distant countries including the United States [25]. The sixth cholera pandemic lasted for about 25 years (1899-1973) [26].

20th Century

Influenza Pandemic (1918):

This is also known as the Spanish Flu of 1918-19. This has been known to have caused around 20-50 million deaths worldwide and is considered most devastating [27]. This was caused by the H1N1 strain of Influenza and was severe. The first episode of the disease began
in early 1918 and later in autumn, it began to spread all around the world, India considered to be the foci [28]. The second wave of the attack began in Bombay in 1918 and spread to other parts of northern India and Sri Lanka from where it spread worldwide [29]. Improvement in the virulence and velocity of the virus strain and the monsoon bringing humidity are considered to be the key factors in increasing the severity and spread [28].

**Polio Epidemic (1970-1990):**

India was the worst affected by polio among the developing countries until the late 1990s after which the EPI was initiated [30]. The incidence of polio in India was very high in both urban and rural states and the most affected was the state of Uttar Pradesh [31]. Its worst sequel was reported to be post-polio paralysis and in the district of Vellore, about 6/1000 preschool children were affected [32]. It was in 1964 in Bombay and 1965 in Vellore that the oral polio vaccine was introduced [33]. India had a choice between Salk’s IPV and Sabin’s OPV. Even after the introduction of the OPV in EPI there was no improvement to be noted for 10 years [33]. But with improvement in surveillance, the desired results were achieved and India was declared polio-free status in January 2011 and emphasis has been laid on maintaining the guard to prevent resurgence [30].

**Small Pox Epidemic (1974):**

It is known as one of the worst small pox epidemics of the 20th century. India contributed to about 85% of this epidemic worldwide. This epidemic broke out in three different villages of West Bengal, Bihar and Odissa but it was impossible to establish a connection between the men hence it was treated as three different epidemics. The disease was introduced into different areas by different sources. While over 15,000 people died in this epidemic, thousands of the survived but most of them but most ended up with disfigurement and blindness [34, 35]. Small pox was eradicated in by the WHO small pox eradication program. It was the first disease to be combated globally and was declared eradicated by WHO in 1980 [36].

**Plague Plague Epidemic (1994):**

Plague cases in Surat were first reported in Sept 1994 and which it spread to other cities in India. Fewer than 1,200 people were found positive and it lasted for less than two weeks but it is considered important due to its high fatality and created worldwide repercussions. It is said to have been initially difficult for doctors to diagnose it but when they did, all necessary precautions are taken to contain its spread [37].

**21st Century**

**(2001-2003)**

**Plague of Northern India (2002):**

The Plague of Northern India broke out in Shimla district of Himachal Pradesh in February 2002. It was a small and less serious epidemic. Also, as soon as the plague was detected, immediate measures were taken like fumigation, evacuation, and chemoprophylaxis that lead to further control of the epidemic [38].

**Dengue Epidemic (2003):**

In 2003 during September, there occurred an outbreak of DF/DHF in Delhi. It reached its peak around October-November and lasted until early December. The mortality rate was around 3%. It became a major outbreak in India in spite of the widespread preventive measures taken to control DF [39].

**SARS Epidemic (2003):**

SARS (severe acute respiratory syndrome), is considered as the first serious infectious disease outbreak of the twenty-first century. It initially started in the Guandong province of China in 2003 and spread quickly to about 30 countries across Asia, Americas and Europe and accounted for a total of 8,439 cases and 812 deaths, within 7 to 8 months [40,41].

**(2004-2006)**

**Meningococcal Meningitis Epidemic (2005):**

In early 2005, a sudden surge had been noted in meningococcemia and meningococcal meningitis cases in India. Cases were reported from Delhi and the surrounding states of Uttar Pradesh and Maharashtra. Around 430 cases of meningococcal meningitis were reported as of June 2005 [42]. Case management, early detection through surveillance was aimed at prevention of spread [43].

**Chikungunya Outbreak (2006):**

Around 3.4 million cases of Chikungunya were reported in Ahmedabad 2006 with 2,944 deaths.
estimated. The mortality rate in 2006 epidemic was substantially increased when compared with that in the previous four years [44]. In December, there occurred another epidemic in South India where the states of Andhra Pradesh, Karnataka and Tamil Nadu were affected. The volatile nature of this epidemic was attributed to the herd immunity to the then isolated genotype [45]. Major efforts were taken for mosquito control and several awareness campaigns were initiated by the television and print media [46].

**Dengue Outbreak (2006):**

The outbreak began in early September of 2006 and the first case was reported from Delhi. By the end of September, it began to spread to other states like Rajasthan, Kerala, Gujarat, Chandigarh and Uttar Pradesh [47]. The ministry of health set up a control room to monitor the outbreak and provide technical assistance that led to the efficient management of the disease [48].

**(2007-2010)**

**Gujarat Jaundice epidemic (2009):**

Modasa town in Gujarat witnessed the outbreak of hepatitis B in 2009[49] This is of significance because almost all outbreaks of viral hepatitis in India were considered to be due to hepatitis E which is feco-orally transmitted [50]. It was a long-lasting epidemic and control was achieved by mass public awareness and health actions.

**H1N1 Flu Pandemic (2009):**

The H1N1 Flu pandemic began in May 2009 and spread globally by July 2009. By August 2010, it was declared pandemic and around 18,500 deaths were reported from all around the world [51, 52]. Three strains of influenza viruses were circulating then of which the Inf A (H1N1) and Inf A (H3N2) viruses were largely replaced by the pdm H1N1 strain [53,54].

**(2011-2014)**

**Odisha Jaundice Epidemic (2014):**

The outbreak began in November 2014 in Kantalbai, a remote village in Odissa. This led to a district level investigation and it was confirmed to be jaundice caused by the Hepatitis E virus [55]. This 2014 Odisha Jaundice epidemic was one of the many outbreaks in Odisha and the most common cause being HEV [56]. This is transmitted enterically and has affected several people, especially of the low socioeconomic category. Surveillance for clean water and sanitation was proposed as the control measure [57].

**(2015-2018)**

**Indian Swine Flu Outbreak (2015):**

It refers to the outbreak of the 2009 H1N1 flu pandemic in India which was still present as of March 2015. This outbreak in 2015 is considered as a resurgence of the infection and the most plausible reasons are considered to be low temperature, decreasing host immunity and failure of vaccination campaign after 2010 [58]. According to the NCDC data in India, Rajasthan, Maharastra, and Gujarat were the worst affected states in India during this pandemic [59].

**Nipah Outbreak (2018):**

The virus was first noted in the late 1990s in Singapore and Malaysia. The natural host for this disease is the fruit bat and transmission is from direct person to person contact [60]. This Nipah virus outbreak began in May 2018 in Kozhikode District, Kerala. This is the first Nipah virus outbreak reported in Kerala and the third known to have occurred in India, with the most recent previous outbreak being in 2007 [61]. Spread of awareness about this infection, isolation of the infected and post-outbreak surveillance led to the control of this outbreak [62].

**Conclusion**

India has stood strong through several epidemics and pandemics. Good medical care and efficient researches have made it possible to fight every infection and luckily, we have been able to even eradicate a few. It can be established that throughout time, many infectious diseases have become widespread due to the mere lack of sanitation and crowded environment. The tropical climate and the seasonal rains in India is yet another important factor contributing to several vector-borne infections outbreaks in the past and many more to come. Though it has been difficult to compile all the epidemics and pandemics due to lack of sufficiently available data and errors in data preservation, sincere efforts have been put into including most of the important, notable ones. This is written with a hope that it may help medical
professionals understand where they had gone wrong in controlling an outbreak in the past or how they succeeded to lead by example. It is also a sad truth that India will have to face several more such outbreaks in the days to come but preparedness has to be given immense importance and control of spread should be the number one priority of the doctors and other health care workers.

Ethical Clearance- No ethical clearance was necessary for this research work

Source of Funding- Self funded project

Conflict of Interest – Nil

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A Review on Common Oral Mucosal Lesions Associated with Pediatric Patients

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Abstract

Pediatric oral pathology deals with the conditions causing or resulting from morbid anatomic or functional changes in the structures of the mouth in the pediatrics. Children and adolescents exhibit a wide spectrum of oral lesions including hard and soft tissue lesions of the oral maxillofacial region. Oral pathoses in children are often missed since obtaining detailed history and performing thorough clinical examination and more difficult in comparison with an adult. Oral lesions in children include mucosal conditions, developmental anomalies, neoplastic, reactive or inflammatory lesions. Thus this review article provides a brief note on the oral lesions commonly dealt with pediatric patients.

Keywords: Developmental, Neo-natal, Mucosal lesions, Hemangioma.

Introduction

The diseases of the oral cavity comprise an important part of the pediatric specialty and in pediatric dentistry, yet many are misdiagnosed or left untreated because of less understanding, resources and parental education. Although the variety of lesions are usually confined to the oral cavity, they might provide certain clues to the underlying more serious systemic conditions. These may vary from physiological variations linked to development, to tumors. And majority of the diseases that manifest with oral features in the neonates being asymptomatic and benign, commonly resolve without any intervention. However, a thorough clinical examination and knowledge of the various lesions is essential for accurate diagnosis, management, as well as proper parental counseling.

BASIC CLASSIFICATION ON COMMON ORAL MUCOSAL LESIONS AMONG PEDIATRIC PATIENTS:

<table>
<thead>
<tr>
<th>CYSTS</th>
<th>Epsin pearls</th>
<th>Gingival cysts of newborn/neonates</th>
<th>Bohn's nodules</th>
<th>Eruption cyst</th>
<th>Epidermoid and dermoid cysts</th>
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<tbody>
<tr>
<td>LESIONS DUE TO TRAUMA</td>
<td>Mucocele</td>
<td>Riga-Fede disease</td>
<td>Ranula</td>
<td>Eosinophilic ulceration</td>
<td>Breastfeeding keratosis</td>
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<td>Lymphangiomia</td>
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<td>MALIGNANT NEOPLASM</td>
<td>Malignant melanoma</td>
<td>Rhabdomyosarcoma</td>
<td>Spindle cell sarcoma</td>
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</tbody>
</table>
CYSTS

EPSTEIN PEARL

This is an non-odontogenic, keratin-filled cyst results from epithelial remnants entombed along the fusion line of the palatal halves, with no gender predilection. They are apparently entrapped epithelial remnants. They are smooth, whitish, keratin filled 1-4 mm papules. These are clinically asymptomatic and appear as nodules in the mid-palatal raphe region along the line of fusion. They resolve in the first 3 months hence treatment is not needed. Their incidence is 7.3/1000 live born male newborn babies \[1,2,3,4,5\].

GINGIVAL CYSTS OF NEWBORN/NEONATES:

Gingival cyst also called as Dental lamina cysts arise from remnants of dental lamina. The gingival cysts are frequently observed in newborns (13.8%) with no gender predilection. These asymptomatic, multiple, 1-3 mm, nodular, creamy white lesions present on the crest of dental ridges, sometimes appearing blanched as though from internal pressure \[6\]. Histopathology shows keratin-filled true epithelial cysts. These lesions are present on birth and are self-resolving hence do not require any intervention \[5\]. Prevalence ranges from 25-53\% \[7\].

BOHN’S NODULE:

Bohn’s nodules are remnants of minor salivary gland epithelium. They are keratin-filled cysts with prevalence of 47.4\% with no gender predilection. They are mostly asymptomatic, smooth, whitish keratin filled nodules or papules ranging from 1-3 millimeter arise on the buccal and lingual aspects of the ridge away from the midline \[6\], also present along the junction of the hard and soft palate as they are derivatives salivary gland structures \[8\]. They resolve in the first 3 months of life and have an Incidence of 47.4\% \[9\].

ERRUPTION CYST:

This soft tissue benign cyst arises around an erupting tooth when the dental follicle separates from the crown of tooth and results in fluid collection within this space \[10\]. The pathogenesis involves impediment of eruption by overlying dense fibrotic mucosa. Clinically they present dome shaped and may appear normal to blue-black, purple or brown in color subject to the amount of blood in the cystic fluid after trauma (hematomas), compressible swelling within the mucosa, overlying the erupting tooth. It may also be transparent. Since the tooth erupts through the lesion it resolves. Surgical opening of the roof of the cyst is indicated if it becomes infected or does not rupture. The prevalence of eruption cysts of is 22\% \[11,12\].

EPIDERMOID AND DERMOID CYST:

They are benign developmental disorder with an incidence of 7\% in the head and neck region and 1.6\% in the oral cavity. An epidermoid cyst is lined by epidermis where as a dermoid cyst is lined with adnexa glands. Surgical enucleation is the treatment of choice and recurrence is rare \[13\]. Treatment includes surgical enucleation. Recurrence is rare. \[14\]

LESIONS DUE TO TRAUMA

MUCOCELE:

Mucocoele common lesion in children and adolescents, that arises due to rupture in the minor salivary glands excretory duct, with subsequent leakage of mucin into the adjacent connective tissues that later may be surrounded in a fibrous capsule, occurring in approximately 2.7\% of patients under the age of one \[15\]. It can be of two types: Extravasation and retention mucoceles, the former affecting the lower lip most frequently. Extravasation type often affects the younger age group and results due to trauma \[16\].

Diagnosis can be confirmed by FNAB and histopathological evaluation. Conventional treatment includes surgical excision to minimize the risk of recurrence. \[17\]

RANULA:

Ranulas are a rarity in newborns, presenting as a swelling in the floor of the mouth and are commonly caused by extravasation of mucin than retention cyst. The incidence is estimated to be approximately 0.74\%. If the lesion is superficial, the mucosa may have a translucent bluish color \[6\]. Diagnosis can be arrived with the aid of FNAB, MRI, and histopathological assessment \[18\]. Treatment includes observation for asymptomatic cases, aspiration, cryosurgery, marsupialization, or surgical excision with or without sublingual gland depending upon the variant (cervical or plunging ranula) \[19\].

RIGA-FEDE DISEASE

Riga-Fede disease is a rare benign reactive mucosal
disease. The most common contributory factor is trauma due to the rubbing of natal or neonatal tooth during feeding on the ventral tongue surface, lip, gingival, vestibular mucosa, palate and floor of the mouth [20]. Clinically, the lesion appears ulcerated, unifocal/multifocal, and occasionally painful. Inability to diagnose and treat this lesion may result in dehydration and inadequate nutritional intake [21]. Treatment should be conservative and focus on creating round, smooth incisal edges. Alternatively extraction is the treatment of choice. Diagnosis is confirmed by clinical examination and histopathology to rule out bacterial, fungal infections, immunologic diseases, and neoplasia as causative factors for ulcers [22]. Prevalence of natal-neonatal teeth ranges from 1:6000 to 1:800 [23].

**BREASTFEEDING KERATOSIS:**

Breastfeeding Keratosis Recently, Kiat-Amnuay and Bouquot reported a case of breastfeeding keratosis, nonresponsive to antifungal drugs, in a 2-month-old child. It is a type of frictional keratosis from exuberant sucking in a breastfeeding infants. History elicited from parents revealed unusual habit of active lip sucking habit in-between the feeding sessions. Clinically it is a well-demarcated, nonsloughing, white, keratotic plaque of the lower lip mucosa, just inside the vermilion border. The plaque has an aslight irregular surface, had no surrounding erythema. Cytopathology revealed no mycotic structures. With diminution of habit, the lesion regressed by the 4th week with no recurrence. [24].

**INFECTIONS CAUSED MUCOSAL LESIONS**

**NEONATAL CANDIDIASIS:**

Neonatal Candidiasis Disseminated is the second most common cause of mortality with a reported incidence of 2 to 20% in preterm newborns. The transmission of Candida can be vertical or due to external contaminations [25]. The most common opportunistic Candida species include Candida albicans (75%) followed by Candida glabrata, Candida krusei, Candida tropicalis, and Candida parapsilosis. The risk factors comprise immature immune system, prolonged catheterization, prolonged hospital stay, etc. Oral manifestations include white plaques on oral mucosa, composed of hyphae, epithelial cells, and necrotic tissues [26]. The prominent systemic features include meningitis, urinary tract and cardiovascular infections. Diagnosis is confirmed by blood culture, urine and CSF. Treatment incorporates preventive measures [27].

**NEONATAL HERPES SIMPLEX VIRUS:**

Herpes simplex virus 1- (HSV)1 causes orolabial lesions. They are transmitted during parturition and depend on maternal infection (primary or recurrent), maternal antibody, intact mucocutaneous barriers, duration of membrane rupture and delivery [28]. The incidence ranges from 1 in 3,000 to 20,000 live births-cesarean or normal. The incubation period varies from 4 to 21 days after delivery, with symptoms appearing between 6 and 21 days. The eruptions commonly involve the mouth, scalp, face, soles of the feet, and palms of the hand. Characteristically, vesicular eruptions appear as single unit or in clusters, measuring about 1 to 3 mm in diameter, which often ulcerate within a few days [29]. Diagnostic modalities include serological tests, polymerase chain reaction amplification analysis of cerebrospinal fluid (CSF), and viral cultures. Treatment and prophylactic measures involve antiviral therapy with acyclovir [30].

**IMMUNOLOGICAL**

**NEONATAL PEMPHIGUS VULGARIS**

Neonatal pemphigus vulgaris is a rare autoimmune, vesiculobullous disease caused due to transmission of maternal immunoglobulin G auto antibodies which counter transmembrane glycoprotein desmoglein three. It manifests as multiple mucosal, cutaneous or mucocutaneous ulcerations after birth. These are intraepithelial blisters and are seen on soft palate, buccal mucosa, verutra surface of the tongue, gingiva and lower lip [31]. In more advanced stages desquamative or erosive gingivitis may be present. The other oral manifestations include sialorrhea, halitosis and brown or blackish crusts at the vermilion border. Symptoms resolve in 2 to 3 weeks and the diagnosis is confirmed by histopathology and immunofluorescence. The incidence is 0.68 cases per 1,00,000 persons per year [32].

**BENIGN NEOPLASM**

**HEMANGIOMA:**

This is a most common benign vascular neoplasm emerging as a macule on birth but may appear a few weeks after and regresses into spotted pigments. It appears on neck and head, trunk, extremities, lips, tongue, buccal mucosa, palate and uvula and has a
slight female predilection. Predisposing factors include infantile age, infant birth weight, childbearing age, gestational hypertension, Kasabach-Merritt syndrome [33]. Diagnosis is made by history, Fine-Needle Aspiration Cytology (FNAC), MRI, and/color doppler USG, histopathology, and immunohistochemistry ruling out other vascular malformations [34]. Treatment guidelines are based on the stage of the lesion and includes drugs (propranolol, corticosteroids, α-interferon), lasers (CO2, diode, flash lamp pulsed dye), and surgical corrections. Complete resolution occurs in 70% cases but around 40 to 50% of the cases show permanent changes in the skin, such as telangiectases, stippled scarring [35].

LYMPHANGIOMA:

Lymphangiommas are benign neoplasms of the lymphatic channels with 50% of cases noted at birth and 90% of cases developing before the age of 2. The prevalence is 1–3/10,000 live births, affecting both the genders equally, involving 75% of the head and neck region followed by trunk, abdomen, and extremities [36]. Treatment modalities include surgery, cryotherapy, electrocautery, sclerotherapy, steroids, embolization, and ligation, laser surgery (neodymium-doped yttrium aluminum garnet, CO2) and radiation therapy. Recurrence is high, 39% in case of tongue, followed by hypopharynx and larynx [37].

CONGENITAL EPULIS OF NEWBORN

Also called as Granular cell tumor (or) Neumann’s tumor is one of the rare benign tumors of oral cavity . It arises as gingival mucosal mass on the anterior maxillary ridge. The etiology is unclear hence the lesion is perhaps hormone related, degenerative or reactive The tumor shows a female predilection (8:1–10:1 ratio) [38]. The lesion occurs three times more commonly in the maxilla than mandible, frequently involving the alveolar ridge near the canine region. Clinical presentation includes a single and firm with a regular surface. It maybe multilobed, sessile or pedunculated, pink or red lesion not tender to palpation. The diameter varies from a few millimeters to over 7cm covered by a smooth normal/reddish mucosal surface [39]. Larger lesions cause mechanical obstruction in feeding and respiration in neonates. Diagnosis is confirmed by USG, CT/MRI, and histopathology, which appears similar to other granular cell tumors in adults, but is distinguished based on its exclusive origin from the neonatal gingiva, the scattered presence of odontogenic epithelium, lack of interstitial cells with angulate bodies, and the more elaborate vasculature. Treatment includes complete surgical excision with no reported cases of recurrence [40].

Malignant Neoplasm

In a 40-year review of solid malignant neoplasm in neonates by Hasen Xue et al, it was revealed that malignant neoplasms are extremely rare in newborns and involvement of oral tissues even rarer. The majority of cases involved head and neck followed by trunk and extremities. Oral cavity involvement was seen in only two cases: Malignant melanoma (hard palate) and spindle cell sarcoma (tongue) [41]. In another review of 60 years by Campbell et al, only one case of rhabdomyosarcoma (tongue) was observed. Such cases require prompt diagnosis and multimodal management for a diseasefree survival [42].

Conclusion

Neonates presenting with intraoral lesions mandate precise diagnosis, management, and parental reassurances and counseling. Hence management of oral pathology in neonates should encompass a thorough knowledge of various oral lesions and the ability to clinical and radiographic examination inclusive of any added investigation for precise diagnosis, prognosis, treatment outcomes and parental counseling.

Ethical Clearance – Not needed as it is review article

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Verrucous Carcinoma- A Case Report

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Abstract

Verrucous carcinoma is a variant of squamous cell carcinoma. It most typically affects the mouth with buccal mucous membrane being the most typical site affected. Clinically its proliferative finger like projections or a cauliflower like growth could be a typical feature towards diagnosis. It’s more common in tobacco user and more predilection in males. The histopathological diagnosis of verrucous carcinoma is quite difficult and need immense expertise to report a case of verrucous carcinoma. Though verrucous carcinoma is a benign lesion with minimum aggressive potential however long standing cases shows transformation into squamous cell carcinoma. Here in we discuss the clinical and histopathological finding of the case of 80 year old male patient with oral verrucous carcinoma on buccal sulcus as a differential diagnosis with possible etiology, management of the lesion.

Keywords - verrucous carcinoma, buccal mucosa, incisional biopsy, cauliflower like growth.

Introduction

Oral Verrucous carcinoma is a variant of squamous cell carcinoma which was 1st delineated by Lauren V Ackermann in 1948 therefore it was called ‘Verrucous malignant neoplastic disease of Ackermann” or “Ackermann’s Tumor”¹. Different names utilized in literature are Buschke-Loewenstein tumour, florid oral papillomatosis, epitheliomacuniculatum, and carcinoma cuniculatum². Common site of incidence is mouth, other sites being pyriform sinus, larynx, nasal cavity, esophagus, external auditory canal, paranasal sinuses, legs, scrotum, skin, perineum, penis, vulva, vagina, and uterine cervix³, 4. Oral verrucous carcinoma features a predilection for male in sixth decade with a slow growing rate and becomes regionally invasive if not treated properly. But, there is a rare distant metastasis⁶. Clinically, it is featured as a plaque like lesion with finger like projections resembling cauliflower⁵. Any type of Tobacco as smoking and smokeless type, alcohol and opportunist infective agent, infections are the foremost associated etiologies with Oral Verrucous Carcinoma⁶, 7. So early diagnosis and surgical excision of the lesion is the most appropriate treatment modality of verrucous carcinoma.

Case Report

An 80 year old male patient reported with a painful growth in the right buccal mucosa for the past 3 months. Patient had a habit of betel nut chewing since 40 years, 5-6 times/day. On general examination patient had normal gait posture, well oriented, moderately built and conscious. No evidence of icterus, pallor, cyanosis, clubbing was present. Single left submandibular lymph node was palpable and was firm, mobile and tender on palpation. Clinical intra oral examination revealed a soft growth of 2x1.5 cm in size, well defined with irregular invasive if not treated properly. But, there is a rare distant metastasis⁶. Clinically, it is featured as a plaque like lesion with finger like projections resembling cauliflower⁵. Any type of Tobacco as smoking and smokeless type, alcohol and opportunist infective agent, infections are the foremost associated etiologies with Oral Verrucous Carcinoma⁶, 7. So early diagnosis and surgical excision of the lesion is the most appropriate treatment modality of verrucous carcinoma.

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biopsy was taken. The histological cut was performed and stained in hematoxylin and eosin. The hematoxylin and eosin stained histopathological section of the given specimen showed hyperplastic parakeratinized stratified squamous epithelium with underlying connective tissue stroma. Wide elongated reteridges are seen with pushing margins. Parakeratin plugging was seen(fig-1). Pseudoepitheliomatous hyperplasia was noticed (fig-2). The fibrous connective shows moderate cellularity and diffuse mild chronic inflammatory cell infiltrate with increased vascularity. Therefore, the histopathology diagnosis confirmed the diagnosis of verrucous carcinoma.

Discussion

Verrucous carcinoma, as mentioned most typically affects older male with adverse habits of tobacco and alcohol. Lesions usually develop at the location wherever the tobacco is placed habitually. In Ackerman’s study, eleven out of eighteen patients (61%) with squamous cell carcinoma of buccal mucosa were tobacco chewers. Other etiologic factors like poor dental hygiene, ill-fitting dentures, low socioeconomic status, tobacco chew, snuff, alcohol use, and smoking also causes verrucous carcinoma. Some of the similar factors that predispose people to the event of premalignant lesions like, submucous fibrosis (SMF), erythroplakia and leukoplakia. Untreated long standing leukoplakia has been reported to transform into Verrucous Carcinoma. Oral verrucous carcinoma are largely massive, exophytic, soft, and fungating growth with pebbly surface having regionally aggressive nature. Enlarge lymph nodes are typically palpable. Diagnosis of verrucous carcinoma histopathologically is quite difficult and needs expertise to diagnose.

The term “verrucous” was applied for lesions showing a exophytic keratotic surface composed of blunt or sharp epithelial projections with keratin-filled invaginations (plugging). The microscopic anatomy of Verrucous Carcinoma, for instance, verrucous surface and “elephant feet” like down growth superficial to compress the underlying connective tissue and usually showing least or absent cytologic atypia seen. By flow cytometry, Verrucous Carcinoma could be a diploid lesion; on the contrary, the traditional squamous cell cancer typically shows genomic instability and aneuploidy. As a result of its benign cytological features, besides the focal basal cell nuclear hyperchromatism, distinction from Verrucous carcinoma and verrucous hyperplasia (VH) can’t be primarily based solely on microscopic anatomy features. Differential diagnosis of verrucous carcinoma includes: (i) Proliferative verrucous leukoplakia, (ii) squamous cell carcinoma showing verrucoid feature (iii) verruca vulgaris (iv) keratoacanthoma. (v) Pseudoepitheliomatous hyperplasia. The simplest treatment modality of Verrucous Carcinoma is surgical resection. So, the patient is additionally suggested for surgical removal of the lesion and regular follow up. Although Verrucous Carcinoma doesn’t show distant metastasis, supra omohyoid neck dissection is usually considered as a result of its benign cytological features, besides the focal basal cell nuclear hyperchromatism, distinction from Verrucous carcinoma and verrucous hyperplasia (VH) can’t be primarily based solely on microscopic anatomy features. Differential diagnosis of verrucous carcinoma includes: (i) Proliferative verrucous leukoplakia, (ii) squamous cell carcinoma showing verrucoid feature (iii) verruca vulgaris (iv) keratoacanthoma. (v) Pseudoepitheliomatous hyperplasia. The simplest treatment modality of Verrucous Carcinoma is surgical resection. So, the patient is additionally suggested for surgical removal of the lesion and regular follow up. Although Verrucous Carcinoma doesn’t show distant metastasis, supra omohyoid neck dissection is usually considered as a result of the slow growth pattern surgical margins are compromised. The presence of carcinoma in place of clinically improper resections will lead to the development of recurrence of invasive cancer in apparently traditional epithelial tissue or previous excision sites. Radiation therapy is contraindicated in treatment of Verrucous Carcinoma as radiation induced anaplastic transformation.
Conclusion

In most of the cases verrucous hyperplasia, verrucous carcinoma, verrucous keratosis are clinically indistinguishable from each other. Thus histopathological proof is important to allow an acceptable diagnosis. Verrucous carcinoma presents as thick verrucous keratotic lesion that is additional common in males and is typically painless. Verrucous Carcinoma related to leukoplakia or submucous fibrosis is also a sign of “field cancerization” and might cause multiple recurrences, therefore it’s extremely suggestive, that such patients should be kept under regular follow up.

Ethical Clearance – Not needed as this is a case report.

Source of Funding – Nil

Conflict of Interest – Nil

References

ODONTOPHOBIA is dental anxiety. Often people have an extreme level of anxiety from dental visits and treatment practices carried over by dental surgeons. It may arise from their past painful experiences while visiting the dentist. Due to their extreme fear or odontophobia the patients’ oral health are hampered largely. Not only the patients avoid getting treated from dentists but finds all sorts of bizarre excuses for being spared from the same. This mainly happens due to lack of proper knowledge or awareness regarding the dental field or proper desensitization in their early childhood when fear and anxiety were seeding inside. This review literature, will shed some light on various factors associated with anxiety as well as proper management of the same. A thorough knowledge in this field will not only help the dentists to understand their patients but also motivate the patients towards dental treatment.

Keywords: Dental anxiety, conditioning pathway, vicarious pathway, informative pathway, verbal threat pathway, parental pathway, Cognitive behavioral therapy.

Introduction

The term odontophobia is often called as Dental Fear or Dental phobia or Dentist Phobia or Dental Anxiety. This is considered as multidimensional complex phenomenon and no single variable is responsible for its development. It is a unique phobia with some special psychosomatic components that impact on the dental health of odontophobic persons. For some individuals the fear is so great that normal life is impaired. Most of the time individual experiences fear and anxiety which is out of proportion than actual danger present in the situation. This often leads to avoidance behaviour. The incidence of fear and anxiety consistent throughout the world. According to Diagnostic and Statistical Manual Of Mental Disorders (DSM-IV) criteria for Dental phobia, is a marked and persistent fear of clearly discernible circumscribed objects or situations. In most of the studies it is seen people from low socioeconomic classes are prone to dental anxiety more than that of higher socioeconomic classes. Women show more dental anxiety than male also children reported more anxious than adults. These psychosomatic factors relating dental procedures affects their attitudes behaviour and practice. Thus in this group of individual it is seen that not only they avoid dental treatment but also tend to have poor oral health. Since dental practices not only depends upon the techniques applied or the technical skills of dental professionals but also on patients, their attitudes and behaviour, these psychological issues and misconceptions can disrupt the harmonious relationship between dentists and patients. Thus understanding the factors behind the etiology of such withdrawal behaviour may help the dentists as well as researchers with coming up new interventions that may reduce dental avoidance behaviour.

Signs & Symptoms of Odontophobia

This type is categorized under special phobia according to DSM-IV. In DSM-IV it has stated that an intense irrational fear of dentists or receiving dental care
Dental anxieties are generally associated with personality types and one’s susceptibility towards anxiety rather than being a part of a precious painful dental treatment (4). Exposure, observations even sometimes thoughts of it causes an immediate anxiety reaction. Following are the symptoms and signs of odontophobia: Profuse sweating, Hyperventilation, High blood pressure, Feeling of terror, Rapid heartbeat, Nausea, Irrational fear of teeth, Panic attacks, Shortness of breath, Dry mouth, Anxiety, Trembling.

PATHWAYS OF FEAR

5 pathways that are thought to specifically relate to dental fear and anxiety: Cognitive Conditioning, Vicarious, Verbal Threat, Informative, and Parental.

CONDITIONING PATHWAY: Conditioning is a process where the participant learns through personal experience that the event or stimulus heralds a detrimental outcome (5,6). In 1927 Pavlov published his seminar paper on conditioned reflexes where he showed animals can learn to associate a conditioned stimulus with a new non-conditioned stimulus so that non-conditioned stimuli cause a conditioned response. Here, the animal (dog) began to associate food and salivating with the sound bell, thus anytime the bell sounds he will start to salivate (7). In a similar attempt to correlate physiological responses with fear, Rachman (8) in 1975 successfully demonstrated that responses like sweating, increased heart rate occur when individuals experience fear are evident with odontophobia that is whenever patients come in contact with dental environment (9, 10-12). In summary, the conditioning pathway appears to be the most commonly utilized pathway by patients.

INFORMATIVE PATHWAY: The informative pathway is another indirect pathway for fear acquisition, which does not require the presence of an unconditioned stimulus. As far back as 1977, studies (13) noted that the instructional process of child rearing may lead to biases for commonly encountered fears. Children learn to fear the dental environment from dental phobic elders, negative connotations advertised by media (e.g., television, movies), and friends with personal negative experiences.

VICARIOUS PATHWAY: The vicarious pathway is an indirect pathway for fear acquisition that does not require the presence of an unconditioned stimulus. Studies suggested that fears can be socially transmitted, either vicariously (observationally) or via information, without an individual directly experiencing trauma themselves (13). Although it is well accepted that fears can be acquired by observing others responding fearfully to a particular stimulus (e.g., Bandura, 1969), there is little research on whether children can acquire fears in this way. In adults, the majority of evidence for vicarious learning of clinical fears comes from questionnaire studies that require phobic individuals to retrospectively attribute their fear to direct conditioning, verbal information, or vicarious learning (14).

VERBAL THREAT PATHWAY: The verbal threat pathway presents another indirect pathway for fear acquisition that does not require the presence of an unconditioned stimulus. To explain the origin of a fear that is not seen or experienced, it is essential to understand the “emotion” of fear. This “emotion” is known as the “tripartite,” and appears to govern onset and origin of fears generated by the verbal threat pathway (15-19). Many articles examining the effects that “word of mouth” made the children become fearful of a stimulus or situation when they hear or read that it may be dangerous. Through various studies it is found out that self-reported fears increase as children were given violent/dangerous/threatening information about a particular stimulus, irrespective of its actual threat (17, 18, 20-22) by an adult. Simultaneously, it has been found that giving positive information results in a decrease in children’s self-reported fear (23, 24). In short, one interpretation of the verbal threat pathway is that fear is induced when an authority figure threatens an individual with a painful experience. In the case of dental fear, painful and/or negative experiences are linked to dental visits. A “visit to the dentist” is literally used as a form of punishment for bad behavior.

PARENTAL PATHWAY: The parental modeling pathway presents another indirect pathway for fear acquisition that does not require an Unconditioned Stimulus. The concept of parental modeling is supported by research (25) which demonstrates a sample of 40 children between the ages of 9 and 12 years, where children’s fear was directly related to their mother’s dental fear. Specifically, mothers who expressed heightened levels of fear in front of their children were more likely to have fearful children.
DIAGNOSIS AND TREATMENT OF ODONTOPHOBIA:

Dental phobia can be diagnosed using standardized scales such as Corah’s Modified Dental Anxiety Scale.

So prior to any appointment of such patients dental practitioners should take initiative to take care of some psychological aspects in his/her mind in order to carry on a successful dental treatment. A visit of psychologists are generally required to deal these type of patients and to motivate them to undergo the procedure thereby reducing the fear.Certain Anxiety treatments for phobias like a) Relaxation technique, b) Systemic desensitization c) Cognitive behavioral therapy, d) Modelling techniques. Brief detail are as follows:

RELAXATION TECHNIQUES: With increased incidence of odontophobias nowadays many dental practitioners arranging therapist session with the patients, where one to one interactions takes place between trained psychiatrist and patient. They are motivated in different ways and guided to control their fear & anxiety regarding dental environment. This is based on the principle of exposure and gradual desensitization. With increasing number of sessions amount of exposure is raised gradually. In this way patient learns to tolerate dental anxiety stimulated by the exposure of dental services with the help of relaxation techniques.

SYSTEMIC DESENSITIZATION: This behavioral technique was developed by Joseph Wolpe in 1958 for treatment of anxiety disorders including phobias. The process of systemic desensitization undertakes a gradual process of reducing a person’s anxiety towards a particular stimulus. This treatment can be administered in various settings, it has three basic steps:

STEP 1: Patients asked to imagine pleasurable things, do calming breathing exercises, meditation or any other type of muscle relaxation techniques

STEP 2: Patients are asked to formulate a list of imaginative phobic situations, rate each of them from 100 to 0 level of anxiety felt by the patients. After that the list used by therapist and patient to construct an anxiety hierarchy.

STEP 3: Once the person learns to efficiently master the relaxation techniques and has constructed the hierarchy of anxiety, in this final step therapist administers various treatments and asks the patient to slowly move the imaginary anxiety hierarchy, starting with least anxiety-provoking situations and associating the situation with the learned relaxation techniques. This is known as Counter Conditioning.

COGNITIVE BEHAVIORAL THERAPY (CBT): Psychological treatment used for mood and anxiety disorders as well as phobias. This therapy includes the reformation of maladaptive thoughts and beliefs acquired by the person about some particular things. It is very helpful in dentistry and to overcome dental fear or odontophobia. The cognitive components of the therapy examines the person’s thoughts and patterns of thinking and focuses on reducing those by cutting down the negative emotions and actions that are build up from those.

MODELLING: Developed by Albert Bandura. In this technique the person observes others (models) and learns from them how to face phobic situations without getting afraid and relaxed. In this way the patient learns to encounter the phobic situations.

PHARMACOLOGICAL: The use of nitrous oxides and benzodiazepines has long been used to reduce anxiety.

HYPNOTHERAPY: Perhaps one of the least understood treatments for dental fear is hypnotherapy (HT). HT attempts to create a state of unconscious change, whereby the individual forms new responses, attitudes, and behaviors to previously feared stimuli. Few studies have analyzed the clinical effectiveness of hypnotherapy. In 1995, research reported that when compared to psychophysiological therapies such as CBT, HT did not significantly reduce dental fear.

RECENT ADVANCES: COMPUTER ASSISTED RELAXATION LEARNING

A recent development in the treatment of dental fear, computer assisted relaxation learning (CARL) is a self-paced treatment for dental phobic individuals for treating needing phobia. The program begins with introducing
its purpose, followed by activities and videos on how to cope with their fear. This program is based on theory on Systemic Desensitization. In recent study on 2013 researchers stated that CARL significantly reduce self-reported general and injection-specific dental anxiety.

Conclusion

In this article different types of fear their psychological factors and their origin in dentistry along with management have been discussed. This psychological review would help dental practitioners to get an clear idea about the psychological state of this specific category of patients and the amount of stress they undergo in presence of dental stimuli. The techniques for management discussed here can be used in day to day dental practise to ensure proper painless treatment to the patient. It will also help the patients to improve their oral health by visiting a dentist on regular basis which will in turn improve their physical health too without having dental anxiety.

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Review Article

Prophecy of Orofacial Diseases with the Help of Amniotic Fluid

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Abstract

Amniotic fluid is a yellowish clear fluid that protects the fetus in the uterus. Amniotic fluid forms an accepted physical barrier against fetal trauma and defense against fetal infection. Amniocentesis is primarily used to detect birth defects in an unborn baby. The other invasive techniques such as chorionic villus sampling, percutaneous umbilical blood sampling, fetoscopy. Orofacial disease, neural tube defects and various syndromes can be detected by this procedure. This diagnosis helps us to know about the defects thereby giving choice of possible treatments, terminating or continuing the pregnancy.

Keywords: Amniotic fluid, Amniocentesis, Placenta, Micrognathia

Introduction

Amniotic sac is a bag in which amniotic fluid is present. This fluid provides room for fetal growth, movement and development. The fetal pulmonary development takes place around 20 weeks. The fluid protects the fetus from trauma and maintains the temperature. Amniotic fluid also aids in the dilatation of cervix during labor. The volume of amniotic fluid raises in accordance to the gestational weeks. About 500 ml of amniotic fluid enter and leave the amniotic sac each hour. The volume increases up to 1000 ml at about 28 weeks of gestation and then gradually decreases. The condition in which there is reduced amount of fluid is termed as Oligohydramnios. The condition in which there is increased amount of amniotic fluid of about 2000 ml or more is termed as Polyhydramnios. Low levels of amniotic fluid would be due to underproduction, loss or it can be idiopathic. Underproduction can be the result of absent or dysfunctional kidneys, urinary tract obstruction, abnormal placental function, or maternal dehydration. Elevated amniotic fluid is due to decreased absorption, overproduction or idiopathic. Decreased absorption typically results from failure of fetal swallowing from etiologies such as tracheal atresia, tracheal or bowel obstruction, or neurologic abnormalities such as Anencephaly, Chromosomal abnormalities, Non-immune Hydrops, and Diabetes mellitus can also be reasons for polyhydramnios1.

Objectives

The main objective of the prenatal diagnosis is to provide information about the presence or absence of genetic disease and malformations thus reducing anxiety among high risk groups. Some of the diseases for which prenatal diagnosis available includes congenital malformation, chromosomal disease, non-genetic fetal disease, multiple malformation syndrome, metabolic disorder, neuromuscular disorder and hematological disorder. There are invasive and non-invasive techniques. The non-invasive methods include Ultrasound, Fetal cell detection in maternal circulation and Magnetic Resonance Imaging. The invasive methods include Amniocentesis, Chorionic villus sampling, Peri-
implantation genetic diagnosis.

**Amniocentesis**

Amniocentesis is a procedure in which the amniotic fluid is withdrawn with a needle and is sent to the laboratory for genetic testing. The cells shed from skin of fetus and float in the amniotic fluid. Genetic amniocentesis is usually done between 15 and 20 weeks of pregnancy. Amniocentesis done before 15 weeks has been associated with higher rate of complications. A 22 gauge long needle is inserted through uterine wall into the fluid filled space. Approximately 20 ml of amniotic fluid is withdrawn which is being aided by ultrasound to avoid injury to the fetus. The fluid which is withdrawn is sent for culture in which the procedure takes place in an incubator. Various tests are being performed in the cultured cells like chemical analysis, DNA analysis and chromosomal analysis.

### Amniocentesis procedure

**AMNIOCENTESIS PROCEDURE**

- The prenatal diagnosis is indicated in the following conditions
- Advanced maternal age of above 35 years.
- Chromosomal abnormalities in previous pregnancies.
- Rhesus sensitization.
- Consanguineous marriage.
- Elevated levels of AFP (alpha fetoprotein) in blood.
- Abnormal parental karyotyping.
- Genetic testing.
- Endocrine disorder.
- Infection and parasitic disease during pregnancy.
- Fetal therapy
- Lung maturity.

### Complications:
- Maternal complications are rare. The Ultrasound guidance has minimized the risk of fetal injury.
- Miscarriage may happen which is expected to be less than 1%.
- Needle injury are rare.
- Soreness may occur at the injury site
- Mild cramping and spotting may also be seen.

### Other Invasive Method

1. **Chorionic Villus Sampling:** Involves sampling and culturing of the chorionic villi (ideally 10 to 20 mg), that make up part of the placenta providing information about foetal genetic and chromosomal status (via karyotyping and In Situ Hybridization), and is done between 10 to 12 weeks of gestation, thus providing earlier and more than 99% accurate results. It can be done either trans-cervically or trans-abdominally, using ultrasonography guidance.

2. **Percutaneous Umbilical Blood Sampling (PUBS):** It is used when rapid chromosome analysis is needed, particularly toward the end of pregnancy, when ultrasonography has detected abnormality in the foetus pointing to a chromosomal abnormality. However, usually it is performed after 19 to 20 weeks of gestation.

3. **Fetoscopy:** It is an endoscopic procedure performed trans-abdominally during or after the 18th week of pregnancy, allowing access to the foetus, the amniotic cavity, the umbilical cord, and the foetal side of the placenta. It is used to evaluate the foetus for birth defects, such as spina bifida, and collection of blood sample from the umbilical cord, which is then analyzed in the laboratory for genetic or chromosomal disorders.

### Orofacial Diseases Diagnosed by Amniocentesis

The orofacial disease commonly diagnosed by
The manifestations include low birth weight, Clubbed feet, Micrognathia, Cleft lip and palate. Due to the medical problems associated with Edward syndrome, most babies affected will die before the end of pregnancy or are stillborn. Around 5-10% of the babies born alive with Edwards syndrome live longer than one year. These children often have a severe intellectual disability and may require specialized nursing support.  

Edward syndrome

- Cru di chat syndrome: It is also known as 5p syndrome. It is a genetic condition that is caused by deletion of genetic material on small areas of chromosome 5. Although it is a well-defined genomic disorder, individuals with this syndrome show phenotypic and cytogenetic variability. The manifestations include low birth weight, severe cognitive speech, motor disabilities, Microcephaly, Micrognathia, Hypertelorism and flat nasal bridge. Other abnormalities include Cystic hygroma, Epignathus, Myoblastoma. Metabolic disorders like Hurler syndrome, Hunter syndrome, Gauchers disease, Maple syrup disease. Malformations, although not very frequent, may be present includes Cardiac, Neurological and Renal abnormalities, Preauricular tags, Syndactyly, Hypospadias, and Cryptorchidism.

Cru di chat syndrome

- Down syndrome: It is also called trisomy 21. Down syndrome is one of the most common birth defects that causes severe developmental delay, distinct facial features and cardiac manifestations. The manifestations include oblique eye fissures, flat nasal bridge, Micrognathia, Microdontia, Macroglossia and Fissured tongue. Excessive joint laxity and low IQ.

Down syndrome

- Cleft lip and palate: Cleft lip occurs 1 in every 600 live births. It is a common birth condition occurring alone or as a part of genetic condition or syndrome. Clefts of the lip and/or palate (CLP) are common birth defects of complex etiology. CLP can occur in isolation or as part of a broad range of Chromosomal, Mendelian or Teratogenic syndromes. Although there has been marked progress in identifying genetic and environmental triggers for syndromic CLP, the etiology of the more common nonsyndromic (isolated) forms remains poorly characterized. The manifestations include Speech disorder, Feeding problems, Physical deformity, Hearing loss, Nasal congestion or snoring.

Cleft lip and palate

- Edward syndrome: It is also called as trisomy 18. It is a condition causing severe developmental delay due to an extra chromosomes 18.
• Patau syndrome: It is also called as trisomy 13. A condition in which person has an extra chromosome 13. It is a heterogenous disorder encompassing multiple malformations including central nervous system, cardiac and urogenital anomalies\textsuperscript{10}. The manifestations includessevere Craniosynostosis, Craniofacial abnormalities, Symmetric syndactyly of hands and feet, Cleft lip and palate, Micrognathia, Prominent bilateral cleft lip.

**Patau syndrome**

![Image of a baby with Patau syndrome](image)

**Conclusion**

The rise of amniocentesis as a tool for accurate prenatal diagnosis has made it possible to identify many orofacial genetic disorders and treat few of them. Invasive and Non-invasive prenatal diagnosis has been a great tool in detection of various syndromic conditions. It has evolved as a boom to the recent prenatal screening thus reducing the threat of birth of syndromic children and other complications.

**Ethical Clearance** – Not needed as it is review article

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Sex Hormones: Its Impact on Women’s Oral Health – A Review

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Abstract

Hormonal variations in different stages of women’s life have a pronounced influence on oral health. Fluctuating levels of sex hormones (estrogen, progesterone and androgen) during different life stages in women such as puberty, menstruation, pregnancy, menopause has a direct and indirect effect on oral health. Alterations in the subgingival microflora, salivary flow, gingival crevicular fluid, epithelial keratinisation and bone are noticed when there is a change in the hormonal levels. Steroid sex hormones have its effects mainly on periodontal and gingival health. This review article focuses the influence of sex hormones in the various reproductive cycles of women on oral health.

Keywords: Hormones, Oral, Estrogen, Menopause, Menstruation, Pregnancy

Introduction

Female life are characterized by vast changes in reproductive hormones which result in significant changes throughout the body including oral cavity. Hormonal fluctuations during puberty, menstruation, pregnancy and menopause influence a woman’s oral health. Increased and decreased sex hormones also have an effect on oral health. Localization of estrogen receptor and progesterone receptor has been reported in the human periodontium. This demonstrates the significant influence of estrogen and progesterone on the periodontium. Steroid sex hormones (androgens, estrogens, and progesterone) have an effect on cellular growth, proliferation, and differentiation of keratinocytes and fibroblasts in the gingiva. The review discusses the diverse oral presentations by the effects of various hormones at varying stages of a woman’s life cycle.

Sex hormones and oral health

Androgen: Androgen contribute to the growth and reproduction in both men and women. Female body produces a small amount of androgen. In women, the androgens are converted into either testosterone or estrogen by the ovary. Testosterone receptors are identified in periodontal tissues. The receptors on the fibroblast tend to rise in inflamed gingiva. Testosterone inhibits the effects on cyclooxygenase pathway of arachidonic acid metabolism in gingiva inhibiting prostaglandin secretion. It increases matrix synthesis of fibroblasts and osteoblasts by periodontal ligament.

Estrogen: Estradiol (a most potent estrogen) and esterone is secreted by ovary. Estradiol is the physiological estrogen which is more abundant in premenopausal women. Receptors for estrogen are identified in gingiva, periosteal and periodontal ligament fibroblasts and osteoblasts. Estrogen reduces osteoclastic activity and it induces apoptosis. In menopause where a minimal level of estrogen is detected systemic bone loss is seen. Frequency of bone loss in postmenopausal stage anticipate tooth loss. Estrogen deficiency causes upregulation of immune cells, and osteoclast leading to increased production bone-resorbing cytokines.

Progesterone: Progesterone is secreted by placenta, corpus luteum and adrenal cortex and is active in bone metabolism. Progesterone increases the production of prostaglandins and inhibits proliferation of gingival fibroblasts. It alters the rate and pattern of collagen production in gingiva followed by reduction in repair and maintenance potential.

Women’s reproductive life cycle and oral health

Puberty:

Increased prevalence of gingivitis can be correlated...
during puberty. Puberty gingivitis characterised clinically by the presence of inflammation of the facial and marginal gingiva sometimes extending to involve the attached gingiva and interdental papillae. In subgingival microflora, there is a higher incidence of black pigmented bacteriodes and gram-negative rods when compared with healthy sulci in puberty. There is an increase in a particular species such as *Spirochetes*, *Capnocytophagia*, *Actinomycetes* and *Eikenellacorrodens*. *Capnocytophagia* have been associated with increased bleeding. There is an absence of attachment loss and bone loss associated with puberty gingivitis. This gingivitis is reversible following puberty.

Menstruation:

The menstrual cycle is a 25-30 day period controlled by the secretion of sex hormones which has a responsibility of continued ovulation till menopause. Muhelmann was the first person to report gingival changes during menstrual cycle. He coined the term “gingivitis intermenstrualis” to describe a condition of bright red hemorrhagic lesions in the interdental papilla. Increased sex hormones during menstrual cycle moderates the development of localised gingival inflammation. Some women experience oral changes due to monthly fluctuation of hormones, that include bright red hypertrophic gingiva and salivary glands, canker sores or gingival bleeding. This condition is termed as menstruation gingivitis, occurring a day or two before the start of period and clears up after period has started. Exudates from inflamed gingiva is elevated during menstruation suggesting aggravation of existing gingivitis. Other oral changes are burning sensation, recurrent oral ulcers and herpes labialis and infections with Candida albicans had been reported. This has been attributed to alterations in immune response.

Pregnancy:

Progesterone and estrogen are elevated during pregnancy due to the continuous production of hormones by corpus luteum. Pinard (1877) recorded the first case of pregnancy gingivitis. Increased level of progesterone causes gingival diseases during 8th month of pregnancy, a condition called pregnancy gingivitis. Pronounced inflammatory response of gingiva, bleeding upon provocation and increase in gingival exudate are characteristics of pregnancy gingivitis. Pregnancy associated pyogenic granuloma (Granuloma gravidarum) can also occur anytime during pregnancy. It is sessile or pedunculated protuberant mass more commonly seen in interproximal area of maxilla. These changes are reversible following parturition. During pregnancy estrogen, progesterone and chorionic gonadotropin affect microcirculatory system by causing swelling of endothelial cells and pericytes of the venules, increased vascular permeability, and vascular proliferation.

Periodontal infection increases during early gestation due to alterations in immune system which is due to the hormonal changes during pregnancy. Increased number of *P. gingivalis* and *P. intermedia* (periodontopathogens) are noted. Periodontal infection is associated with adverse pregnancy outcomes. Researchers suggest that maternal periodontitis has been associated adverse pregnancy outcomes such as preeclampsia, gestational diabetes and fetal loss. The increased risk also suggests that periodontitis may be an independent risk factor for adverse pregnancy.

Menopause:

Menopause is the physiological process occurring in fifth decade life of a woman. As a consequence of advanced age, numerous oral changes occurs in menopause. It includes altered taste and burning sensation in mouth, greater sensitivity to hot and cold foods and beverages, decreased salivary flow resulting in dry mouth. Burning pain, most commonly involves the anterior two-thirds, dorsum, lateral borders of the tongue, anterior hard palate and mucosa of the lower lip. Burning mouth syndrome is most commonly reported by the perimenopausal women. Oral mucosal changes differs from atrophic pale appearance to menopausal gingivostomatitis, characterised by dry and shiny gingiva which bleeds easily and reduction in flow of saliva. Xerostomia occurs in 25% to 50% of women. Reduction in flow rate occurs due to decrease in the level of estrogen at the menopausal stage in women. Persistent sensation of dry mouth is experienced by menopausal and postmenopausal women. Decrease in salivary flow is responsible for increase in caries, candidiasis, plaque formation which in turn cause gingivitis and periodontitis. Association between psychological symptoms in menopausal women and oral discomfort is one of the reason for altered salivary flow indicating psychological stress. Other possible disease are oral candidiasis, pernicious anemia and nutritional
disorders. Decline in estrogen during menopause frames a greater risk for bone loss leading to osteoporosis and periodontitis. Postmenopausal women lose 30% to 50% of trabecular bone and 25% to 35% of cortical bone mass that was present between the age of 20 and 30 years. Alterations in the sex hormones during menopause is considered to be a factor for inflammatory changes in gingiva. Hormone receptors are identified in the basal and spinous layer of the epithelium and connective tissue. In perimenopausal women, the incidence of Oral lichen planus is higher than in general population and increases significantly the severity of depression. Lichen planus can be mediated by declined level of estrogen and progesterone directly or indirectly. Trigeminal neuralgia is observed frequently due to compression of branches of trigeminal nerve. It is characterised by searing, stabbing or lancinating pain in the middle and lower third of face. Other neurological disorders such as atypical facial pain / neuralgia and Alzheimer’s disease affect postmenopausal women. Menopausal women also suffer from erosion of enamel, perimolysis, enlarged parotid glands, angular chelitis, dehydration and bulimia.

Conclusion

Fluctuations in sex steroid hormones have a major impact on women’s oral health. The various phases in the reproductive lifecycle of women such as puberty, menstruation, pregnancy and menopause influences women’s oral health. It is of prime importance that dental care professionals are aware of these gender-specific oral health concerns. The addition of periodontal care with obstetric management may improve pregnancy outcomes. It is vital that clinicians consider periodontal care as an integral component of prenatal care. Recognition that women of different ages have specific oral health concerns will likely lead to improved oral health status in women of all stages.

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Review article

Role of Chemotherapy and Radiotherapy in Salivary Gland Neoplasms

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Abstract

Oral cancer is the second most common cancer in India. Salivary gland tumors are rare and have very wide histological heterogeneity, thus making difficult to generate high level evidence. The major salivary glands are parotid, submandibular and sublingual glands. A wide variety of conditions including obstructive, infectious, autoimmune and neoplastic pathologies affects salivary glands. In this review clinical features, investigations, chemotherapy and radiotherapy are included and mainly focuses the management approaches. Surgical management being ideal for salivary gland neoplasms, radiotherapy and chemotherapy also give hand for better treatment outcomes. The choice of radiotherapy and chemotherapy depends upon the grade and stage of the disease. The treatment plan differs for each case and we had highlighted the common treatment protocols that can be followed for salivary gland malignancies.

Keywords: Chemotherapy, Radiotherapy, Salivary gland tumors.

Introduction

Salivary glands are exocrine glands in mammals that produce saliva and acts as a primary barrier for oral health [1]. Neoplasm is defined as ‘A neoplasm is an abnormal mass of tissue, the growth of which exceeds and is uncoordinated with that of the normal tissues, and persists in the same excessive manner after cessation of the stimulus which evoked the change’[2]. Oral cancer is the second most common cancer in India accounting for 40% of all cancers. Salivary gland malignancies are less common and represents approximately 5% of all head and neck cancers [3]. We are aware of the role of chemotherapy and radiotherapy in squamous cell carcinomas, but have limited knowledge of their implementation in salivary gland malignancies. It is important to know about the treatment options so that clear cut treatment modalities can be framed for different salivary gland tumors [4].

Clinical Features

Parotid gland is most commonly involved in salivary gland neoplasms. Malignant tumors of salivary gland shows different patterns. The most common tumors are Adenoid cystic carcinoma, Mucoepidermoid carcinoma and Acinic cell carcinoma. About 64-80% are located in parotid (common in superficial lobe), 7-11% in submandibular glands and reminder being distributed between the sublingual (1%) and the minor salivary glands(9-23%) [3]. Clinically the malignant tumors will present with rapid rate of growth, facial nerve involvement and cervical lymphadenopathy. Common sites of distant metastases are the lungs, bone and liver [4]. The annual incidence of salivary gland neoplasm ranges from 1.5 to 4.0 per 100000 in different parts of the world [5]. Surgery is the initial treatment for salivary gland malignancies [4]. But for high grade tumors surgery alone is not sufficient for complete resolution. Radiotherapy in patients with high risks improves the locoregional control in selective patients [6].

Investigations

The diagnosis of salivary neoplasms is essential to proceed with treatment[4]. Fine needle aspiration cytology and core biopsy are the investigative techniques, with accuracy ranging from 87% to 96% for FNAC but the risk of seeding tumor cells is negligible.
Ultrasound guided core biopsy of salivary gland, especially the parotid gland tumors is very useful in the tissue diagnosis where we cannot get conclusive diagnosis from the FNAC alone[4]. Ultrasound guided core biopsy is done under local anaesthesia by using 18-20G needle [7]. It has 100% diagnostic appearance and we can do Immunohistochemistry thus avoiding unnecessary open biopsies [8]. For small tumor masses of salivary gland, punch biopsies can be done [9]. Frozen section is another investigation and it needs experienced pathologists to avoid false reports. The major advantage in this is for benign tumors the accuracy rate is 98.7% [10]. Ultrasonography can compliment these investigation and less expensive with accuracy rate of 100% [8].

CT and MRI can be done for malignant tumors or when deeper parotid lobe lesion is suspected. MRI is particularly recommended for demonstrating the interface of tumor and surrounding tissues especially the facial nerve when parotid gland is involved [4]. The advantage of MRI includes elimination of dental artifacts and the ability to distinguish between a tumor and obstructed secretion [8].

Management:

Surgical excision is the first line of management for salivary gland neoplasm. Surgical management of primary tumor is by wide margin excision. Clinically high grade of tumors should be managed with excision of the gland plus 2 cm margin of apparently healthy tissue [10]. Primary radiotherapy may be applicable in operable patients were palliation can be achieved. The role of heavy ions such as proton and carbon ion therapy is being explored and is as yet resolved [3].

Chemotherapy plays a palliative role. Integration between radiotherapy and chemotherapy provides increased local control of tumor. In advanced metastatic carcinomas there are few cases which was treated with a chemotherapeutic agent. Cisplatin is considered as a back bone of polychemotherapeutic regimes. The most commonly used regime for squamous cell carcinoma is cisplatin and fluorouracil. Mean duration of complete response for the drug is 7 to 18 month[11] and relapsed disease cisplatin, antracycline, paclitaxel and vinorelbine are the most effective agents. But combined therapy was more toxic than individual chemotherapy agents [12]. In salivary gland tumors of advanced stage or metastatic carcinomas, chemotherapeutic agents were used in few cases. For malignant salivary gland tumors such as mucoepidermoid carcinoma and adenocarcinoma Taxol is found to be effective. Combination of carboplatin and taxol given among 14 patients in a study showed 2 partial responses and stabilized disease in 7 patients. Whereas combined cisplatin, adriamycin and cyclophosphamide showed total response rate between 27% and 50%. The protocol cisplatin, adriamycin or epirubicin and with flurouracil had total response between 37% and 47% when compared to combination of cisplatin, bleomycin, adriamycin/VP-16. [13].

Recent studies have evaluated the molecular targets in salivary gland tumors and these chemotherapy drugs have achieved response rates between 6% to 20% and stable diseases of 25-40% cases. It was identified as C-Kit is tyrosine kinase receptors plays an important role in development of haematopoietic cells, melanocytes and germ cells which is expressed more in salivary gland neoplasms. Inhibitors of anomalous tyrosine kinase have been identified as Imatinib [14].

Epidermal growth factor is an important mediator of cell growth, cell differentiation and survival. In salivary gland tumors these factors are also increased and cetuximab is the drug of choice for this abnormality[15].

In a retrospective study various chemotherapeutic drugs or targeted drugs such as adruamycin, carboplatin, methotrexate, docetaxel, bacilli calmett Guerin were offered for patients with distant metastasis. However the survival rates are same as without chemotherapy (35.2% vs 27.6% respectively [16].

A review of systematic therapy in the management of distant metastasis of salivary gland tumors by Lagha et al showed that the most effective chemotherapeutic agent seems to be platinum, 5-Fluorouracil and Anthracyclines, and recommended that symptomatic locally recurrent or metastatic patients adapt platinum combined with doxorubicin to maximize the likehood of a response and for cases of slow disease progression and asymptomatic patients, a single agent therapy is sufficient. Adjuvant chemotherapy has no proven role in the treatment [16]. Chemotherapy in most of the studies elected to the meta-analysis was done a palliative intent[17].

Radiation therapy is considered as ideal treatment modality for salivary gland tumors and used as both curative and palliative methodology [18]. The parotid
salivary gland consist purely of the serous gland are the most sensitive compared to the submandibular glands from a clinical perspective \(^{(19)}\). The radio sensitivity of the parotid salivary glands may be because they contain heavy metal granules. During treatment, the ionizing radiation causes the destruction of the metal granules by means of a metal-catalyzed induction of lipid peroxidation causing release of lytic enzymes into the cell’s cytoplasm, hence autolysis of cells are evident. The ionizing radiation causes the salivary glands to undergo structural degradation and eventual death of the affected cell \(^{(20)}\). Atri et al found that dose tolerance of the salivary glands varied between 32 Gy and 46 Gy. However, the curative dose of head and neck tumors may rise to 60 Gy or more. This value is more than the dose tolerance range of the salivary glands. Above the dose tolerance range of the salivary glands may lead to permanent injury and dysfunction of the salivary glands and causes xerostomia \(^{(21)}\). Despite the knowledge that the degree of injury of the salivary glands is dose related the mechanism behind the destruction of salivary gland by ionizing radiations are not well known. Furthermore, the side effects which are a consequence of xerostomia remain difficult to quantify\(^{(22)}\).

Traditional treatment for salivary gland carcinomas is surgery. For high grade tumors combined with radiotherapy will give a better prognosis. In a study conducted by florida university treatment outcomes of radiotherapy alone and combined with surgery is compared. Their study showed better result in the local control of the tumor. Radiotherapy with reference to other two studies conducted in different universities they have concluded that the surgery and the post surgical radiotherapy shows increased local control and survival in advanced stage or high grade tumors\(^{(5)}\).

In a study of 53 patients with advanced salivary gland tumor treated with fast neutron radiation therapy, the follow up of 42 months showed about 92% of patients with locoregional control \(^{(23)}\). By this study they concluded that for high grade tumors the neutron radiation alone is needed.

**Conclusion**

The use of Radiation and chemotherapy technique during treatment of head and neck tumors minimizes the salivary gland injury thus reducing the degree of xerostomia and related side effects among patients treated for head and neck tumor. Management of people treated for head and neck tumors needs a multidisciplinary approach involving dentists with dental care during and after radiation therapy. The optimal treatment for salivary gland carcinoma is surgery. Postoperative radiation therapy is associated with an improved outcome for patients with advanced stage disease, incomplete resection, and/or high grade histology. A modest subset of patients are cured with radiation therapy alone. Neutron radiation therapy may be associated with an improved outcome for patients with macroscopic disease but probably better results in moderate and severe cases.

**Ethical Clearance** – Not needed as it is review article

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Comparison of Centring Ability of Different Rotary and Reciprocating Systems- An In Vitro Study

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Abstract

Background: Several rotary Ni-Ti and reciprocating have been evolved with variable tapers, variable pitch diameters, M-wire technology and non cutting tip that are claiming to maintain original canal shape with emphasis on centering ability.

Aim: To compare the centring ability, apical third canal transportation and change in canal curvature of different rotary and reciprocating systems, in vitro.

Materials & Method: Fifty mesial canals of freshly extracted molars with completely formed apices, angles of curvature 15° - 25° and radii of curvature <10 mm were selected. Teeth were decoronated with a standard length of 15mm and randomly assigned into five groups, which include K3, ProTaper Next, WaveOne, Reciproc and stainless steel hand K-files. Pre–instrumentation and post–instrumentation CBCT were taken. Centring ability, apical third canal transportation and change in angle of curvature were calculated for each group and compared.

Statistical Analysis: One way ANOVA and Post Hoc Tukey- B tests were used to analyze the data.

Results: With regards to centring ability ProTaper Next showed the maximum centring ability and the least was for Hand K- files. Apical third canal transportation was found to be maximum in Hand K- files and minimal in ProTaper Next. Reciproc produced the least change in canal curvature followed by ProTaper Next, K3 and Hand K-files respectively.

Conclusion: Within the limitation of this study, it may be concluded that ProTaper Next has the best centring with least canal transportation. Reciproc proved to be as good as ProTaper Next.

Keywords: Centring ability, apical third canal transportation, angle of curvature.

Introduction

Proper cleaning and shaping establishes the necessary conditions for the success of the root canal treatment. Numerous investigators have proved that effective cleaning and shaping are adversely affected by highly variable and complex root canal anatomy. The flexibility of Ni-Ti instruments allowed 360° rotation in root canal preparation without much alteration of...
root canal configuration. Several rotary Ni-Ti systems have been evolved with variable tapers, variable pitch diameters, M wire technology and non cutting tip that are claiming to maintain original canal shape with emphasis on centering ability.

Off late, much research is focused on reciprocating motion which postulates reduction in Ni-Ti instrument separation, which commonly occurs in a 360° rotation, without a warning. By repeating the clockwise and counter clockwise rotation, balanced force technique is simulated, which according to many, does better cleaning and shaping with less cyclic fatigue. Not many studies have been done in the reciprocating systems with reference to centering ability.

Schilder has emphasized that root canal preparation should present a continuous taper from apical to coronal, preserving the apical foramen and not altering the original canal curvature which should be the principal aim in the centering ability of any instruments. Hence, a comparative analysis of two rotary and two reciprocating systems has been evaluated in this study with reference to centering ability, apical third canal transportation and change in canal curvature.

**Materials and Method**

**Sample preparation:**

Fifty mesial canals of freshly extracted molars, with fully formed apices with angles of curvature 25° to 35° degrees and short radii <10 mm were stored in 10% formalin. Ethical committee clearance was obtained from Sree Balaji Dental College and Hospital Ethical Committee, Bharath University (protocol Reference no. SBDCECM 106/14/09). Access cavity was done with a #4 round carbide bur. For more uniform samples, decoronation was done and a final dimension of 15 mm working length was achieved for each tooth.

**Image Analysis:**

Roots were embedded into impression compound and were positioned in a custom made specimen holder. All teeth were scanned by “ORTHOPHOS XG 3D” Cone Beam Computed Tomography CBCT scanner (Sirona systems, Germany) before and after instrumentation. Exposure parameters were 120kv and 5mA. The field of view was 8cm in diameter and 8 cm in height. Slices were 800 x 800 pixels, with a resolution of 0.160 mm.

Three virtual sections from each tooth, the number of the tooth, and its level were recorded onto a magnetic optical disk. The sections were 1) 3 mm from apex, 2) 6 mm from apex and 3) 9 mm from apex. After initial CBCT, the root canals were instrumented by using manufacturer recommended technique. A final CBCT image was taken and data were analyzed. Acquired data was used to calculate the centring ability and apical third canal transportation. The angle of curvature & radius of curvature was standardized.

**Evaluation of Centring Ability:**

The mean centring ratio indicates the ability of the instrument to stay centred in the canal. The pre-instrumented and post–instrumented shortest distance at 3 , 6 and 9 mm were measured from the edge of the canal to the periphery of the root, both in mesial and distal directions by using “Sirona CBCT software.”

Calculation was done for each section by using the following formula by Gambill et al:

\[
\frac{(a_1 - a_2)}{(b_1 - b_2)} \text{ or } \frac{(b_1 - b_2)}{(a_1 - a_2)},
\]

where \(a_1\) and \(a_2\) represent the shortest pre instrumentation and post instrumentation mesial distances, respectively, and \(b_1\) and \(b_2\) represent the shortest pre instrumentation and post instrumentation distal distances, respectively. According to this formula, a result of 1 indicates perfect centring.

**Evaluation of Canal Transportation:**

Transportation was calculated according to the formula of Gambill et al:

\[
(a_1 - a_2) - (b_1 - b_2),
\]

where \(a_1\) and \(a_2\) represent the shortest pre instrumentation and post instrumentation mesial distances, respectively, and \(b_1\) and \(b_2\) represent the shortest pre instrumentation and post instrumentation distal distances, respectively.

**Root Canal Preparation:**

A size 10 K-file was placed into the canal until it was visible at the apical foramen, and the working length was established 0.5 mm short of this length. The teeth were randomly divided into 5 different experimental groups (10 teeth each). All root canals were instrumented to the working length with sizes 10, 15 K-files by using a step-back technique, followed by respective rotary and reciprocating systems according to manufacturer recommended instructions. Instrumentation was done with the help of “VDW Gold Reciproc motor” (VDW, Germany).
Teeth were randomly divided into 5 experimental groups depending upon the respective rotary and reciprocating systems used for cleaning and shaping:

- Group A = K3 (n=10)
- Group B = ProTaper Next (n=10)
- Group C = Wave One (n=10)
- Group D = Reciproc (n=10)
- Group E = Stainless steel hand K - files (n=10)

Final apical preparation diameter for Group A and Group B (Rotary group) was 25/06 and for Group C and Group D (Reciprocating group), it was 25/08. Group E (control group) were shaped by using balanced force motion of pre-curved hand K-files with a step-back technique. Final apical preparation size was 25/02 taper.

After the use of each file, canals were irrigated with 3 ml of 3% NaOCl solution. For all groups, when root canal instrumentation was completed, 1 ml of 17% ethylene diamine tetraacetic (EDTA) acid was used for 1 minute followed by a final flush of saline. Figure 3 is a schematic representation of the methodology.\

**STATISTICAL ANALYSIS:**

Statistical analysis was done using one way ANOVA and the multiple comparisons between the experimental groups were done using Post Hoc – Tukey B test. A probability value less than 0.05 was considered to be statistically significant ($P < 0.05$).

### Results

An overview of the summary statistics indicates that, the least centring is found to be for hand K- Files and the highest is found in ProTaper Next. Post-Hoc Tukey- B tests carried out on centring ability showed that there was a significant difference between ProTaper Next, WaveOne and hand K- files ($P < 0.05$) [Table 1]; [Figure 2].

As far as “apical third canal transportation” is concerned, Hand K files were found to have the maximum transportation and it was minimal with ProTaper Next. Post- Hoc tests for apical third canal transportation showed that there was a significant difference between ProTaper Next, WaveOne and Hand K- files ($P < 0.05$) [Table 2]; [Figure 3].

With respect to “Change in Canal curvature” the least mean value was found with Reciproc and the highest with hand K files. Reciproc proved to be producing the least change in canal curvature followed by ProTaper Next and K3 respectively. Post Hoc - Tukey B tests for change in canal curvature showed that, there was no significant difference between Reciproc, ProTaper Next a n d K3 respectively. But there was a significant difference between them as compared to WaveOne and hand K- files respectively ($P < 0.05$) [Table 2]; [Figure 3].

| Table 1- Mean values of centring ability at 3,6 & 9 mm |
|----------------|----------------|----------------|----------------|----------------|
|                | K3             | ProTaper Next  | WaveOne        | Reciproc       | Hand K files   |
| Centring ability at 3mm | 0.7730 | 0.8890 | 0.6650 | 0.7320 | 0.2820 |
| Centring ability at 6mm | 0.6820 | 0.8220 | 0.5890 | 0.6640 | 0.2750 |
| Centring ability at 9mm | 0.4780 | 0.5800 | 0.3780 | 0.4660 | 0.1070 |
### Table 2 – Post Hoc test Apical third canal transportation & Change of canal curvature

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3</td>
<td>0.0560</td>
<td>0.01430</td>
<td>1.30</td>
<td>0.483</td>
</tr>
<tr>
<td>ProTaper Next</td>
<td>0.0300</td>
<td>0.01563</td>
<td>1.20</td>
<td>0.422</td>
</tr>
<tr>
<td>WaveOne</td>
<td>0.0810</td>
<td>0.02424</td>
<td>1.40</td>
<td>0.516</td>
</tr>
<tr>
<td>Reciproc</td>
<td>0.0630</td>
<td>0.02163</td>
<td>1.10</td>
<td>0.316</td>
</tr>
<tr>
<td>Hand K files</td>
<td>1.1110</td>
<td>0.55967</td>
<td>2.30</td>
<td>0.675</td>
</tr>
<tr>
<td>Total</td>
<td>0.2682</td>
<td>0.48917</td>
<td>1.46</td>
<td>0.646</td>
</tr>
</tbody>
</table>

* very statistically significant; # extremely statistically significant

---

![Figure 1](image1.png)

**Figure 1** - Standardization Of (A) Angle Of Curvature and (B) Radii of Curvature

![Figure 2](image2.png)

**Figure 2** – Graph showing the mean of centering ability
Discussion

The goal of instrumentation is to produce a continuously tapered preparation, with effective cleaning and shaping that maintains the canal anatomy, keeping the foramen as small as possible without any deviation from the original canal curvature. However in root canals these goals are not easy attainable and root canal instrumentation becomes even more difficult in curved canals.

Several studies have confirmed the superiority of Ni-Ti files over stainless steel file in shaping the root canals without much aberrations in canal anatomy. Metallurgy and instrument design are the two principal factors that decide the centring ability of any rotary instrument.

Two of the main characteristics of Ni-Ti alloy, are shape memory and super elasticity. The elastic limit of Ni-Ti alloys in bending and torsion is two to three times higher than that of stainless steel instruments. These unique properties are related to the fact that NiTi is a so-called ‘shape memory alloy’, existing in two different crystalline forms: austenite and martensite. The austenitic phase transforms into the martensitic phase on stressing at a constant temperature and in this form needs only light force for bending. After release of stresses the metal returns into the austenitic phase and the file regains its original shape.

Several strategies have been used to improve the fatigue resistance of NiTi endodontic instruments. These strategies include electro polishing, ion implantation, surface coatings, and heat treatment. Heat treatment has proven to create a more optimal phase transition point between austenite and martensite. Research has shown that M-wire, a metallurgically improved version of NiTi, reduces cyclic fatigue by 400% when comparing files of the same D0 diameter, cross-section, and taper. The scanning transmission electron microscopy study found presence of martensite and perhaps R-phase in the cross-sections of M-Wire, which is absent in the microstructure of conventional Ni-Ti wire. M-wire technology has been used in ProTaper Next, Wave One and Reciproc files. Hani.F.Ounsi et al concluded that, the difference in shaping ability of different rotary instruments may be related to respective geometric characteristics of the instrument design which includes cross section, helical angle, pitch, number of blades and cutting angle.

Reciprocating Movement:

During reciprocation, the instrument rotates in counter-clockwise and clockwise directions, with approximately 120° of difference between both movements. To complete 360° rotation, each instrument has to complete 3 cycles. Therefore it requires, 10 cycles of reciprocation per second, equivalent to 300 rpm according to Yared. When the instrument rotates in the counter clockwise direction, it will advance in the canal and engage dentin to cut it. When it rotates in the opposite direction (smaller rotation), the instrument will be immediately disengaged. The end result related to both Clockwise (CW) and Counter Clockwise rotations (CCW), produces an advancement of the instrument in the canal. Consequently, advancement of instrument would be almost self regulatory with the gentle guidance of operator. This action reduces the cyclic fatigue, risk of taper lock, file separation and apical extrusion of debris. In reciprocating movement proposed by Yared wherein he states that instrument engages in the canal when rotating in CCW direction and disengages in CW directions.
Centering ability of ProTaper Next at 3, 6 and 9 mm as compared to other groups exhibited the highest centering ability and least apical third transportation [Table 1 & 2]. The results obtained can be attributed to designed feature of instrument where 0 - 3 mm has a centered mass and axis of rotation from D1 to D3. The offset design (D4 - D16) has enabled the instrument to be better centered in apical third of the canal. The offset design minimizes the engagement of the file with dentine thereby increasing flexibility compared to symmetrical portion of apical third. Hence it might be emphatically stated that offset design of ProTaper Next has remarkably improved the centering ability.

Among the other groups K3 prove to be marginally better than Reciproc and distinctly better than WaveOne and hand K-files in canal centering ability and apical third canal transportation (Table 1 & 2). Hence a concept of design like asymmetrical cross section, variation in helical angle and flute depth has proven to play a major role.

Between Reciproc and remaining other groups (i.e. Wave One and Hand K-Files) Reciproc exhibited better centering ability with least apical third canal transportation [Table 1,2]. This could be attributed to S shaped geometry with a double cutting edge and having a smaller cross sectional area which increases the flexibility. The positive rake angle in Reciproc allow cutting dentine chips that curl away from the edge of the blade as compared to WaveOne which has a negative rake angle that scratches the dentine surface. The radial lands in WaveOne tend to burnish the cut dentine on to the root canal wall so Ni-Ti instruments with active cutting edge blades are superior to instruments with radial land with respect to debris removal capacity. Hence radial land present in the tip region of WaveOne instrument maybe responsible for more transportation and lesser centering ability as compared to other groups. Significant difference at 9 mm generally for all groups as compared to 3 and 6 mm may be attributed to canal geometry.

**Conclusion**

- Within the limitation of this study, it may be concluded that even though ProTaper Next owing to its offset design, produced the best centering with least canal transportation. However, the fear of instrument separation without a warning for 360° rotary instrument is ever prevailing.
- Reciproc instrument with a reciprocating motion has proved to be as good as ProTaper Next could be safely used as compared to the other systems of rotary endodontics, is evident from the results obtained in this study.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from Institutional Ethical Committee (Sree Balaji Dental college & Hospital, Chennai – 600100) (Ref no: SBDCECM106/14/09).

**Acknowledgement:** Nil

**References**

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Accidental Large Extrusion of Epoxy Resin Sealer in the Periapical Area – A Case Report with three Years Follow up

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Abstract

Aim: To evaluate the post operative complications and tissue tolerance of accidentally extruded epoxy resin sealer in a mandibular second molar.

Background: AH plus sealer has been widely used in dentistry as root canal sealer. In our case report the sealer had extruded beyond the mandibular second molar, close to the mandibular canal. Previous reports of paresthesia have been documented after extrusion of endodontic materials into mandibular canal. In our case, the extruded sealer has remained inert and the patient is asymptomatic.

Case Description: Three dimensional obturation of root canal determines the ultimate success of root canal treatment. While doing so the obturating material and the sealer should not extrude into the periapical region. Such an extrusion may cause irritation to the periapical tissues and lead to post operative pain. Despite taking precautions there may be accidental extrusion of sealer due to inadvertent instrumentation. The fate of such extruded sealer depends upon the type of the sealer. Here is one such case report involving accidental epoxy resin sealer extrusion which had remained inert over a follow-up period of three years.

Conclusion: The treatment outcome has not been affected by the extruded sealer since the root canals have been adequately obturated. AH plus has been well tolerated by the periapical tissues and the patient is asymptomatic for the past three years.

Clinical Significance: This case report shows that sealer extrusion cases show long term success rates if the root canals are adequately obturated and the extruded sealer is well tolerated by the periapical tissues.

Keywords: Sealer, AH plus, extrusion, periapical region, inert

Case Report

Introduction

The basic principles of endodontic treatment includes elimination of all diseased root canal contents, adequate cleaning and shaping, and a three dimensional obturation. Ideally, the obturating material and the sealer should be limited to the root canal and should not extrude into the periapical tissues. However, inadvertent instrumentation of the root canal can damage the apical constriction allowing not only the irrigating solutions,
medicaments and microorganisms but can also cause extrusion of sealers. Despite taking necessary precautions there are circumstances in which it is not possible to control limitation of the material to root canal, and some apical extrusion occurs. The fate of the extruded filling material will depend on its solubility in the tissue fluids and susceptibility to phagocytosis. Lower healing rate that are associated with overfillings is a result of the cytotoxicity of the root filling material. However, extrusion of sealer or gutta-percha does not have a direct correlation to treatment failure provided the periapical area is free of infection. Sealer extrusion has reported to cause symptoms such as pain, hyperesthesia and paraesthesia. Paraesthesia has been reported after the extrusion of endodontic materials into the mandibular canal when in contact with alveolar nerves as a result of the neurotoxicity of their components.

Among the root canal sealers AH-Plus represents the gold standard in clinical practice and the reference material for other types of sealers in laboratory and clinical research. Though AH-plus is biologically inert and has a good antimicrobial property it was found to be cytotoxic and not considered as biocompatible. While unintentional extrusion of zinc oxide and eugenol-based sealers gets completely removed over time, but removal of AH-Plus was significantly lower when compared with all the other sealers. The aim of this paper is to describe a case of an epoxy resin sealer (AH-Plus) extrusion in the periapical area during root canal treatment of a mandibular second molar without involving the mandibular canal which has remained inert but without any significant resorption over a period of three years.

Case Report:

A 45yr old female patient reported with the symptoms of decay and pain in the lower right back tooth region. The pain was intermittent and aggravated during sleep. There was no contributory medical history. On clinical examination, dental caries found in relation to 47. An intra oral periapical radiograph (IOPA) showed the involvement of the pulp with no periapical lesion.

Under rubber dam isolation, an access cavity was prepared and the working length was determined with #15 K files (MANI, Inc, Japan) using the apex locater (J Morita Root ZX mini, J Morita Corporation, Japan). The canals were cleaned and shaped using rotary ProTaper (Dentsply, Maillefer, Switzerland) from Sx to F2, with copious irrigation of 3% sodium hypochlorite and saline. The canals were then obturated with F2 gutta-percha (ProTaper Universal Gutta Percha points, Dentsply, China) using AH-plus (Dentsply, DeTrey, Konstanz, Germany) as the sealer. While coating the canals with the lentulo spirals -size 2, 21mm (Dentsply, Maillefer, Switzerland) there was accidental extrusion of AH plus sealer approximating the inferior alveolar canal, which was revealed in the post operative IOPA (Figure 1).

The patient was recalled after a week and he was asymptomatic and hence a crown preparation was done and a crown was placed. Subsequent recall of the patient was done after a month, 6 months, one year (Figure 2) and three years (Figure 3). There were no signs or symptoms due to the extrusion of the sealer, clearly stating that AH-plus sealer is inert and well tolerated by periapical tissues.
Discussion

André Schroeder developed the prototype of the first resin based sealer AH-26 (Dentsply DeTrey, Konstanz, Germany) in 1955. Though it is still available in the market, the sealer was replaced by AH-Plus in 1995. Setting time for AH-Plus varies between 492 min and 1440 min. The addition of nanoparticles is responsible for extending setting time by 5 minutes. The degree of radiopacity is an important factor, which controls the homogeneity of a root canal filling. AH-plus has very good radiopacity which can be appreciated on the radiograph. Flow is another important property which determines the quality of a sealer. According to American Dental Association (ADA) specification, a sealer should have a minimum flow of 20 mm/10 min or 17 mm/10 min, respectively. A high flow rate can increase the risk of apical extrusion which in turn can compromise apical healing and induce inflammatory reactions in the periapical tissues. AH-plus has been reported to have a film thickness of 8.0 to 43.65 micrometer(μm) which is accepted by the ANSI/ADA standards.

Low solubility and high dimensional stability are important properties required for a root canal filling material. High solubility of the sealer may result in small gaps and micro-leakages along the filling material, which in turn promotes ingress of bacteria. Dissolution of the sealer may also release components from the sealer which are responsible for irritation and inflammation of the periapical tissues. In a study by Borges et al, AH plus showed 3% weight loss.

The flow properties of a sealer are influenced by the viscosity of the material, temperature and humidity. According to Lacey et al, AH-Plus was the only sealer which showed no temperature dependent change in viscosity. AH-plus also shows good penetration into dentinal tubules. An ideal sealer should adhere well to the root canal wall and also to the gutta percha. Nunes et al concluded that AH-Plus had a significantly greater adhesion to dentine than Epiphany and that bond strength could be improved by a final irrigation with Sodium Hypochlorite (NaOCl) and Ethylene Di amine Tetra acetic Acid (EDTA). When calcium hydroxide is used as intra canal medicament, and if the remnants are not removed completely, it will negatively influence the adhesion of AH-plus.

AH-Plus is also known to have a good antibacterial effect against Enterococcus faecalis when freshly mixed, but there was no or only a minimal effect after a setting time of 48 hours. Biocompatibility of a root canal sealer is very important because of its close contact to the periapical tissues. Extrusion of filling material may induce periapical inflammation, delayed healing and also adversely affect the outcome of root canal treatment. In a study by Eldeniz AU et al, AH-Plus was severely cytotoxic in the freshly mixed state and slightly cytotoxic after 7 days on mouse fibroblasts but did not exert any cytotoxicity to human gingival fibroblasts. Some studies examined cytotoxicity of root canal sealers by measuring their effect on cytokine production. Brackett et al reported that there was no cytokine secretion after 12 weeks. Secretion of tumor necrosis factor α (TNFα) was measured 6 hours after mixing which completely disappeared in aged samples after 1 year. In our case, there was extrusion of AH-plus. Though the sealer had not been resorbed, the patient was asymptomatic on three years follow up. This proves that AH-plus is biocompatible and well tolerated by the periapical tissues.

Conclusion

In our case the amount of extruded sealer was substantially less and hence the patient has been asymptomatic. Treatment outcome is not significantly affected by the extruded sealer as long as the root canals are adequately treated. Success rates in overfilled
cases are significantly higher in teeth with no lesion in comparison with teeth with apical periodontitis. In our case there was no periapical lesion and prognosis was good. AH plus has been well tolerated by the tissues though it has not been resorbed.

Clinical significance:

Accidental extrusion of epoxy resin sealer did not cause any foreign body reaction. Though it has not been resorbed, it has been well tolerated by the periapical tissues and the patient has remained asymptomatic on three years follow up. This implies that sealer extrusion cases also show long term success rates if the root canals are adequately obturated.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Not required for case report.

References

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Effect of Composite Preheating on the Degree of Monomer Conversion, Polymerization Shrinkage and Micro Hardness of A Silorane based Composite-An In Vitro Study

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Abstract

Purpose: The aim of this in-vitro study was to evaluate the effect of pre-heating on the degree of monomer conversion, polymerization shrinkage and micro hardness of a silorane based composite.

Method: P90 low shrinkage composite was used for this study. A total of 30 samples were made and groups divided into A, B & C : Group A - the control group, Group B- the pre heated group, Group C - the pre cooled group. The degree of monomer conversion, polymerization shrinkage & micro hardness was measured using FTIR spectrometer, Stereomicroscope & Vickers hardness testing machine respectively. Statistical analysis was done using One way ANOVA and post hoc Dunnett test.

Results: The mean values for degree of conversion, polymerization shrinkage and microhardness for groups A, B, C were the following : 63.22%, 74.61%, 46.80%; 0.25%, 0.36%, 0.26%; 65.79 MPa, 72.69 MPa, 67.01 MPa respectively.

Conclusions: The silorane composite when pre heated there was a significant increase in the degree of conversion and microhardness. There was no significant difference in the polymerization shrinkage among the experimental groups.

Keywords:- Degree of monomer conversion, micro hardness, polymerization shrinkage, pre heated, pre cooling, silorane composites.

Introduction

Various advances have been made in the filler technology of composite resins to improve the wear resistance, decrease the water sorption and to provide a better surface finish. During polymerization, on exposure to visible blue light in the electromagnetic range (410-500nm) high molecular weight monomers are converted to highly cross linked, low molecular weight, long polymer chains. The major drawbacks of the existing composite resins were the unwarranted polymerization shrinkage. A major advancement in composite resin matrix occurred when Weinmann et al in 2005 [1] , discovered of a new monomer system Silorane (3, 4,-epoxy cyclo hexyl cyclo polymethyl siloxane). The term silorane represented the hybrid monomer system made up of siloxane and oxirane. The resin matrix silorane monomer has a siloxane core and along with four oxirane functional groups attached as side chains. This combination of siloxane and oxirane produces the biocompatible and low shrinkage silorane composite.
For a complete polymerization to occur, the percentage of monomer conversion should be high. Heating the composite resin under isothermal condition improves the degree of conversion and shortens the curing time to form a highly cross linked polymer chain with improved mechanical properties \[2\]. Therefore the purpose of this in-vitro study was to evaluate the effect of pre-heating on the degree of monomer conversion, polymerization shrinkage and micro hardness of a silorane based composite.

**Method**

A commercially available, photo activated silorane based composite P90 (3M ESPE, St. Paul, U.S.A, Shade A3), was used in this study\[1]\ . A total of 30 cylindrical specimens, with specific dimensions of about 5x2 mm (5mm-wide and 2mm-height) was fabricated using a brass mould for the standardization of the samples. This mould was constructed as two parts with a split in between for easy disassembly of the cured specimen. The whole assembly was made to rest in the brass block, with four corner slots for additional support. The inner surface of the jig was polished to prevent adhesion of composite resin to the mould. Composite material was placed as a single increment within the brass mould and well adapted. A thin mylar strip was placed over the material and digital pressure was applied to ensure the composite was tightly adapted to the walls \[4\] . Light polymerization was performed with quartz-tungsten-halogen light curing unit (Elipar 2500- 3M ESPE, St. Paul, MN, USA) for 20 seconds at 600 mW/cm\(^2\) and periodical monitoring of the curing light intensity was done with radiometer (Optilux Model 100, SDS Kerr; Donbury, CT, USA) according to the manufacturers’ recommendations.

**GROUP A:**

This is the control group (n=10), without any pre-heating or pre-cooling the composite was kept at room temperature.

**GROUP B:**

For preparing the samples (n=10), composite was placed in the digital electric oven and maintained at 68\(^\circ\)C. The required amount of composite was then dispensed into the brass mould and immediately carried to the spectrometer and spectra were obtained. Care was taken to maintain the duration of transferring the specimen from the oven and recording the spectra to be less than 40 seconds to prevent the heat loss.

**GROUP C:**

All the samples in this group (n=10) were prepared by cooling the composite material in a digital weatherometer, which was maintained at 10\(^\circ\)C.

**MEASUREMENT OF DEGREE OF CONVERSION (DOC):**

The DOC was analyzed using Fourier Transformation Infrared Raman (FTIR) spectrometer (Thermo Scientific Inc., Waltham, USA). The infra red spectra were collected with 128 scans at the range of 4000 cm\(^{-1}\). Based on the absorbance frequencies, the percentage of un-reacted C=C (aliphatic) converted to C-C (aromatic) was calculated by using the formula below and the results were tabulated [Table 1]. Post irradiation spectra were obtained after 24 hours \[5\].

\[
\text{DOC} \% = \left\{ 1 - \frac{[C_{\text{aliphatic}}]}{[C_{\text{aromatic}}]} \right\} \times 100
\]

**MEASUREMENT OF POLYMERIZATION SHRINKAGE:**

The calculation of Polymerization shrinkage was measured after 24hrs using stereomicroscope (HZ CS02-700X, Olympus, Japan). The readings obtained at eight different places and the average was calculated. Shrinkage was calculated by measuring the difference between the standard diameter of the mould and the diameter of the specimen at 24 hours after polymerization. The percentage of polymerization shrinkage was calculated using the formula and the mean values tabulated [Table 1] \[6\]:

\[
\% \text{ of shrinkage} = \frac{\text{diameter of the sample}}{\text{Standard diameter of the mould}} \times 100
\]

**MEASUREMENT OF MICRO HARDNESS:**

Vickers micro hardness test with micro duromax 4000E (Richard Polyver 2 MET) was performed for all the experimental samples in this study. A
total number of 5 indentations were made on the irradiated surface and the mean values were noted on Table 1.

Statistical analysis was done using statistical package of social sciences (SPSS) version 10.0 and the data were analyzed using one way analysis of variance (ANOVA) and the multiple comparisons between the experimental groups were done with post hoc-Dunnett test. A probability value less than 0.05 was considered to be statistically significant (P < 0.05) [Table 2].

\[
\left\{ 1 - \left[ \frac{C_{\text{aliphatic}}}{C_{\text{aromatic}}} / \frac{U_{\text{aliphatic}}}{U_{\text{aromatic}}} \right] \right\} \times 100
\]

Results

Regarding the results obtained for polymerization shrinkage, there was no statistically significant difference among the experimental groups. The mean values were 0.25%, 0.36%, 0.26% for the three experimental groups represented in the bar graph [Figure 1].

The results represented by the bar diagram showed [Figure 2], the mean percentage of the degree of monomer conversion with the heating group showing the maximum conversion. The mean values were as follows for the experimental groups A, B, C – 63.22%, 74.61%, 46.80% respectively. The DOC values were calculated by FTIR spectra [Figure 3].

There was a statistically significant difference in the Vickers hardness values of the pre heated group (group B) compared to the other two experimental groups. The pre heated group showed an increase in the micro hardness (72.69 MPa) compared to the control (65.79 MPa) and the pre cooled group (67.01 MPa) [Figure 2 & 4].

Table I – Mean values

<table>
<thead>
<tr>
<th>Groups</th>
<th>Degree of monomer conversion (%)</th>
<th>Polymerization shrinkage (%)</th>
<th>Microhardness (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>63.22</td>
<td>0.25</td>
<td>65.79</td>
</tr>
<tr>
<td>Pre heated</td>
<td>74.61</td>
<td>0.36</td>
<td>72.69</td>
</tr>
<tr>
<td>Pre cooled</td>
<td>46.80</td>
<td>0.26</td>
<td>67.01</td>
</tr>
</tbody>
</table>

Table II – Statistical analysis- Post hoc test- Dunnett test- Multiple comparison between the control and the experimental groups (P value)

<table>
<thead>
<tr>
<th>Experimental groups</th>
<th>Control</th>
<th>Degree of conversion</th>
<th>Polymerization shrinkage</th>
<th>Microhardness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean difference</td>
<td>P value</td>
<td>Mean difference</td>
</tr>
<tr>
<td>Group B- Pre heated</td>
<td>-11.39</td>
<td>0.000*</td>
<td>-0.11</td>
<td>0.194</td>
</tr>
<tr>
<td>Group C- Pre cooled</td>
<td>16.42</td>
<td>0.000*</td>
<td>-0.01</td>
<td>0.986</td>
</tr>
</tbody>
</table>

Probability value (P value) < 0.05 is statistically significant; * Statistically significant
Discussion

To overcome the polymerization shrinkage in dental composites, nano-composites were introduced which contain high filler content (80 to 90% of resin matrix) resulting in reduced polymerization shrinkage, high viscosity and stickiness of the material which makes the insertion, adaptation more difficult and also yielding lower conversion rate\(^8\). To overcome all these drawbacks, studies have shown that the process of chair-side pre-heating of composite prior to the polymerization process significantly increases the free radical reactivity, reduces the viscosity thus increasing the flow enabling superior adaptation of the composite to the cavity walls. Pre-heating of composite resin also reduces the percentage of un reacted residual monomer by leading to increase in the degree of monomer conversion and increase in the rate of polymerization reaction.

Polymerization of siloranes composite used in this study occurs via a cationic ring opening reaction which results in low polymerization contraction compared to the methacrylate based resins. The cationic cure starts with activation of the initiator (camphorquinone, an electron donor, an acidic cation) which opens the oxirane ring and generates a new acidic centre. After the subsequent attraction to a new oxirane monomer, the epoxy ring is opened to form a chain or in the case of interaction among multiple monomers, a network is formed. This process gains space and counteracts the volume loss that occurs when the chemical bonds are formed, thus leading to a reduced volumetric shrinkage. This cationic ring opening reaction has three components-camphorquinone, iodonium salt and electron donor. In this redox reaction the electron donor decomposes the iodonium salt to an acidic cation which starts the ring opening polymerization process\(^1,9\).

The clinical success of composites depends on various material characteristics like polymerization shrinkage, depth of cure and mechanical properties. Handling characteristics like paste viscosity, packability, stickiness and polishing play a role. Recently preheating of composite resins has been advocated to reduce paste viscosity which in turn improves the marginal adaptation, monomer conversion and decreases the curing time. Pre cooling the composite resin prior to curing initially results in contraction of the resin matrix and expansion of the matrix occurs as it returns to room temperature when placed in the mould cavity before curing. This expansion
masks the underlying shrinkage in the mould cavity and further counteracts the polymerization shrinkage stress [10-14]. As there are few studies in literature evaluating the influence of temperature on the mechanical properties of silorane composites, hence the purpose of this study was to evaluate the effect of pre-heating and pre-cooling prior to the photopolymerization on the degree of conversion, polymerization shrinkage and microhardness of a silorane based composite.

According to the results obtained, group B (pre-heated group) exhibited increase in the DOC and microhardness compared to group A (control- room temperature) and group C (pre-cooled group). The elevation in temperature, increases free radical mobility, greater monomer cross linking and increases the rate of polymerization leading to the rise in the degree of monomer conversion. The process of pre-heating of the composite improves the mechanical properties with greater strength, rigidity and better wear resistance to degradation in the oral cavity [14].

Hardness of composites is directly proportional to the amount of polymer cross linking and the depth of cure of the material. The higher microhardness value of the pre heated group is characterized by the enhanced polymer cross-linking and greater degree of conversion than light curing at room temperature. Moreover, Eliades and his colleagues suggested that higher microhardness values are related to the higher inorganic filler loading in the silorane composite. The increase in the microhardness enables the material to withstand masticatory forces, resist fracture and wear [12,14].

According to Daronch and his colleagues it was estimated that when composite is pre-heated upto 60°C and removed from the heating device, there is a temperature loss by 50% after 2 min and 90% after 5 min. Hence in the current study care was taken to reduce the transfer time (the mean time between removing the composite from the heating device, placement into the brass mould and light polymerization) to 40 secs to minimize the negative effect of heat loss. Daronch and his researchers also stated that pre heated composites reduces the light exposure time upto 75% resulting in better monomer conversion and thereby reducing the curing time [2].

The results showed that there was a reduced polymerization in all the three experimental groups with no statistically significant difference between the groups. This can be attributed to the cationic ring opening polymerization of the silorane composite. This clinical study also proved that pre heating or pre- cooling of the silorane composite does not affect the polymerization shrinkage. But according to the values obtained high shrinkage was found in the pre-heated group followed by the room temperature group this could be attributed to the fact that as the reaction rate increases there will be an increase in the stresses produced resulting in higher volumetric shrinkage. The pre cooled group was found to have lowest shrinkage values due to the fact that refrigerated composite samples were smaller than the room temperature samples as the temperature increases they slowly expand which could mask the underlying polymerization shrinkage [15].

**Conclusion**

Therefore, within the limitations of this study, it can be concluded that,

- The silorane based composite when pre-heated there was a significant increase in the degree of monomer conversion (74.61%) and microhardness (72.69 MPa) when compared to the pre cooled and room temperature groups.
- Regarding the polymerization shrinkage of the silorane composite there was no significant difference between the experimental groups.
- The process of chairside pre-heating significantly improves the mechanical properties of siloranes.

**Conflict of Interest:** Nil

**Source of Funding:** Self

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**References**


Resistance Mechanism of Enterococcus Faecalis – A Review

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Abstract

Enterococci are normal commensals of humans that can survive extreme environmental challenge and it is partly shielded from the defense mechanisms of the body. The virulence factors of E. faecalis that may be related to endodontic infection and the periradicular inflammatory response and a large part of the tissue damage is probably mediated by the host response to the bacterium and its products

Keywords: Enterococcus faecalis, virulence factors, root canal infection

Introduction

Enterococci are normal commensals and can cause a wide variety of diseases (Jett et al., 1994)¹. Enterococcus faecalis has the ability to resist harsh environmental conditions such as pH by potassium proton pump mechanism(Evans et al., 2002)³, antimicrobial effect of calcium hydroxide(Byström et al., 1985; Distel et al., 2002)³, starvation. In addition to that with the help of various virulence factors Enterococcus faecalis has the ability to resist the host defense mechanism. E. faecalis, moreover, can enter the viable but non-cultivable (VBNC) state during unfavourable environmental condition and return back to normal after the condition becomes favourable (Lleò et al., 2001)⁶

Resistance To pH by Proton Pump:

Proton pump functions by controlled transport of cations across the cell membrane (Booth et al)⁹. Enterococcus faecalis survives in alkaline /acidic pH due to the existence working potassium /proton antiport system. In alkaline pH Cations/protons gets pumped into the cell to lower the internal pH thus making the bacteria favourable for survival against medicaments inside the root canal. In the acidic pH a cation antiport system raise the internal pH by expelling protons across the cell wall and thus maintaining pH homeostasis. Calcium hydroxide seems to be ineffective at killing Enterococcus faecalis because of the effective proton pump mechanism. Calcium hydroxide is used as an intracanal medicament has a pH OF 12.5 and it cleaves into Ca⁺⁺ and OH⁻ when negatively charged ions penetrate the bacterial cytoplasm elevating the pH the proton pump derives the positively charged k⁺ ions into the cells to acidify the cytoplasm. At pH 11.5 - Enterococcus faecalis unable to survive. As a result of buffering capacity of dentin it is unlikely that a pH of 11.5 can be maintained in dentinal tubules with calcium hydroxide sterilization techniques.

Starvation Resistance:

Enterococcus faecalis survives even under starvation when compared to other microorganisms and it remains dormant until favourable conditions becomes available. Hyaluronidase supply nutrients for the bacteria since the product disaacharides are transported and metabolized intracellularly by bacteria(Hynes and Walton 2000)³. Enterococcus faecalis may also feed on serum components present in the fluid in the dentinal tubules and it has the ability to survive without nutrient supply inside the root canal.

Aggregation Substance

Enterococcus faecalis with the help of this virulence factor binds to the extracellular matrix protein including type 1 collagen which is the main organic component of dentin (Lindhe & Goldberg)⁸. It serves as the protective factor against host defence mechanism by promoting oposonin independent adherence. They cause
phagocytosis of Enterococcus faecalis by macrophages and thus promoting its intercellular survival time. Aggregation substance gets binded to possess superantigen activity (Schlievert et al)\(^9\) Fig 1. These molecules cause inflammation by stimulating the T lymphocytes and thus leading to the release of massive number of cytokines (inflammatory mediators) causing tissue damage. Inflammatory mediators such as IL-6, IL-8, TNF alpha, IL-1beta have tissue damaging property.

**SEX PHEROMONES**

Sex pheromones function as signalling peptides for Enterococcus faecalis. Plasmid transfer by conjugation takes place by sex pheromone system (Clewell and Weaver et al)\(^10\). Thus the recipient strain secretes the plasmid into the medium which the sex pheromone does not carry and the donor strain producing the AS adhesion helps in the conjugal transfer of the plasmids which is being replicated once the copy is acquired the recipient strain stops producing that particular pheromone and they continue to secrete sex pheromones for other plasmids and the process is continued (Fig 1). In addition to it sex pheromone also contributes to the bone resorption (Torabinejad et al)\(^11\).

**LIPOTEICHOIC ACID**

Lipoteichoic acid is present on the cell surfaces of bacteria. (Wicken and Knox)\(^12\). They are amphipathic molecules that bind to eukaryotic cells with the help of its lipidic moiety and it stimulate the release of inflammatory mediators causing tissue damage to the host. (Fig 1) LTA is a constituent of the binding substance of the bacteria and it act as a receptor on the cell for the aggregation substance (AS).

**EXTRACELLULAR SUPEROXIDE PRODUCTION**

Superoxide anion is an oxygen radical which is highly reactive and causes inflammation. Superoxide anion are produced by both host cells and bacteria and it causes tissue damage (Fig 1). Thus superoxide anion is able to kill the microorganisms by phagocytosis and on the other way the bacteria with the help of this superoxide anion causes lytic of erythrocytes.

**GELATINASE**

It is an extracellular zinc containing metalloproteinase from Enterococcus faecalis (Bleweis and Zimmerman)\(^13\). As gelatinase belongs to MMP family it is produced by inflammatory cells, fibroblasts, osteoclasts. Host gelatinaase helps in regulating and remodelling the tissues (Fig 1). They are highly present in inflamed pulp than healthy tissues and also has the effect of degrading the dentin organic matrix. (Tjaderhane et al)\(^14\) Gelatinase causes the disease to be progressed due to its cytotoxic and tissue destructive potential.

**BACTERIOCINS**

Cytolysin, AS – 48, BC- 48 have been isolated from strains of Enterococcus faecalis and have been reported to have inhibitory action on gram positive action.

**Conclusion**

Enterococcus faecalis with the help of virulence factors it has the ability to adhere to the cell, colonize, invade the host and cause damage .Thus it has the quality to face stressful conditions inside the root canal when compared to other microorganisms present in the canal. Enterococcus faecalis has the potential to cause infection of root canal and by penetrating deep into the dentinal tubules leading to periodontal inflammation.
Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Not required for review manuscript.

References


Bonding System for Restorative Materials – A Review

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Abstract

The acid-etch technique for bonding composite resins to enamel has revolutionized the practice of restorative dentistry. Although bonding resins to dentin has proved to be a difficult challenge. Ongoing advances have improved the reliability and predictability of dentinal adhesion.

Keywords :- Composite resin, acid etching, bonding, adhesives.

Introduction

The revolutionary work of Michael Buonocore nearly 50 years past marked the beginning of successful ‘adhesive’ dentistry. Buonocore was able to demonstrate that the treatment of enamel with phosphoric acid resulted in a porous surface, which could be infiltrated by resin, to generate a strong micromechanical bond. However, the clinical application of acid etching was not realized until 15 years soon after when resin composites became available as a result of the work of Bowen’s group. In contrast to micromechanical bonding to tooth tissue, chemical bonding was developed by Smith and resulted in the introduction of polycarboxylate cement.

Enamel etching

Buonocore reported in 1955 that acid, can be used to modify the surface of enamel to “render it more receptive to adhesion.”¹ It was revealed that acrylic resin could be bonded to human enamel after conditioning with 85% phosphoric acid. Buonocore predicted many potential uses for this technique, including Class III and Class V restorations and pit and fissure sealants. Most of the enamel etchants contain 30-40% phosphoric acid and produce shear bond strengths of composite resin to enamel of about 20 MPa.²

Development of resin/ dental adhesives

Although advance of dentin adhesives began in the early 1950s³,⁴,⁵ steps forward was very slow until recent years. In the early 1960s, Bowens synthesized a “surface-active comonomer” that could apparently mediate water-resistant chemical bonds of resins to dentinal calcium.⁶ However, marketable products based on this comonomer showed very reduced clinical performance.⁷

A “second generation” of dentin bonding agents was developed for clinical near the beginning of 1980s. With the exemption of ScotchbondTM Dual-Cure (3M Dent al Products Division, St. Paul, MN)and Bondlite (Kerr Corporation, Glendora, CA), second-generation bonding agents are no longer obtainable. Nearly all of these materials were halophosphorous esters of unfilled resins.

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such as Bis-GMA (bisphenol A-glycidyl methacrylate) or HEMA (hydroxyethyl methacrylate).3

They bonded to dentin through improved surface wetting and ionic communication between the phosphate groups and calcium in the smear layer. These agent had shear dentin bond strengths of only about 1-10 MPa, 9,10,11 which was too weak to counteract the polymerization shrinkage of composite resin. Therefore, composite usually separated from dentin, forming marginal gaps that permitted microleakage.

The experimental performance of phosphonate esters used without enamel etching or mechanical maintenance was poor, with quite elevated percentages of cervical restoration failure over 1- to 3-year evaluation periods.12-17

Third-generation adhesives were introduced in the United States in the late 1980s. These systems removed the smear layer to permit resin penetration into the underlying dentin 15 Shear dentin bond strengths of agents such as Scotchbond 2 (3M), Gluma, Tenure (DenMat Corporation, Santa Maria, CA), Prisma Universal Bond 3, Syntac and XR-Bond (Kerr) were typically greater than those of the second-generation agents. Though their performance was still unpredictable, even in laboratory studies. Although these dentin adhesives were more efficient than their predecessors in reducing microleakage at dentin and cementum margins18,19 they did not eliminate marginal leakage20,21 These systems provided better retention rates and marginal integrity than earlier adhesives22,23

Fourth-generation adhesives

The consequent generation of dentin bonding systems appeared in the early 1990s and is still extensively used. Most of these systems are based on the “total-etch” technique, or concurrent etching of enamel and dentin, typically with phosphoric acid. Development in dentin bond strengths by etching was first established by Fusayama in 197924,25 but the concept of total-etching25 only recently gained acceptance in the United States. Etching of dentin traditionally was discouraged because facts from previous studies seemed to show that phosphoric acid etching of dentin caused pulpal inflammation.26,27 However, very little acid in fact penetrates dentin, so it seems unlikely that the acid is directly responsible for nearly all pulpal damage.28 Much data now indicates that lack of an adequate marginal seal is the major cause of pulpal inflammation associated with permanent restorations. Slight or no inflammation may happen if restorations are sealed well enough to prevent bacterial invasion of the pulp.29,30

The bonding mechanism of the fourth-generation adhesive systems is a three-step process: (1) condition, (2) prime, and (3) bond. Conditioning (or etching) removes the smear layer, opening the dentinal tubules, increasing dentin permeability, and decalcifies the intertubular and peritubular dentin. Elimination of hydroxyapatite crystals leaves a collagen meshwork that can shrink due to the loss of organic support. After the conditioner is rinsed off, a primer consisting of a solvent with one or more hydrophilic resin monomers is functional. Primer molecules contain two functional groups—a hydrophilic group and a hydrophobic group. The hydrophilic group has a likeness for the dentin surface and the hydrophobic (methacrylate) group has an likeness for resin. The primer wets and penetrates the collagen meshwork raise it about to its original level. The primer also raises the surface energy, and thus the wettability of the dentin surface. Unfilled resin is functional and penetrates into the primed dentin, copolymerizing with the primer to outline an intermingled layer of collagen and resin frequently termed the “hybrid layer”.28 Improvement of this hybrid layer of dentin and resin, which was described by Nakabayashi et al. in 198229 is thought to be the primary "bonding mechanism of most adhesive systems. Many investigators have reported shear bond strengths for these materials that advance or exceed the typical enamel bond strength of 20 MPa.

Fifth-generation dentinal adhesives

For the reason that the three-step bonding systems are perceive by some as being too complicated and time-consuming, manufacturers have attempted to shorten systems by combining certain steps. The common means of simplification is mixture of the primer and bonding-agent steps to make “one-bottle adhesives”.28,29,30

Various one-bottle adhesives are now presented, including Prime & Bond 2.1, One-Step, OptiBond Solo (Kerr), Single Bond (3M), and Tenure Quik with Fluoride. They require conditioning of enamel and dentin before applying of the primer/adhesive, and nearly all necessitate two or more applications of the latter. Considering the fact that these materials are promoted
as “simplified” systems, bond strengths reported for the one-bottle adhesives have been disconcertingly variable. Some investigators have reported values similar to those of conventional three-step systems while others have reported lower values. Much of the variation in bond strengths may be due to technique factors. The acetone-based systems in particular show to call for a dentin surface that is neither too moist nor too dry.30

Bond strengths

Much of the dental materials literature, bonding systems have been compared by their shear bond strengths. However it must be well-known that laboratory bond strengths do not openly predict clinical performance. In a typical test, extracted human or bovine teeth are ground flat, an adhesive system is applied, and a composite resin post is bonded to the surface. A loading force is useful to shear or draw the composite from dentin. Laboratory tests generally ignore the special effects of polymerization shrinkage, pulpal pressure, dentinal fluid, and tooth flexure. Bond strength testing is not entirely without value, yet--as more and more data are generated by various laboratories, a rough rank order of adhesives is possible and provide a sound basis for predicting clinical performance 31, 32

A current study of fourth-generation dentin adhesives reported bond strengths to primary dentin between 9.9 to 17.9 MPa 32

Clinical factors in dentin bonding

A number of clinical factors influence the longevity of bonded composite restorations. A list of guidelines to help ensure clinical success and durability follows:

Use proper isolation. Hydrophilic bonding systems may tolerate saliva contamination to a certain degree. However, evidence for such tolerance remains minimal and the mechanism is not well understood, so proper isolation using rubber dams or alternative methods is considered essential to clinical success with current adhesive systems.

Bond to enamel. Every time a restoration is bonded to dentin, the adjacent enamel should be etched. Years of experience have proved that enamel etching is a very consistent method of bonding resins to tooth structure. In addition, when bevels are used, they offer a gradual transition of composite material onto the tooth and thus a better esthetic result.

Roughen sclerotic dentin. Bonded restorations are further likely to fail when they are bonded to highly sclerotic dentin) Light roughening by means of a diamond or carbide bur may provide more micromechanical locking between resin and dentin. While not encountered as often in pediatric dentistry as in adult restorative dentistry, sclerotic dentin is encountered beneath some carious lesions.

Use mechanical retention. With adhesive restorative materials, supplemental mechanical retention (pins, grooves, slots) is often not essential However, the operator should use mechanical retention in cases where adhesive bonding may not be adequate to retain or properly seal a restoration.

Current dentin adhesives bond to dentin that is at least slightly moist. Systems that contain acetone primers are predominantly well suited for bonding to wet surfaces 32 although the optimum degree of surface moistness varies with specific products. However as a general rule, dentin should not be desiccated. If dentin is dried excessively to check the enamel etch, it should be moistened to improve bond strengths. The “moist bonding” technique is used because desiccation of etched dentin can effect collapse of the unsupported collagen network, inhibiting adequate wetting and penetration by the primer or primer/adhesive. On the other hand, the clinician must be aware that pooled moisture should not be allowed to continue on the tooth, as excess water can dilute the material and reduce its effectiveness. A glistening, hydrated surface is the ideal appearance.

Apply and dry primers correctly. Dentin primers and fifth-generation primer/adhesives must be applied in adequate quantity. Some materials require multiple coats, and others probably benefit from application of multiple coats or longer application times. Also, solvents must be driven off completely with compressed air before the bonding agent or composite is applied.

Do not over-thin the bonding resin. Relevance of the resin bonding agent is the simplest step in a three-step bonding sequence. However, if the resin is aggressively air-thinned, oxygen inhibition prevents complete polymerization and results in lower bond strengths. Thinning the bonding agent with a dry brush is better than thinning with compressed air blasts. 33 For direct composite restorations, the bonding agent should be light-cured before the restorative material is placed to
optimize the bonding system’s performance.

Use a flexible restorative system. Flexible restorative materials (e.g., microfill composites) and “stress-breaking liners” (filled bonding resins) may advance the marginal quality of bonded restorations by compensating for stresses generated by polymerization shrinkage and tooth flexure.14,15

Fill incrementally. All composites shrink during polymerization. One means of reducing overall polymerization shrinkage is to place and cure composite in increments. Although there is now some controversy about whether this technique provides better marginal adaptation it still seems advisable, and is necessary when composite thickness exceeds 2 mm (to provide for adequate light curing).

Delay finishing. The bond strength of resin to enamel and dentin is greater at 24 h than immediately after placement. Some of this improvement in bond strength actually occurs within the first few minutes, so a brief delay in finishing may help to preserve the integrity of delicate margins.

“Rebond” margins. The concept of rebonding is based on the assumption that gaps are likely to occur in at least some marginal areas of any direct composite restoration. The margins are re-etched and sealed with special low-viscosity resin.16,17

**Conclusion**

Advances in adhesive dental technology have changed restorative dentistry. The acid-etch technique for enamel bonding led to the development of revolutionary restorative, preventive, and esthetic treatment methods. More recently, developments in resin/dentin bonding have moved adhesive dentistry an even higher level. Many systems are now available to reliably and durably bond resin to dentin. However, these systems must be used properly to optimize their clinical performance.

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Type of article: Review

Review on Inhibition of Osteoclastic Activity by Mineral Trioxide Aggregate (MTA)

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Abstract

Mineral trioxide aggregate (MTA) is a calcium silicate-based cement which has a unique property in remodelling the bone. It is commonly used as a repair material in endodontics and has various clinical applications. It can initiate the osteoblasts to cause bone formation and has been proved in various articles. MTA causes an increase in the production of interleukin (IL)-1α, IL-1β, IL-6 and osteocalcin. IL-1α and IL-1 β interact with receptors on osteoblasts which in turn activate osteoclast. Osteocalcin is an abundant protein, present in the bone and acts as an indicator of bone matrix production. There are certain studies suggesting that MTA can inhibit osteoclastic activity. Osteoclasts which are multinucleated giant cells, differentiate from myeloid precursors via cytokines Macrophage colony stimulating factor (MCSF) and Receptor activator of nuclear factor kappa-β ligand (RANKL) supplied by osteoblasts and/or osteocytes. MCSF and RANKL are critical cytokines that contribute to the differentiation and function of osteoclasts. However, the underlying reason behind MTA showing inhibition of osteoclastic activity remains unclear. The purpose of the review is to present a comprehensive opinion of articles on action of MTA on osteoclasts.

Keywords: Mineral trioxide aggregate, osteoclast, bone resorption, RANKL

History

MTA is a commonly used material in conservative and endodontic dentistry. This material was introduced as an experimental material by Professor Mahmoud Torabinejad at the Loma Linda University, California in the year 1993. The main goal behind introducing MTA was to eliminate any communication between interior and exterior of the tooth. Hence, it became a material of choice in cases of intraradicular or furcation perforations and in cases of root end filling.

Earlier Gray MTA (GMTA) was available in the market. It was in the year 2002, White MTA (WMTA) was introduced to overcome the discoloration and esthetic problems caused by GMTA. Thus, MTA can be classified into GMTA and WMTA.

In the year 1993, when MTA was first described in the dental scientific literature. In 1998, it was approved for endodontic use by the US Food and Drug Administration. In the year 1999, it was commercially available as ProRoot MTA (Dentsply Tulsa).

Clinical Applications

It is used as an apical barrier in teeth with immature apices, repair of root perforations, root-end filling,
capping, and pulpotomy. It has an excellent property to regulate bone remodelling.

**COMPOSITION**

- Tricalcium silicate
- Dicalcium silicate
- Calcium sulfate
- Tricalcium aluminate
- Tetra calcium alumina ferrite
- Bismuth oxide.

**ACTION OF MTA IN THE CELLULAR LEVEL**

MTA enhances the proliferation of gingival fibroblasts, dental pulp cells, periodontal ligament cells, and osteoblasts better than other commonly used retrofilling materials, such as amalgam, Super-EBA, and intermediate restorative material (IRM). MTA also enhances the induction of osteoblast attachment and spreading and induces differentiation and mineralization of osteoblasts. It has been well-established that MTA extracts containing calcium and silica ions inhibit osteoclastogenesis and bone resorption to promote bone reconstruction.

**ABOUT OSTEOCLASTS**

Osteoclasts (OCLs) are multinucleated giant cells that derive from a hematopoietic monocyte or macrophage lineage.

Osteoclastic bone resorption takes place in various steps which are: proliferation of osteoclast progenitors, differentiation of progenitors into multinucleated osteoclasts, and apoptosis as well as clear zone (actin ring) and ruffled border formation (activation). Four proteins crucial for osteoclast development and activation are macrophage colony-stimulating factor (M-CSF), the receptor activator of NF-κB ligand (RANKL), its receptor (RANK), and its decoy receptor osteoprotegerin (OPG). The RANKL/RANK signalling pathway activates osteoclastic bone resorption and regulates osteoclast differentiation from monocyte/macrophage progenitors together with macrophage colonystimulating factor (M-CSF) in vitro and the addition of OPG into these culture systems prevents osteoclast formation. It is therefore believed that the balance of RANKL and OPG expression is critical for regulating osteoclast differentiation and function.

**OSTEOCLASTIC ACTIVITY OF MTA**

Certain studies were conducted to find the relation between MTA and osteoclastic inhibition. One among them is the study conducted by Daisuke Hashiguchi et al. In his study he made efforts to hypothesize that MTA stimulates bone formation not only by stimulating osteoblast activity but also by decreasing osteoclast number. The study also included the cellular and molecular mechanisms by which MTA inhibits osteoclast differentiation. Mouse cultures were used to check osteoclastic inhibition by MTA. It was found that MTA solution did not inhibit RANKL-induced osteoclastogenesis, proving that Primary osteoblastic cells (POBs) are targets of MTA. MTA solution suppressed the 1α,25-dihydroxyvitamin D3 which caused reduction of osteoprotegerin (OPG) mRNA and protein in POBs. MTA solution did not inhibit osteoclastogenesis in cocultures of bone marrow cells (BMCs) and POBs from OPG-deficient mice. It was found that MTA solution dose-dependently inhibited osteoclast formation in cocultures. It has been reported that the values of calcium ion release from freshly mixed MTA were higher during the first 3 hours and tended to subsequently decrease. Thus, it was hypothesized that the release of calcium ions from MTA would inhibit osteoclast formation in cocultures. However, the addition of exogenous calcium chloride as a source of calcium ions to the culture medium in the absence of MTA solution did not inhibit osteoclast formation in cocultures. Furthermore, the increased calcium concentration in the supernatant medium induces osteoclast formation in cocultures, indicating that the inhibitory effects of MTA solution do not depend on the calcium ion concentration of the culture medium. MTA solution inhibits osteoclast formation in cocultures induced by 1α,25(OH)2D3, but not in RANKL-induced osteoclastogenesis, suggesting that the target cells of MTA are POBs.
In another study by Daisuke Hashiguchi et al in 2011,[22] further evaluated inhibition of bone resorption by MTA. It was found that 20% MTA reduced the resorbed area made by osteoclasts without affecting osteoclast numbers. In contrast, a high concentration (50%) of MTA solution strongly inhibited osteoclastic bone resorption and there was reduction in Tartrate-resistant acid phosphatase (TRAP), a marker enzyme of osteoclasts. F-actin dots (actin rings) are ringed structures that are commonly associated with bone-resorbing activity of osteoclasts. In the study, control cultures with complete and well-defined actin rings were observed, whereas ring formation was reduced in the presence of MTA solutions. The study also included c-Src kinase activity which increases the osteoclastic bone-resorbing activity. Hence, it was examined whether MTA solution affects the tyrosine phosphorylation and tyrosine kinase activity of c-Src. Phosphorylation of Tyr416 was stimulated after treatment with RANKL for 10 min but 20% MTA solution significantly suppressed RANKL-induced c-Src phosphorylation. Furthermore, mRNA expression levels of cathepsin K and mmp-9, boneresorption mediated genes, were analyzed by real-time PCR, and expression of these mRNAs was reduced by MTA solution. The study also showed that MTA caused apoptosis of purified osteoclasts within 18 hours. Along with apoptosis of purified osteoclasts, disrupted actin ring formation was also seen with 20% MTA solution. There was reduction in the number of purified osteoclasts when 50% MTA solution was used. Nuclear condensation, a typical phenomenon in apoptosis, was also observed in the presence of 50% MTA, which indicates that 50% MTA solution induced apoptosis in mature osteoclasts. The study also analysed relation between Bim, a pro-apoptotic protein and MTA with the help of Western blot technique.

In a study by Cheng X et al[23] demonstrated that MTA suppressed RANKL and autophagic marker protein LC3-II, which are often involved in osteoclastogenesis. To validate whether MTA directly affects autophagyMDC staining, western blot analysis and ultrastructural analysis were carried out. This proved that MTA has a significant role in autophagy inhibition. Autophagy inhibition by MTA was pharmacologically activated by using rapamycin, an autophagy activator[24], to check for the potential role of the autophagic pathway in MTA mediated anti-osteoclastogenic activity. This explained that MTA directly inhibits autophagy activity, and rapamycin reversed the low-level autophagy activity inhibited by MTA.

A study by Miri kim et al suggests that MTA show an inhibitory effect on Osteoclast differentiation and function similar to alendronate, a bisphosphonate with increased anti-resorptive property. According to the study it occurs via inhibition of Extracellular signal Regulated Kinase (ERK) signalling pathways and IκB phosphorylation.[25]

**Conclusion**

From this article it can be concluded that MTA shows a significant action on osteoclastic inhibition and retards bone resorption. Further studies are still required to support the effect of MTA on inhibition of bone resorption by osteoblasts.

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**References**


Type of article: Review

Application of Silver Nanoparticles in Conservative and Endodontics

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Abstract

With the advent of nanotechnology, silver finds its applications in various domains - pharmacological research, clinical diagnosis, immunostimulant moderator, tumor destruction etc. With mounting advances in the field of nanotechnology, silver occupies a significant position in bio-nanomedical applications. More recently various formulations of silver nanoparticles (AgNP) have been synthesized and incorporated for treatment, therapeutic and prophylactic purposes which offer better patient compliance. Because of its greater surface area and small particle size, they possess excellent anti-microbial properties without affecting the mechanical properties of the material. This review highlights the synthesis, mechanism of applications of silver nanoparticles in Conservative Dentistry and Endodontics.

Key words: Silver nanoparticle, biofilm, nanodentistry, anti-microbial efficacy.

Introduction

Silver nanoparticles (AgNP) are microscopic particles with at least one dimension less than 100nm. They are larger than atoms and molecules but smaller than bulk solid. Due to their large surface area more atoms come in contact with the reactant providing better bioavailability and anti-microbial action without altering the mechanical properties of the material(1). It has low bacterial resistance, long term antibacterial and antifungal action (2) and is widely used in medical field for sterilization of wound sutures, endotracheal tubes, surgical instruments, bone prosthesis etc. For biofilms that are resistant to antimicrobial agents, AgNPs penetrates the cell membrane and causes the death of microbes (3). With mounting advances in the field of nanotechnology, silver occupies a significant position for a gamut of bio-nanomedical applications. More recently various formulations of AgNPs have been synthesized and incorporated in dentistry due to its anti-microbial properties. Through their incorporation in composite resins, they are used in restorations, adhesives to enhance the mechanical properties and prevent accumulation of biofilms (4). AgNPs are used in prosthetic dentistry where they are incorporated into polymers as tissue conditioners to prevent denture stomatitis. AgNPs coated implants inhibits the binding of planktonic bacteria thus inducing infection control and favouring wound healing. In Endodontics, Nanosilver gutta percha improved anti-bacterial efficacy of gutta percha (5) by exerting inhibitory activity against Enterococcus faecalis and Candida albicans. AgNPs as irrigant are effective and possess marked bactericidal activity compared with sodium hypochlorite (6). This review aims to highlight the applications of AgNPs in Conservative dentistry and Endodontics.

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SYNTHESIS OF SILVER NANOPARTICLES:

AgNPs are synthesized through physical, chemical and biological methods. Physical methods include ball milling, thermal evaporation, lithography and vapour phase. In chemical methods it is synthesized through sol-gel processing and solution based synthesis. Biological methods of synthesis include the use of bacteria, fungi and yeast. It is also synthesized from plant extracts in which root extracts of *Salvadora persica* is made to react with silver nitrate for 2 hours in 90°C. Biological methods are considered biocompatible and eco-friendly, hence it is the most frequently used method for synthesis.(1)

MECHANISM OF ANTIMICROBIAL ACTIONS OF SILVER NANOPARTICLES:

Silver ions cause destruction of the peptidoglycan bacterial cell wall and lysis of the cell membrane. They bind to DNA bases and causes condensation of DNA, thereby the bacterial cell loses its ability to replicate preventing bacterial reproduction through binary fission. They also denature ribosomes inhibiting protein synthesis and causes degradation of plasma membrane.(7) AgNP has anti-microbial activity against gram negative bacteria creating pits in the cell wall of bacteria.(8)

SILVER NANOPARTICLES IN CONSERVATIVE DENTISTRY:

Composites:

Dental caries is the most common among various diseases in oral cavity due to acid attack from cariogenic bacteria such as *Streptococcus mutans and Lactobacillus spp*. Nowadays, composite restorations are preferred due to esthetic consideration. But these restorations, do not have a long clinical record in most of the cases in comparison with other restorative materials due to secondary caries,(10) microleakage and imperfect sealing between the restorations and the cavity margins.

Hence, to improve the antimicrobial properties of composites, AgNPs has been incorporated into composite resins and adhesive systems as filler particles. The most common technique is adding a monomer, usually 2-(tert-butylamino) ethyl methacrylate, in order to improve Ag salt solubility in the resin solutions.(11)

Dentin Hypersensitivity:

Pressure transferred hydro-dynamically to the pulp is the main cause of dentinal hypersensitivity. Sensitive tooth have twice the diameter and eight times the surface density of dentinal tubules than those in non-sensitive teeth. These characteristics allow the passage and condensations of AgNPs into the dentinal tubules which offers a rapid and long lasting relief byselectively and precisely sealing the dentinal tubules in minutes.(12)

Biofilm:

A research was done by Cheng et al in 2013 (13) to investigate the mechanical properties and biofilm formation of AgNPs incorporated into composite resin. According to this study there was no alteration in the mechanical properties of composites when the AgNP was added at a concentration of 0.028 and 0.042. But there was a 75% reduction in the colony forming units of *Streptococcus mutans* when the AgNP concentration was 0.042. Thus this study proved that AgNP incorporation to composite resins had better antimicrobial and mechanical properties even at low concentrations.

BondStrength:

Melo et al(14) added 0.1%AgNPs by mass to adhesive systems to evaluate the bond strength of composite resins. This study showed a reduction in the metabolic activity of the biofilm without compromising the bond strength.

Anti-Microbial Effect:

Li-et al in 2015 (15) assessed the bacterial inhibition for short and long distance by incorporating 0.05% of AgNP in mass to the adhesive system. The results showed reduced colony forming units and acid production on biofilm near and away from the adhesive, thus proving long distance antimicrobial potential.

Biocompatibility:

To assess the biocompatibility, 0.05% concentration of AgNPs was added to human gingival fibroblasts to check the viability. This study proved that the cytotoxicity was not changed by the addition of AgNPs, suggesting the clinical application of this material.(16)

GIC:

New NanoAg-GIC developed in 2018 (17) proved to exert its antibacterial effect by diffusion. Oxidative dissolution of silver ions from the cement matrix are efficient in arresting caries and preventing the
development of oral biofilms on their surface. Therefore, AgNPs incorporated into GIC provide the release of a quick boost of silver and fluoride ions to be exchanged with carious dentin, proving to be a suitable material in the management of cavitation in high risk patients.

**Dental Porcelain:**

Methods to toughen porcelain have been initiated due to problems such as fragility, chipping and fracture of dental porcelain. Higher fracture toughness and increased Vickers hardness are seen when AgNPs are incorporated into dental porcelain (18). In dental porcelain AgNP affect the behaviour of sub-critical crack growth. The stress corrosion susceptibility co-efficient was increased with the addition of AgNPs. Studies have investigated that, without producing any colour changes, leucite reinforced glass ceramic has the ability to increase its mechanical properties by staining slurries containing AgNPs (19).

**SILVER NANOPARTICLES IN ENDODONTICS:**

Complete eradication and prevention of bacteria from the root canal system is important for successful endodontic treatment. However, bacteria still persist in the root canal system even after meticulous root canal instrumentation, disinfection and obturation (20). Hence it is essential to develop advanced endodontic disinfectants to eliminate bacteria and prevent persistent infections or reinfections.

*Enterococcus faecalis* is commonly associated with persistent periradicular lesions (21). It possess certain virulence factors such as cytolysin, lytic enzymes, aggregation substance, pheromones, and lipoteichoic acid which makes it most resistant to anti-microbial agents (22).

Since *E. faecalis* invade dentinal tubules and cementum, it resists most of the root canal disinfectants and survives for longer periods inside the dentinal tubules even in nutrient depleted conditions in an obturated canal (23). Various nanoparticles (NPs) have been used in root canal irrigants and in intra-canal medicaments. NPs possess a unique mode of action, exhibit potent antimicrobial activity and provide a long term effective treatment at the site of infection at much smaller doses. Among various NPs - AgNPs are biocompatible and possesses a broad spectrum activity. When compared with 2% CHX, 100 ml and 20 ml of AgNPs has the highest zone of inhibition 19.55 mm and the lowest zone of inhibition 10.32 mm against *E. Faecalis* respectively, indicating it can be used as an alternative antimicrobial agent for endodontic disinfection (24).

**Silver Nanoparticals As Irrigant Against Biofims and infected dentinal tubules:**

When compared with chlorexidine, AgNp solution was significantly less effective (P < 0.05) in biofilms when irrigated for 5 min, but no significant difference was observed at 15 and 30 min. Sodium hypochlorite had significantly greater antimicrobial activity compared with AgNp and chlorhexidine solutions which was associated with a lower number of viable bacteria in all time intervals tested (P < 0.05). Significant difference (P < 0.05) was observed with the use of the AgNP between 5 and 15 min, 15 and 30 min and 5 and 30 min, with a reduced number of viable bacteria at longer time intervals (25).

**Conclusion**

In Conservative Dentistry, AgNPs containing restorative materials have superior anti-microbial properties, reduction of recurrent caries and increase the longevity of the restoration, by decreasing the formation of bacterial biofilms.

In Endodontics, biosynthesized AgNPs emerge as novel antimicrobial agents for endodontic disinfection with effective antibacterial efficacy against most resistant endodontic pathogens. The AgNP solution is a suitable root canal irrigant as it was effective in dissolving *E. faecalis* biofilm and eliminating this microorganism from infected dentinal tubules.

**Conflict of Interest:** Nil

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**References**


Role of Fillers in Composite Resin – A Review

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Abstract

Composite resin is widely used in dental practice because of its esthetics. Dental composites incorporated with fillers has a great effect in practice as it brings about reduced microleakage, polymerisation shrinkage, low opacity for better esthetics and better colour stability. Shape, size and distribution of filler particles play an important role in color stability of composites. Microfilled hybrid composites have better finish and polish. Nanofillers composites have best finish and polish thereby providing very good esthetics and stability.

Keywords: Microfilled hybrid composite, Color stability, Polymerisation shrinkage, ONCOMER

Introduction

Resin composites are used for restorative purposes because of its good esthetic and its ability to bond to enamel and dentin¹. Polymerisation shrinkage has been the greatest problem in dental composites ever since they have been brought into practice. The fillers help play an important role in crack pinning and microcrackinduced toughening². The inorganic and organic resin particles functions to strengthen a composite, decrease the thermal expansion, minimise the polymerisation shrinkage and reduce the amount of swelling caused by water sorption. The materials used in fillers are quartz, amorphous silica, colloidal silica, ceramics, glass fillers with metals organically modified ceramics³. Filler shape is also another important factor that stabilises color of the composite resin and other properties like filler particle size and content also have a significant influence⁴. A filler particle size and distribution is directly correlated to optical properties. It also provides a very low opacity thereby improving aesthetics⁵.

Role of fillers

• Strengthen the composite resin
• Reduction in polymerisation shrinkage
• Increases hardnesst and decreases wear
• Improved workability by increased viscosity
• Reduction of matrix material
• Reduction in water sorption, softening and staining.
• Reduction in thermal expansion and contraction
• Increased radiopacity and diagnostic sensitivity
• Increased fracture resistance
• Increased abrasion resistance
• Increased compressive strength, tensile strength and modulus of elasticity
• Increased translucency
• Increased durability and better handling properties

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Classification of fillers

1. Based on filler particle size and shape
   • Tradition – 1-50micrometre
   • Hybrid
     a) Large
     1–20micrometre glass
     0.04micrometre silica
     b) Midfiller
     0.1-10micrometre glass
     0.04micrometre silica
     c) Minifiller
     0.1-2micrometre glass
     0.04micrometer silica
     • Packable hybrid
     • Flowable hybrid
     • Homogenous microfiller
     • Heterogeneous microfiller

2. According to Skinner (1962)
   • Traditional - 8-12micrometre
   • Small particle filled composites - 1-5micrometre

   • Macrofiller composites – 0.1-100micrometre
   • Microfiller particles – 0.04micrometre
   • Hybrid composites

   • Densified composite Midway filled
   • Ultra fine Midway filled
   • Fine Midway filled
   • Ultra fine cement filled
   • Fine cement filled
   • Homogeneous microfine composite
   • Heterogeneous microfine composite
   • Splintered prepolymerized filler
   • Agglomerated prepolymerized filler
   • Spherical prepolymerized filler

5. According to Bayne and Heyman (1988)
   • Megafill
   • Microfiller
   • Midfill
   • Minifill
   • Microfill
   • Nanofill

Role of filler loading in color stability

Filler particle size, shape and distribution play a major role in color stability of composite resins. The composite fillers were classified into 4 categories based on their morphology. They are prepolymerized, irregular shaped, both prepolymerized and irregular shaped and round particles. Filler loading is mainly influenced by filler morphology. Composites containing prepolymerized filler particles has the lowest filler content thereby decreasing the colour stability whereas spherical particles have maximum filler content providing increased colour stability6.

Role of fillers in finishing and polishing

Finishing and polishing are most important steps in restoring the anatomical and morphological form of teeth in order to achieve better aesthetics7. The average size of filler particles in microfilled composite is 0.04um. When this type of fillers in composite resin was used, the surface roughness of the restoration reduced to a certain extent compared to that of early type of composite resin8. Micro hybrid composites were introduced which had a average size of 0.01um to 2um. Studies have shown that microfilled composites have better polish when compared to micro hybrid composites and physical properties and wear resistance of restoration was found to be better in micro hybrid restorations9. Recently, Nanofilled composites have been introduced which ranges from 5 to 100nm. They have widespread
distribution of filler particles which are smallest of size and thus increases filler load, resistance to wear and fracture, reduced polymerisation shrinkage, better polished surface and translucency of the restoration.

Newer advances

1. Nanofilled composites

Nanofilled composite resin have better polish and gloss retention. It has a refractive index of 1.51 which is similar to that of a tooth. Hence the color stability is increased. Nanofilled composite resin exhibits higher wear resistance than that of hybrid composite resin materials.

Nanomers

- Primary zirconia and silica nano particles 5-20nm
- Nano hybrid composites
- Nanodiamond filler

2. Flake shaped glass filler

These are thin flat platelets which improves color stability by increasing transparency. They have high flowability and smooth surface.

3. Polymethacrylate filler particle

4. Leucite containing ceramic fillers

Addition of 3% Nano ZnO to clearfill resin composite decreases the shear bond strength whereas in Z-350 group had increased shear bond strength. At the same time NZnO particles lowered the microleakage in composite resin. Adding polymeric nanofillers, metallic nanofibers and inorganic nanofillers produces the formation of interface interaction and poststretching nanofibers results in reinforced effect in dental composites. A study showed that Dental composites filled with thiourethane-silanized inorganic fillers showed 35% lower stress while doubling mechanical properties values.

5. ORMOCER

Ormocer being a complex organic matrix contains 3-dimensionally linked inorganic-organic copolymers (ormocers). The additive aliphatic and aromatic dimethacrylates present in Ormocer has high wear resistance as compared to microfilled or microhybrid composite thereby resisting discoloration. Excessive water sorption causes decrease in life of a composite resin by expanding and plasticizing the resin component, hydrolyzing the silane, and thereby resulting in micro crack formation. Therefore the micro cracks or interfacial gaps present at the interface between the filler and matrix allow stain penetration and discoloration.

Conclusion

We conclude that, nanofilled composites retain polish and translucency and produce a smooth glossy surface better than microfilled composites and have equivalent physical properties and wear resistance to that of micro hybrid composites thereby providing better esthetics.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Not required for review manuscript.

References


Nonsurgical Management of Periapical Lesion with External Root Resorption Followed by Orthodontic Treatment in Maxillary Lateral Incisor

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Abstract

The aim of this case report is to discuss the radiological outcome of a nonsurgical management of periapical lesion with external resorption followed by orthodontic treatment of the maxillary lateral incisor. A 33-year-old female reported with missing tooth in the maxillary anterior region as a result of surgical extraction of maxillary left canine tooth. Patient was referred for intentional root canal treatment in 22 followed by fixed prosthesis. The radiograph revealed external resorption in 21 and 22. After preparation of the access cavity, the necrotic pulp was removed and the canal irrigated using 5.25% sodium hypochlorite solution. The canal was then dried and packed with calcium hydroxide for 6 weeks. After removal of calcium hydroxide, canal was disinfected, dried and four millimetres of MTA orthograde filling was carried out. After 24 hrs, root canal was obturated with back fill using system B. At 1-3-6, month recall, the tooth was asymptomatic with no pain on percussion or palpation. Radiographic examination demonstrated continued thickening of root canal walls, root lengthening and apical closure.

Key words: External root resorption, Calcium hydroxide, Orthograde filling.

Introduction

Root Resorption is defined as mechanical & chemical injury to the protective tissue and stimulated by infection (or) pressure. It is a dental complication that can lead to loss of tooth. Fuss et al (1) classified root resorption as, 1. Apical root resorption (orthodontic movement), 2. Inflammatory root resorption (impacted tooth or tumour), 3. Internal root resorption (pulpal infection), 4. External resorption & cervical resorption (periodontal infection).


Bacteria in the pulp space and dentinal tubules triggers the osteoclastic activity on the root surface resulting in periapical lesion.

Case Report

A 33 yr female came to the dental office with the chief complaint of missing maxillary left canine tooth and gives history of impacted canine that was removed surgically 3 months from the day of visit. Patient was referred to our department for intentional root canal treatment in 22 followed by fixed prosthesis.

On clinical examination, mesially tilted left maxillary lateral incisor with no evidence of dental caries, non tender on percussion, without any sinus opening, soft tissues are apparently normal, vital status of the tooth 22 is nonvital. On radiographic examination presence of radiolucent area of around 1x1.5 cm in size that surrounds the lateral surface of 21 and encloses the root apex of 22 with disturbed apical constriction in relation to 22 (Figure-1).
On clinical examination and radiographic findings the tooth # 22 was diagnosed to be necrosed with external inflammatory resorption. Hence, root canal treatment was advised in 21 and 22 to prevent further resorption.

Local anaesthesia was administered using 2% lidocaine with 1 : 100 000 epinephrine. The tooth was isolated using a rubber dam (Hygenic Dental Dam, Coltene Whaledent, Langenau, Germany). An access cavity was prepared using an Endo Access bur (Dentsply Maillefer, Ballaigues, Switzerland) in a high-speed air turbine handpiece (NSK PANAR AIR, Nakanishi Inc., Tochigi-ken, Japan) with copious irrigation. Upon accessing the pulp chamber, no haemorrhage was noted from the root canal, necrotic pulp was removed from the canal. The working length was determined by placing a size #25 K file (Dentsply Maillefer) in the canal and taking a periapical radiograph (Figure-2). Cleaning and shaping was performed with step back technique MAF #55 k-file in 22, #60 k-file in 21 irrigation of the canal was performed using 10 mL of 5.25% sodium hypochlorite solution (Dentpro, Chandigarh, India) to further disinfect the canal. The canal was then dried with sterile absorbent paper points (Dentsply Maillefer).

Calcium hydroxide was introduced in the canal with a lentulo spiral (Dentsply Maillefer) and packed with the blunt end of sterile paper points. The access cavity was then sealed with 4 mm of Cavit (ESPE, Seefeld, Germany)Figure-3

The patient recalled after 6 weeks for the review, tooth was asymptomatic to percussion and palpation tests. Confirmatory radiograph was taken, that shows evidence of bony trabeculae formation and reduction in the size of periapical lesion (0.5cm) in 22(Figure-4), followed by rubber dam isolation, access cavity was reopened and the medicament was flushed out of the canals using sterile saline solution (Nirma healthcare Ltd, Gujarat, India). The canal was then dried with paper points. 4mm of orthograde filling was carried out with white MTA and temporarization done with wet cotton and Cavit (ESPE) in 22.(Figure-5). After 24 hrs root canal was obturated by backfill using system B in 22 and cold lateral compation was carried out in 22 using MTA filapex sealer (Figure-5). With the concern from orthodontic department, minor tipping of 22 was carried out with orthodontic appliances.After a month there was no history of pain or discomfort. The clinical examination revealed that no sensitivity or pain was present to percussion and palpation tests.

At 3rd month recall the patient continued to be asymptomatic. The radiographs showed continued root repair and reduction in the severity of lesion and no progression of resorption due to orthodontic treatment (Figure-6).At 6th month recall The radiographs showed continued root repair and satisfactory healing of resorative sites (Figure-7).
Tronstad et al (4) described the pathogenesis of external root resorption which is initiated on mineralized or denuded area of root surface that is prolonged by mechanical irritation along with stimulation of resorbing cells, in turn increases the acidic phosphatase level and also increases the osteoclastic activity (stimulated macrophage progenitor cells) – RANK-RANKL-OPG system, down regulation of osteoprotegerin & upregulation of receptor activator of nuclear ligand, followed by infectious inflammation by release of macrophage chemotactic factor, osteoclast activating factor, prostaglandins, bacterial endotoxins.

External Root resorption mostly requires surgical approach by elevating the flap followed by root end preparation and retrograde filling.

This case report presents the non-surgical approach in treating large periapical lesion with external root resorption using calcium hydroxide as intra canal medicament and orthograde filling for the root end repair, and the nature of the orthodontic movement of endodontically treated tooth with external resorption.

Calcium hydroxide eliminates the bacteria when used as an intracanal medicament (5) and arrests the inflammatory root resorption as well as promotes the stimulation of healing in treating resorption. Tronstad (4) described the action of calcium hydroxide in resorption.
case as follows,

Ca(OH)₄ diffuse from the dentin

Changes acidic environment to alkaline

Activation of alkaline phosphatase

Initiate osteoblastic activity

Deposition of cementum osteo dentin

Hammarstron et al (6) stated that high Ph calcium hydroxide is the reason for the bactericidal effect and causes irritation to the surrounding tissues that had stimulated pulpal defense and repair (7). The long term calcium hydroxide is more effective than short term in resorption (8). Intra canal medicament with calcium hydroxide can arrest resorption and initiate healing if resorption located apically rather cervically. On follow-up visit after 3 month of calcium hydroxide, periapical radiograph revealed arrested root resorption process and decrease in size of periapical radiolucency. Rosenberg and Murray et al (9) described the microtensile fracture strength of dentin is reduced by 23-43.9% following root canal filling by calcium hydroxide. Ca(OH)₄ in canal followed by MTA shows no significant decrease in the strength of dentin in pulpal necrosis & immature root formation (10).

MTA as orthograde filling showed 66% of cementum formation and the layer formed are consistent in contour and uniform thickness (11). MTA is a cemento conductive material and permits cementoblast attachment & growth and production of mineralized matrix gene & protein expression. The diffusion of Ca⁺ through the defect in dentin in MTA filled root shows a significant increase in concentration with increase in time. MTA Fillapex was used as it was proven that the presence of MTA in sealer did not improve the bone tissue repair, rather it provided, re-establishment of original bone tissue structure and inflammatory response decrease over time (12).

Conclusion

Despite the serious damage to the root by external root resorption, nonsurgical root canal therapy arrested the root resorption and regenerated the periapical tissue. Though the outcome cannot be predicted, it is worth an effort to try to slow down the resorption process and maintain the tooth as long as possible in the arch for esthetics, mastication.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Not required for case report.

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Regenerative Endodontics-Clinical Procedure and Tooth Discolouration: A Review

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Abstract

Regenerative endodontics in discoloured tooth involves introduction of stem cells into the disinfected canal space followed by medications and sealing of the dentinal tubules. Discolouration is more an important factor for many people to achieve an aesthetic smile than restoring the normal alignment within the arch. Tooth discoloration induced by endodontic material is one major concern in dentistry. The three main factors that affect discoloration are intracanal medicament, coronal barrier and dentin bonding agent. Recent studies show that sealing dentinal walls of access cavity with dentin bonding agent helps to avoid discoloration of tooth.

Keywords: Tissue regeneration, Scaffolding matrix, Coronal barrier, Dentin bonding agent, Biomineralization

Introduction

In the regenerative endodontics, damaged structures and cells in the pulp–dentin complex are replaced with live viable tissue, which restore normal physiologic functions. Regeneration rather than replacement of tissues with an artificial substitute is an emerging and exciting field of medicine [1]. Tooth discoloration creates a wide range of aesthetic problem, and considerable amounts of time and money are invested in the attempts to improve the appearance of discolored teeth. Change in tooth structure changes the appearance of the tooth due to transmitting and reflecting property [2]. Some discolorations are located on the outer surface of the tooth structure, others are caused by stain taken up by the enamel or dentin, and some occur during tooth development and result in an alteration of the light transmitting properties of tooth structures [3]. Tooth discoloration induced by endodontic materials is usual concern for treatment quality. Transmission of material discoloration by hard tissue causes tooth discoloration hence Selection of material is crucial to use in esthetic zone [4]. Many studies have shown that discoloration is a significant negative outcome following regenerative endodontic procedures. A combination of ciprofloxacin, metronidazole and minocycline is suggested for bacterial disinfection. Lenherret al [5] reported that the calcium hydroxide dressings did not show any discoloration or differ from the negative controls at any time point. The purpose of this literature review was to investigate findings and reports on the crown discoloration following regenerative endodontic treatment.

Regenerative endodontic procedures (REP)

REP has paradigm shift in management of immature
teeth resulting in root lengthening, wall thickening and apical closure\(^6\). Regenerative endodontics is defined as the “biological procedure to replace affected tooth structures, such as dentin, cells of pulp dentin complex and root structures”\(^7\). The biological concept of regenerative endodontics involves the triad of stem cells, scaffold platforms and signaling molecules\(^8\). The clinical considerations for regenerative endodontic protocols are disinfection of the root canal system; provision of a scaffold in the form of a blood clot that forms after laceration of the periapical tissue to induce bleeding and introduce mesenchymal stem cells within the root canal; and an adequate coronal seal to prevent reinfection\(^9\). The current recommended clinical protocol for REPs is described by the American Association of Endodontists\(^10\).

**Intracanal medicaments**

The success of revascularization/revitalization therapy depends on efficient disinfection of the root canal system. The traditional triple antibiotic paste (TAP) consisting of ciprofloxacin, metronidazole, and minocycline has good antimicrobial properties in infected root canals\(^11\). Despite these positive features, numerous case reports have shown that minocycline causes visible crown discoloration\(^12\). A practical way to prevent discoloration is replacing minocycline with an antibiotic that does not stain teeth. It is reported a successful regenerative endodontic treatment of a maxillary central incisor by using cefaclor instead of minocycline. Study of a successful Single visit regenerative endodontics used irrigation of NaOCl and chlorhexidine gluconate and MTA placement without bleeding\(^13\). Earlier reports describes the use of calcium hydroxide as the vast majority of published cases seem to have employed a combination of antibiotics as the preferred intracanal medicament \(^7\). However, these antibiotic pastes have been shown to be cytotoxic to the survival of SCAP in concentrations equal to or higher than 1 mg/mL in in vitro studies. In contrast, the disinfection of root canal space with calcium hydroxide promoted the proliferation of SCAP\(^14\). Calcium hydroxide increased the liberation of growth factors from dentin, whereas antibiotic paste negatively influenced growth factor release after the use of EDTA\(^15\). The AAE clinical considerations in regenerative endodontic advocate the use of either a combination of antibiotic paste or calcium hydroxide paste\(^10\). A retrospective radiographic study employing a quantitative analysis of teeth treated with REPs showed that teeth medicated with calcium hydroxide had a significantly greater increase in root length than the teeth medicated with the combination of antibiotic paste. Importantly, teeth treated with the combination of antibiotic paste had significantly greater increases in root canal wall thickness. The placement of calcium hydroxide within the canal appeared to favourably affect the outcome of the treatment. When calcium hydroxide was restricted to the coronal half of the root canal, as demonstrated radiographically, the median increase in the dentinal wall thickness was 53.8%. This contrasted with just a 3.3% increase when calcium hydroxide was present in the apical half of the root canal. The percentage of change in root length was not affected in either of these different clinical protocols\(^16\). The results of a cohort study of 12 teeth medicated with a triple antibiotic paste showed apical closure in 66.7% of cases, increased root wall thickness in 41.7%, and increased root length in 41.7% of cases. In comparison 11 teeth medicated with calcium hydroxide showed apical closure in 54.5% of cases, increased root canal thickness in 45.4%, and increased root length in just 27.3% of cases. These findings were considered comparable outcomes, and hence, the application of either medicament is supported for use in the regenerative endodontic procedures \(^16\). Histologic evidence of successful treatment in this study demonstrated that the introduced method of root canal disinfection is a promising protocol for immature necrotic teeth, and the use of triple antibiotic paste may not be necessary. Studies introduced novel methods to shorten the treatment period and also prevent tooth discoloration by omitting the intracanal medication process.

**Coronal barriers**

**Mineral trioxide aggregate**

Mineral trioxide aggregate (MTA) is a biomaterial that is being investigated for endodontic applications since the early1990s \(^17\). In 1993 MTA was first described in the dental scientific literature and In1998 it was approved for endodontic use by the U.S. Food and Drug Administration \(^18\). The MTA materials are a mixture of a refined Portland cement and bismuth oxide, and are reported to contain trace amounts of SiO2, CaO, MgO, K2SO4, and Na2SO4\(^19\). The major component, Portland cement it is a mixture of dicalcium silicate, tricalcium silicate, tricalcium aluminate, gypsum, and tetra calcium alumino ferrite\(^20\). MTA solidify like...
other mineral cements, in which the anhydrous material dissolves, followed by the crystallization of hydrates in an interlocking mass \(^{[21]}\). The basic framework of the hydrated mass is formed by the interlocking of cubic and needle-like crystals in which the needle-like crystals form in sharply delineated thick bundles that occupy the inter-grain space between the cubic crystals \(^{[22]}\). The effect of mixing MTA powder with different liquids and additives has shown that the choice of preparation liquid can have an effect on setting time and compressive strength\(^{[23]}\). In 2002, white MTA, was introduced as ProRoot MTA (Dentsply Endodontics, Tulsa, OK, USA) to address esthetic concerns. After that time, two forms of MTA materials were categorized: the traditional gray MTA and WMTA. Scanning electron microscopy (SEM) and electron probe microanalysis characterized the differences between GMTA and white MTA and found that the major difference between gray MTA and white MTA is in the concentrations of Al\(_2\)O\(_3\), MgO and FeO\(^{[24]}\). The mechanisms how white MTA influences on coronal tooth discoloration and those by which blood exacerbates this discoloration are not fully elicited. The possible mechanism is the oxidation and incorporation of the remaining iron content within the white MTA powder into the calcium alumino ferrite phase of the set white MTA cement. Even though white MTA has 9% of the iron oxide of gray MTA, this quantity may be adequate for causing discoloration. White MTA also interacts with erythrocytes. Discoloration of traumatized teeth results from the hemolysis of erythrocytes and the accumulation of hemoglobin and hematin molecules within dentin tubules. The slow hydrating process of white MTA may permit the absorption and subsequent hemolysis of erythrocytes from the adjacent pulpal tissue, thus resulting in both material and subsequent tooth discoloration\(^{[25]}\). The descriptions of various bioactive molecules including growth factors lead to exciting alternative treatments of dentin-pulp complex. The usage of growth factors alone in regenerative treatment approaches tried to be developed imitating the physiological events of the body has been questioned\(^{[26]}\). Newly formed tissues in the canals could extend to the surface of MTA or occupy half of the canal space after 3 months. The growth of the tissue into the canal seemed not limited by the blood supply with an apical opening of 0.8 mm in diameter. When tissues engineered in the laboratory are implanted into the human body, only cells within 100–200 mm from the nearest capillary can attain sufficient diffusion of nutrients to survive. Thus, a voluminous tissue be pre-vascularized for achieving immediate and sufficient blood supply after implantation. MTA is a good material for pulp capping and apexification, which can induce dental pulp cell differentiation and the secretion of mineralized tissue. 0 Cells in new vital tissues in the apical pulp were more immature with larger and deeply stained nuclei. These cells pertain more potential for multilineage differentiation. Cementum-like tissue was along the internal root canal walls. In some cases, cementum-like tissue inside the root canal was connected with root surface cementum. The source of stem cells responsible for bone-like and cementum-like tissues is not clear, possibly from the periapical tissues\(^{[27]}\). Discoloration after treatment of teeth that were treated with calcium hydroxide might be related to presence of MTA in cervical portion of the root canal space. A recent report on pulp capping in anterior teeth revealed that presence of white MTA in the crown can cause considerable discoloration. In clinical and radiographic follow-ups, both teeth was functional, the apices formed and periapical lesions were healed. However, the roots were not developed. After 6 years, because of moderate discoloration and caries, teeth received root canal therapy and were permanently restored with casting dowel core and full crown restorations \(^{[28]}\). A disadvantage of the MTA is discoloration of the coronal dentin when placed in the canal. McTigue et al \(^{[29]}\) reported that 14 teeth discolored. The first 10 cases were treated with TAP including minocycline, which was then discontinued and substituted with clindamycin because of concerns with discoloration. Gray MTA, which has been linked with tooth discoloration was used in the first 12 cases, and this was then substituted with white MTA because of concerns with discoloration. Although 7 of the discolored teeth occurred when minocycline and gray MTA were used, 7 teeth also discolored when neither minocycline nor gray MTA was used \(^{[12]}\). These authors noted that white MTA has been implicated in tooth discoloration. Spectrophotometric analysis of coronal discoloration induced by gray and white MTA, found that both materials discolored teeth. However, the effect was more marked with gray MTA.

**Calcium silicate-based materials**

The bio-mineralisation ability of Biodentine initiates calcium and silicate uptake by the dentin, which in turn would cause chemical and structural modification of dentin that may result in higher acid resistance and
physical strength. Calcium silicate-based cements adhere to root dentin to form a crystalline bond in a biochemical process termed bio-mineralisation\cite{30}. Hence, the use of Biodentine as an obturation material may eventually improve the resistance of the endodontically treated immature teeth against fracture. Compared to other tricalcium silicate cements biodentin has greater compressive strength, which is attributed to the low water/cement ratio made possible by the water soluble polymer in the liquid. Discoloration is either a result of materials ingressing into dentinal tubules or by material remnants in the pulp chamber, which get darker over time and is transmitted through the hard tissues. The consistent with the literature as Biodentine exhibited color stability independent of oxygen and light irradiation. Biodentine TM, as a suitable material, has been suggested for the purpose of dentin-pulp complex regeneration in the clinical setting. The author stated that biodentin TM helps in revascularisation and maintenance of pulp vitality and root maturation\cite{7}. In a study on evaluation and comparison of occurrence of tooth discoloration after the application of various calcium silicate-based cements revealed that there was no significant difference between discolouration of tooth using Biodentine (Saint Maur des Fosses, Septodont, France), OrthoMTA (BioMTA, Seoul, Korea), and EndoSequence Root Repair Material (ERRM; Brasseler, Savannah, GA) in the presence of blood. Absence of blood, ERRM and Biodentin exhibited less tooth discoloration than OrthoMTA.

Dentin bonding agents

One of the methods to decrease discoloration is using dentin bonding agents. Kim et al\cite{7} examined the performance of this prevention technique for tooth discoloration. In this study teeth treated with dentin bonding were evaluated with naked eye and then with colorimeter. In the eye assessment teeth did not have any change in color, but in the colorimeter assessment they had. They concluded that using dentin bonding agents before placement of the triple antibiotic paste might not completely prevent tooth discoloration. The dentin bonding agent can only decrease the intensity of the discoloration \cite{7}. One possible way to minimize discoloration is to seal the dentinal walls of the access cavity with dentin bonding agent\cite{12}. Sealing the dentinal tubules of the chamber prevents the coronal discoloration produced through tri-antibiotic medication while maintaining the pulp revascularization\cite{6}. The administration of the dentin bonding agent before filling the pulp cavity with MTA prevented the MTA component from penetrating into the dentinal tubules which decreased discoloration. Applying a dentin bonding agent before MTA placement can minimize tooth discoloration. Keskin et al\cite{4} reported that discoloration induced by calcium silicate-based materials diminished by the administration of a double layer of dentin bonding agent in the access cavity or via treating with internal bleaching. The application of dentin bonding agent, to seal dentinal tubules before placement of the white and grey MTA, prohibited dental discoloration.

Scaffolding Matrix

3D scaffolds are the essential parts of the tissue engineering triad. An ideal scaffold can be significantly facilitate attachment, migration and proliferation of stem cells, and 3- D spatial organization of stem cells and infiltration of host cells. While the current REP protocol assumes an endogenous scaffold from fibrin of clotted blood, other autologous sources such as PRP and platelet-rich fibrin (PRF) have also demonstrated comparable outcomes in animal as well as human clinical reports. In addition to providing a structural matrix for stem cells, functional modifications to scaffolds can uniquely add to their utility in a REP. In cases where adequate bleeding to the CEJ cannot be evoked scaffolding material can be supplemented with chemoattractants that can facilitate stem cell migration. To this end, a recent in vitro study evaluated several chemoattractants and found Granulocyte-Colony Stimulating Factor (G-CSF) and Fibroblast-Growth Factor-2 (FGF-2) to have considerable chemoattractive properties for SCAP \cite{17}. The PRF clot forms a strong natural fibrin matrix, which concentrates almost all the platelets and growth factors of the blood harvest \cite{4} and shows a healing matrix, including mechanical properties no other platelet concentrate offers. The PRF can be considered as a natural fibrin-based biomaterial favourable to the development of a micro vascularization and able to guide cell migration into wound area. For higher success rate, more demand exists to develop new biocompatible material that reduce pulp inflammation and promote the formation of dentin pulp tissues \cite{7}. However, it was shown that the newly grown tissues into the root canal space have little similarity to normal pulp tissue but with more resemblance to cementum, periodontal ligament, or bone. The cause of this outcome is possibly related to the lack of stem cells derived from remaining vital
pulp and apical papilla, which are destroyed by severe endodontic infection. Stem cells responsible for newly regenerated tissues might be derived from several other sources, including systemic blood or local tissue such as bone [12]. Furthermore, whether these newly formed tissues can function like normal pulp and stabilize the tooth without giving rise to further infection or canal obliteration still remains unknown.

**Conclusion**

In conclusion 3 factors affect discoloration including intracanal medication, coronal barrier and using dentin bonding agent. It has been suggested that one possible way to avoid discoloration is to seal the dentinal walls of the access cavity with a dentin bonding agent. The recent review in dental traumatology does seem timely because there does appear to be a lack of evidence and conflicting results as well as a paucity of prospective studies.

**Conflict of Interest:** Nil

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**References**


Type of article – Case Report

A Stitch in Time Saves Nine – A Simple IOPA in Time Saves Tooth

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Abstract

Foreign bodies / objects are substances that are non-native to the area of interest. They may frequently cause irritation or allergic reactions. An unnoticed foreign body may lead to deteriorating sequelae. Self introduced foreign body into the root canal of mandibular incisors is a rare occurrence. This Case discusses about a 13 year old boy who self introduced a metallic foreign object into the root canal of 32. A simple IOPA on time helped in appropriate management of the tooth and prevented deteriorating sequelae.

Key Words: Self introduced foreign body, mandibular incisor.

Introduction

Foreign bodies are objects that are not native to the body and have been introduced accidently or by design. Foreign body ingestion is quite common among children; likewise forceful impaction of foreign objects into the tooth has also been reported in literature[¹, ²]. Staple pin, straight pin, paper clip[³], nail, sewing needle, incense stick, beads are the various foreign objects that have been forced into the tooth[⁴, ⁵]. Exposed pulp chambers due to trauma or caries provide an opportunity for such foreign body impaction. Patients tend to introduce such objects either to relieve pain or clear food debris plugged into the canal[⁶]. This acts as a focus of infection. If unnoticed the foreign body may lead to abscess formation or even deteriorate to osteomyelitis with sinus tract formation[⁷].

Foreign objects inside the root canal system create hindrance to proper BMP and obturation.

Such foreign objects when deeply impacted within the canal can be challenging to manage[⁸]. Several retrieval methods are employed to remove disengaged endodontic instruments within the canal. Depending on the location and position of the foreign body within the root canal similar methods can be used to retrieve them however no standard technique has been recommended[⁹, ¹⁰]. This article discusses a case of a 13 year old boy who forcefully introduced a metallic foreign object inside the root canal of mandibular lateral incisor and its diagnosis and management.

Clinical Case:

A 13 year old boy reported to Oral Medicine and Radiology department, Sree Balaji Dental College and Hospital, Chennai with a chief complaint of pain and discharge from the oral cavity in relation to the lower front teeth region for the past two weeks. (Figure 1) History revealed that the boy had pain that was continuous, sharp and lancinating in nature. Pain did not subside upon medications. Patient did not give any history of previous endodontic management of the tooth. Patient had no medical history or systemic illness.

On examination, a fracture exposing the pulp chamber was evident along with pus discharge in 32. (Figure 2) An IOPA was taken in relation to 31,32,33 region. Radiograph revealed a radiopaque foreign object in the apical third of root and extending well into the periapical region of 32. (Figure 3)
Root Canal Treatment was planned to retrieve the object and save the tooth. Patient was referred to the Department of Endodontics for further management. After the Clinical and Radiographic examination of the tooth access opening was performed and redefined to ease the access of the fractured fragment under microscope. Attempt was made to retrieve the foreign object using H-file. (Figure 4) The file was inserted into the canal and used to engage the foreign object. (Figure 5) The H-file dislodged the foreign object into the pulp chamber and it was retrieved. (Figure 6) The object was 16 mm in length. (Figure 7) An IOPA was taken to confirm the complete retrieval of foreign object. (Figure 8) An open dressing was given in the first appointment. Patient was recalled after three days and clinically evaluated. The tooth was asymptomatic. The canals were wet which was evaluated by paper points and an open dressing was given for the patient. After five days the patient was recalled for the next visit and upon clinical evaluation the patient was asymptomatic. The canals were found dry following which DentoCal was placed and access temporized with Zinc oxide Eugenol (Anabond Stedman Pharma research Pvt Ltd).

Patient reported after two days with pain. Calcium hydroxide medicament was removed and open dressing was given. Patient was recalled after three days for calcium hydroxide medicament placement and access temporized with Zinc oxide Eugenol (Anabond Stedman Pharma research Pvt Ltd).

Following two weeks recall visit the patient was recalled for BMP and obturation. The tooth 32 was found to be asymptomatic; subsequently the tooth was obturated by lateral compaction (FIGURE 9).

On a one month follow-up patient was asymptomatic and showed no sensitivity to percussion or palpation. The soft tissues were healthy.
Discussion

Self introduction of foreign objects into the pulp chamber and root canals is a rare occurrence in adults. Staple pins and needles are frequently forced into the root canals. In this case the patient did not give any previous history of dental treatment for 32. Following trauma the tooth was fractured exposing the pulp chamber which lead to food lodgment and discomfort to the patient. The patient gave a history of inserting sharp pin into the pulp chamber to relieve pain and discomfort. However patient did not recall any history of broken pin inside the tooth. In this case exposure of the pulp chamber provided an opportunity for the child to self introduce a metallic foreign object into the canal.

Patient had not reported for treatment of the fractured tooth earlier. After the forceful impaction of metallic pin, pain and pus discharge was elicited from the tooth which directed the patient to report for dental management. Upon careful clinical examination a provisional diagnosis of Ellis class III fracture in 32 was made. IOPA taken for the tooth of interest revealed a radiopaque foreign object in the apical third which extended into the periapical region. The presence and location of the foreign body explains the elicitation of pain and pus discharge.

In this case a 20 size H-file was used to engage and retrieve the foreign body. BMP and obturation was performed in the following visits. After treatment tooth was asymptomatic. Precise diagnosis and selection of correct retrieval method dictate the success of the treatment. Extraction was not necessary for the tooth and a simple, cost effective IOPA has saved the tooth.

Conclusion

Immediate attempt to retrieve such foreign bodies when detected in root canal system must be made. Simple IOPA and non surgical procedures can save tooth from extraction and help to restore normal function and esthetics. Non compliance to non surgical methods may demand surgical management of tooth with impacted foreign body.

Ethical Clearance – Not needed as it is a case report

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References


Plasma Cell Gingivitis- A Case Report

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Abstract

Plasma cell gingivitis (PCG) is a rare condition of the gingiva, characterized by infiltration of plasma cells. Being a rare benign condition of the gingiva, PCG is characterized with erythematous and edematous gingivitis. The biologic phenomenon of the hypersensitive reaction appears to be chief etiology behind this occasionally presenting clinical entity. Plasma cell gingivitis has a close resemblance to discoid lupus, lichen planus, cicatricial pemphigoid or leukemia, and HIV gingivitis. It is known to present as a hypersensitive response to allergen, but sometimes it could present as a clinical entity with unknown etiology.

This paper reports a 60 year old female patient with the complaint of bleeding and swelling of gingiva since 2 months. On detailed history, patient was first diagnosed as drug induced gingival enlargement and based on histopathological findings, a diagnosis of plasma cell gingivitis was made.

Keywords: Gingival enlargement, hypersensitivity, plasma cell gingival enlargement, plasma cell gingivitis.

Introduction

Gingival overgrowth or gingival enlargement is a common trait of gingival diseases featured either isolated or generalised with varied appearances. Numerous types of gingival enlargement are classified on the basis of etiology, systemic factors and pathological findings and its diagnosis may require extensive investigations due to varied clinical and histopathological features. One of the causes of conditioned gingival overgrowth is plasma cell gingivitis (PCG). It is an uncommon condition characterised by diffuse infiltration of non-neoplastic plasma cells in the sub-epithelial tissue. The etiology is difficult to elicit; however specific known allergens have been found to be responsible, e.g., toothpaste, khat, food, chewing gum, and also of unknown origin. Clinically, it manifests as bright red oedematous gingival swelling usually localized and sharply demarcated from the mucogingival junction. PCG such as atypical gingivitis, plasma cell gingivostomatitis, plasmacytosis of the gingiva and allergic gingivitis.

Case Report

A 60 year old female patient reported with a chief complaint of unesthetic swelling of gums in upper and lower region of teeth since 2 months with burning sensation of the mouth on taking hot food. Over the period of time, gingival enlargement occurred in the entire quadrants with progressive increase in size with mild mobility of teeth which restricted patient’s dietary habits. The medical history revealed that patient was under history of amilodipine since 10 years. Oral examination revealed generalized severe gingival inflammation and enlargement covering up to the middle half of the clinical crown [Figure 1]. Erythema was pronounced in relation to the maxillary and mandibular anterior region and also associated with mild gingival enlargements in posterior region. There was no generalized loss of attachment. Generalized pseudo pockets ranged from 4mm to 6mm. Bleeding on slight manipulation. Macroscopically the gingiva appeared oedematous with loss of stippling. There is no history of change of oral hygiene products like toothpaste or consumption of chewing gums. There was no history of loss of appetite, fever or lack of sleep. The clinical examinations of drug induced gingival...
enlargement and plasma cell gingivitis was considered.

Orthopantomographic examination revealed a generalized moderate horizontal bone loss. Routine hemogram and biochemical tests were within normal limits and microscopic examination of the representative gingival tissue showed focal ulceration, prominent inflammation with fairly large number of plasma cells. There is also abundant fibroepithelial hyperplasia [Figure 2]. The histopathological final diagnosis of the above case is plasma cell gingivitis.

Prior to local management, the patient was thoroughly assessed by a physician and a suitable premedication therapy was instituted. Under local anaesthesia, the enlargement was resected segment wise by a modified flap surgical procedure. There were no postoperative complications and the healing was uneventful. [Figure 3] The patient was followed up for a period of 2 months regularly.

Figure 1: Severe Gingival Inflammation and Enlargement

Figure 2: Inflammatory Cells – Predominantly Plasma Cells Are Seen

Figure 3: Post Operative Image Showing Healing And No Evidence Of Inflammation

**Discussion**

Plasma cell gingivitis is a rare condition, characterized by diffuse and massive infiltration of the plasma cells into the connective tissue. The first case was reported by Kerr *et al.* in 1981, when they observed gingival enlargement in gum chewers, which disappeared the discontinuation of the chewing habit. Plasma cell gingivitis has been classified into three types by Garguilo, Timms *et al.*, as an immunological reaction to allergens, neoplasia or of unknown origin. In our case, the etiology was unknown (and hence, can be classified as the third variant of PCG).

Clinically, PCG presents as a diffuse reddening, together with edematous swelling of the gingiva, with a sharp demarcation along the mucogingival border. In our case, the patient presented with a fiery red gingival enlargement, localized to the anterior segment of the jaws, refractory to oral prophylaxis. These findings are consistent with earlier reports. Although the co-existence of PCG with aggressive periodontitis and psoriasis has been reported, no such association has been reported earlier with muscular dystrophy.

On the other hand, gingival swelling in PCG may result in the accumulation of plaque and calculus providing conducive environment for bacterial proliferation, and breaching the epithelial barrier in established gingivitis. This may result in activated immune response by secretion of various cytokines such as interleukin (IL)-12, IL-18 by dendritic cells, tumor necrosis factor (TNF)-α, IL-6, IL-8, macrophage inflammatory protein (MIP)-1 alpha by gingival fibroblasts and matrix metalloproteinase (MMP), laminins by periodontal fibroblasts. These cells contribute to bone resorption via cytokine production and receptor activator of nuclear factor-kB ligand (RANKL). Further bacterial antigenic challenge activates adaptive
immunity with T cells and B cells playing the central role in progression of the lesion\(^9,10\). Adding to this, the proliferative plasma cell infiltrate in PCG can further aggravate the condition. The activated antigen specific B cells in PCG differentiate into plasma cells which secrete antibodies against the foreign antigen. It has been observed that activated B cells can induce bone resorption in RANKL dependent manner by production and release of different cytokines\(^11\).

Therefore, the antigenic challenge in PCG can aggravate periodontal tissue breakdown in two ways. Firstly, the individual’s innate susceptibility along with inability to maintain proper oral hygiene in area of gingival swelling (PCG) and secondly due to the release of inflammatory mediators, cytokines and proteases, activating bone resorption pathways. Whether PCG appeared first or GAP can only be known with patient’s awareness of the disease process since its initial presentation, as this will help in depicting the exact history, signs and symptoms. To conclude, this case underscores the importance of comprehensive history taking and diagnostic investigations for varying clinical presentation of gingival conditions. PCG is the oedematous swelling of the gingiva generally due to an allergic reaction. The presentation of PCG may be localised or generalised depending on the genetic and immune susceptibility of the individual in association with environmental factors. Further, assessment is needed to underpin the mechanism explaining concurrence of PCG with aggressive periodontitis.\(^1\)

Histopathological examination of PCG reveals plasma cell infiltration in a dense collagenous stroma. Histologically, this condition must be differentiated from other aggressive conditions, such as, leukemia, plasmacytoma, multiple myeloma, and Waldenstrom’s macroglobulinemia, to facilitate early treatment for a better prognosis.\(^12,13\)

Several medical and surgical therapies have been tried for the management of plasma cell gingivitis, with variable success. The medical treatments tried include, topical/ systemic antihistaminics, corticosteroids, antimicrobials, and surgical modalities, including, excision by laser, electrocoagulation, and so on.\(^14\) Our patient responded to periodontal flap surgery accompanied with an antibiotic prophylaxis and analgesics for a week.

**Conclusion**

The importance of detailed history-taking, examination, and conduction of appropriate diagnostic tests, to arrive at a definitive diagnosis, is emphasized. An early diagnosis would direct the clinician toward an appropriate treatment plan, especially for unusual conditions masquerading as common lesions, which are refractory to conventional therapy.

**Ethical Clearance** – Not needed as it is case report

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**References**


A Ray of Hope - Photodynamic Therapy

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Abstract

Photodynamic therapy (PDT) involves utilization of a photoactive dye (photosensitizer), which gets activated upon irradiation of light to a specific wavelength in the presence of oxygen leading to the generation of free radicals, which eventually destroys the targeted cell. Applications of PDT in dentistry are growing rapidly: the treatment of oral cancer, bacterial and fungal infection therapies, and the photodynamic diagnosis (PDD) of the malignant transformation of oral lesions. PDT has shown good potential in the treatment of oral leukoplakia, oral lichen planus, and head and neck cancer. Photodynamic antimicrobial chemotherapy (PACT) has been efficacious in the treatment of bacterial, fungal, parasitic, and viral infections.

Key Words: Photosensitizer, Lasers and Head & Neck Cancers

Introduction

Photodynamic therapy (PDT) is defined as "the light induced inactivation of cells, microorganisms, or molecules." Also known as photo radiation therapy, phototherapy, or photo chemotherapy.

Prof. Hermann von Tappeiner coined the term "photodynamic", to describe oxygen-consuming chemical reactions in vivo. PDT involves the administration of photosensitizing compound and accumulation of sensitizer molecules in the target cells followed by a selective irradiation of lesion using visible light. Drug and light are individually non-toxic and in conjunction they mutilate tissues.

PDT has been approved for treating selective malignancies which are intraoperative and for intra-cavitary use in U.S., Canada, Germany, France, Japan and Netherlands. It has also been used in diseases like psoriasis vulgaris, warts, bacterial infections, diseases of the epidermal appendages, atherosclerosis and rheumatoid arthritis as an investigational treatment.

Historic Credits:

Oscar Raab, observed the death of *Paramecium caudatum* after light exposure in the presence of acridine orange.

Tappeiner and Jesionek in 1904, used topical eosin and visible light to treat skin tumours, condylomata and lupus vulgaris.

Policard, Figge, Auler and Banzer, Weiland and Manganiello, independent of each other, reported the tumour localization of haematoporphyrin.

Dougherty et al., spearheaded the lucrative use of PDT to treat cutaneous cancers and other malignancies.

Mechanism of Action:

Upon irradiation with light of an appropriate wavelength, the photosensitizer undergoes transition from low-energy-state "ground state" to a higher-energy "triplet state." The triplet-state sensitizer reacts with...
biomolecules to generate free radicals and radical ions or with molecular oxygen to produce singlet oxygen. These cytotoxic species in turn causes oxidation of cellular constituents such as plasma membranes and DNA, resulting in cell death. Clinically, PDT reaction is cytotoxic and vasculotoxic.

There are two proposed mechanism behind which PDT works:

Type I mechanism: Electron/hydrogen transfers directly from the photosensitizer producing ions or there is an electron/hydrogen removal from a substrate molecule to form free radicals. The free radicals react with oxygen rapidly and result in producing highly reactive oxygen species.

Type II mechanism: Electronically excited and highly reactive state of oxygen is released, which is termed as singlet oxygen. Since these reactions are mediated through singlet oxygen species, it is accepted as the major pathway in microbial cell destruction.

However in both the proposed mechanism, damage is created by oxygen tension as well as photosensitizer concentration.

The variables in PDT are:

1. Photosensitizers: This may be systemic or topical

2. Oxygenation of the tissues: Experimental attempts have been made at improving the effectiveness of PDT by manipulating the tumor O$_2$ content, but it has not been proven clinically as yet.

3. Light source: Lasers (coherent) and incoherent sources.

Photosensitizers:

Many natural and synthetic photoactive compounds have a photosensitizing effect.

Ideal photosensitizers are:

- High absorption coefficient in the spectral region of the excitation light
- A triplet state of appropriate energy (ET/95 kJmol$^{-1}$) to allow for efficient energy transfer to ground-state oxygen,
- High quantum yield of the triplet state (FT/0.4) and long triplet-state lifetimes (T/1 ms) since the efficiency of the photosensitizer is dependent on the photo-physical properties of its lowest excited triplet state, and
- High photo-stability.

Several kinds of photosensitizers may be associated with laser, but each will have applicability dependent on the absorption of the light and wavelength. Most photosensitizers are activated by light between 630 and 700 nm, corresponding to a penetration depth of 0.5 cm (630 nm) to 1.5 cm (at ∼700 nm).

The main photosensitizers found in the literature are: hematoporphyrin derivatives (620–650 nm), phenothiazine, like toluidine blue and methylene blue (620–700 nm), cyanine (600–805 nm), phytotherapeutic agents (550–700 nm), and hytalocyanines (660–700 nm).

Photofrin and hematoporphyrin derivates (620–650 nm) are the first-generation sensitizers whereas the 5-aminolevulinic acid (ALA), benzoporphyrin derivative, lutetium texaphyrin, temoporfin, tinethyletiopurpurin, and talaporfin sodium are the second-generation sensitizers. Foscan (temoporfin), the most potent second-generation photosensitizer, has been found to be 100 times more active than photofrin in animal studies.

5-Aminolevulinic acid can be applied intravenously, orally, or topically to allow greater tumor selectivity. 5-ALA is the sole photosensitizer to be applied topically. The remaining types can only be delivered intravenously. Topically applied ALA provides some advantages such as complete lack of systemic photosensitivity and lack of necessity of avoiding exposure to light after the treatment. A major disadvantage of topical application is the low treatment depth and penetration which is around 1–2 mm. Therefore, this approach is useful for the successful treatment of superficial tumors like premalignant and malignant lesions, leukoplakia and recalcitrant leukoplakia, corner of mouth, buccal, labial, gingival, mandibular oral mucosa, dysplasia, squamous cell carcinoma, verrucous hyperplasia, and extraoral verrucous carcinoma.

Light Source:

The activating light is most often generated by lasers or in some cases by arc lamps or fluorescent
light sources. Typically, the light must be of a specific wavelength as described by some; however, even broad-spectrum light can activate photosensitizers such as toluidine blue. Lasers are the most preferred sources of light used in PDT. The laser light can be focused through a fiber optic to deliver the proper amount of light. Most of the light photons at wavelengths between 630 and 800 nanometers (nm) travel 23 cm through the surface tissue and muscle between input and exit at the photon detector. As high-power lasers may induce trauma to surrounding tissues through thermal injury, low-power light with a photosensitizer is an attractive alternative therapy. Currently, diode lasers, which are much cheaper and more portable than metal vapor or tuned dye lasers, have become the preferred light source. The choice of photosensitizers used in dentistry is strongly dependent on the light source used. Currently, light sources of a specific wavelength mostly applied in photodynamic therapy are helium–neon lasers (633 nm), gallium–aluminum–arsenide diode lasers (630–690, 830, or 906 nm), and argon lasers (488–514 nm). The wavelengths of these sources range from visible light to the blue of argon lasers or from the red of helium–neon and gallium–aluminum–arsenide lasers to the infrared area of some diode lasers. High-level-energy laser irradiation is not used to activate the photoactive dye because a relatively low-level exposure produces a high bactericidal effect. Non-coherent light sources, such as tungsten filament, quartz halogen, xenon arc, and phosphor-coated sodium lamps, are used for the treatment of larger areas. Nonlaser sources such as light-emitting diodes (LED) are recently used in PDT because of their inexpensive, flexible, and lightweight properties.

PDT in treating Oral Lesions:

PDT is a relatively minimally invasive treatment form of malignant and premalignant lesions of head and neck including the oral cavity, the pharynx, the nasal cavity, and the larynx. These tumors are generally treated with conventional treatments, such as surgery, chemotherapy, and radiation, which may cause many side effects, including jaw pain, mouth sores, dysfunctional salivary glands, and difficulties in chewing, swallowing, and talking.

Selective tumor destruction and its minimal invasiveness are the main advantages of PDT over conventional treatments based on the preservation of healthy tissues.

Treatment regimen is appropriate for basically two groups of pathologies: these are early neoplastic lesions (premalignant and in situ carcinoma) and advanced recurrences after previous surgery or radiotherapy, respectively. Outcomes of the treatment are less satisfactory in the treatment of advanced carcinomas with PDT. This is probably due to a limited ability to adequately deliver laser light to the tumor bed. However, the possibility of an effective treatment of early-stage tumors and premalignant lesions with the preservation of the surrounding normal structures is often a great benefit.

Sharwani et al. examined patients with clinically suspicious oral leukoplaikia and showed that dysplastic lesions have significantly higher red fluorescence than benign oral lesions without changes in green autofluorescence.

Kubler et al. evaluated the effectiveness of mTHPC-mediated PDT in 25 patients with primary squamous cell carcinomas of the lip. During 12 weeks of the evaluation period, complete response has been shown by 24 of the patients (96%). Only one patient has shown a partial response and has been successfully retreated by mTHPC-mediated PDT, with a complete response at 7 months after retreatment. The functional results were excellent in all patients, without any signs of restricted mouth opening or impaired lip closure.

Copper et al. performed a study to examine the long term efficacy of mTHPC-mediated PDT in the treatment of 29 early-stage squamous cell carcinomas of the oral cavity and oropharynx. In 25 tumors (86 %), a complete remission of the primary tumor was obtained. Four lesions developed local recurrent disease after 1–6 months. All of these cases were salvaged by surgery and/or radiotherapy. None of the patients complained about impairment of mastication, swallowing, articulation, or speech after PDT.

Hopper et al. demonstrated that tumor clearance was accompanied by excellent cosmetic and functional results, without impact on the patient’s performance status. Adverse events in the immediate post-treatment phase were limited to pain (82 %) and swelling (10 %) at the treatment site due to the tumor necrosis caused by PDT. They concluded that mTHPC-mediated PDT is a safe and effective method of dealing with early oral
squamous cell carcinoma with a number of advantages over conventional treatments in terms of improved organ function and cosmetic appearance. Lin et al. [21] indicated that the laser light-mediated topical ALA-PDT is also very effective for oral verrucous hyperplasia (OVH) and oral erythroleukoplakia lesions (OEL). Therefore, they suggested that topical ALA-PDT using either LED or laser light may serve as the first-line treatment of choice for OVH and OEL lesions.

Sieron et al. showed that PDT is a useful and effective method for the treatment of premalignant lesions of the oral cavity and the palliation of advanced lesions of the oropharynx and larynx [15].

PDT, which may have immunomodulatory effects and may induce apoptosis in the hyperproliferating inflammatory cells that are present in psoriasis and lichen planus. This may reverse the hyperproliferation and inflammation of lichen planus. Aghahosseini et al. demonstrated that methylene blue (MB)-PDT seems to be an effective alternative treatment for the control of OLP. [22]

Candidiasis, caused by Candida species, is the most frequently encountered infection of the oral cavity. Immunocompromised states, diabetes mellitus, dental prostheses, xerostomia, and prolonged use of antibiotics or immunosuppressive drugs are the predisposing factors for oral candidiasis to ensue.

Antimicrobial photodynamic therapy has been evaluated as a promising method of treatment of oral candidiasis to overcome the problems associated with antifungal resistance. The mechanism of antimicrobial photodynamic therapy inactivation of fungi is completely different from that of antifungal agents. The reactive oxygen species promote perforation of the cell wall and membrane, thereby permitting the photosensitizer to translocate into the cell. Once inside the cell, oxidizing species generated by light excitation induce photodamage to internal cell organelles and cell death [1].

Dovigo et al. [23] in an in vitro study, attempted to describe the association of Photogem® (Photogem, Moscow, Russia) with LED for the photoinactivation of fluconazole-resistant (FR) and American Type Culture Collection strains of C. albicans and Candida glabrata. They treated suspensions of each Candida strain with five Photogem® concentrations and exposed them to four LED light fluences (14, 24, 34, or 50 min of illumination). It was observed that the fungicidal effect of PDT was strain dependent. Significant decreases in biofilm viability were observed for three strains of C. albicans and four strains of C. glabrata. The authors concluded that although antimicrobial photodynamic therapy was effective against Candida species, fluconazole-resistant strains showed reduced sensitivity to PDT. Moreover, single-species biofilms were less susceptible to antimicrobial photodynamic therapy than their planktonic counterparts.

Herpes is a common infectious disease that is caused by human herpes viruses. Several treatments have been proposed, but none of them prevents reactivation of the virus. Treatment with low-level laser therapy has been considered as an option in the treatment of herpes labialis, decreasing the frequency of vesicle recurrence and providing comfort for patients. The lesions have healed rapidly and no significant acute side effects have been noted [24].

Advantages of PDT

- Selective uptake of photosensitizers to particular tissue layers, precise directing of laser light using optical fibers,
- lack of scarring, and highly selective tissue necrosis, which is achieved by localizing the drug to the proliferating tissue, are the potential advantages of PDT.
- It can be performed in out-patient or day-case settings and repeated doses can be given without the need for total dose limitations.
- Resistance to treatment does not develop with repeated treatment [12].

Limitations of PDT

- PDT requires direction of the light to the appropriate site and tissue depth to be effective. Optimal light delivery with laser and collaboration and coordination between clinicians is complex and availability of the necessary light sources has been a problem. Currently, low-cost portable light sources are more readily available.
• PDT is an ablative procedure and does not yield material for histological diagnosis. Diagnosis should be made before treatment.

• Persistent skin photosensitivity, lasting for weeks with some photosensitizers, limits the use of PDT as a therapeutic regimen. PDT is also less effective in treating large tumors because the light cannot pass far into these pathologies. PDT is a local treatment and generally cannot be used to treat cancer that has spread widely (metastasized)\(^1\).

**Side effects**

The side effects of PDT depend on how the treatment is performed and it will vary between individuals. The side effects produced vary according to:

• What part of the body is treated
• The type of photosensitizing drug given
• The time between administration of the drug and light application
• The skin sensitivity to light following treatment

The major side effect of PDT is residual systemic photosensitization, which lasts for several days or weeks depending on the administered photosensitizer. When administered systemically, residual skin photosensitivity may ensue for a period.

Daylight may be a means of activation of photosensitizer, resulting in first- or second-degree burns. The patients are therefore instructed to avoid exposure to bright light or sunlight until the drug is completely eliminated. Also, skin and eyes should be protected from intense exposure of light.

Furthermore, though PDT treatment is not a painful procedure, pain may be experienced by patients several hours after PDT. Pain relief medications prior or after the laser treatment may be advocated. When used for the treatment of tumors, though damage to health tissues is minimal, burns, swelling, pain, and scarring in the nearby tissues are likely.

Other side effects that are less frequent are coughing, trouble swallowing, stomach pain, painful breathing or shortness of breath, allergic reactions, change of liver parameters, etc.\(^{[12]}\)

**Conclusion**

Applications of PDT in dentistry are growing rapidly such as the photodynamic diagnosis of malignant transformation of oral lesions and the treatment of head and neck cancer, as well as bacterial and fungal infections.

The advantages of photodynamic therapy compared with surgery or radiotherapy are reduced long-term morbidity and the fact that photodynamic therapy does not compromise future treatment options for recurrent, residual, or another primary disease. Based upon the present analysis of pertinent literature, where tumors are concerned, PDT appears to be a promising technique for early neoplastic lesions (premalignant and in situ carcinoma) and advanced recurrences after previous surgery or radiotherapy. Also, superficial infections as well as bacterial and fungal infections seem to be areas which hold promise to incorporate photodynamic therapy as a treatment option more frequently in the future. Further evidence-based accumulation of data is definitely required to make a definite statement.

In conclusion, PDT is a useful modality for the treatment of head and neck tumors and precancerous lesions which present inform or under conditions that pose considerable difficulties in their management by conventional approaches.

**Ethical Clearance** – Not needed as it is case report

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**References**


Dentigerous Cyst Masquerading as Mucocele in Right Maxillary Sinus- A Rare Case Report

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Abstract

Dentigerous cyst is the most common type of developmental odontogenic cyst, which develops around the crown of an unerupted tooth. The dentigerous cyst occurs mostly 95% with unerupted permanent dentition and 5- 6% with unerupted supernumerary teeth. Here we report a case of dentigerous cyst mistakenly diagnosed as maxillary mucocele by an ENT specialist. Hence ENT specialist, oral physician, and radiologist should be aware of such presentation of dentigerous cyst when maxillary sinus is involved.

Keywords: Dentigerous cyst, supernumerary tooth, mucocele, maxillary sinus.

Introduction

Dentigerous cyst is the second most common type of odontogenic cyst after radicular cyst1. It occurs commonly between 20 to 40 years with a male predilection. It is more commonly associated with mandibular third molars followed by maxillary third molars, maxillary canines and premolars.2

Dentigerous cyst involving anterior maxilla is very rare. About 5% of all dentigerous cysts are attributed with supernumerary teeth. Pitts in 1924 first described the occurrence of dentigerous cyst with supernumerary teeth and Lustman and Bodner in 1988 observed a case of dentigerous cyst in association with the supernumerary teeth3. They are often painless and remains silent until there are secondarily infected4. When a dentigerous cyst occurs in the maxilla it causes displacement of teeth into the maxillary sinus or involve sinus by causing nasal obstruction and discharge from the nose4.

We present an unusual case of dentigerous cyst mimicking as mucocele in the right maxillary sinus with two unerupted supernumerary teeth in the anterior maxilla.

Case Report

A 21 year old male patient diagnosed as mucocele of right maxillary sinus was referred to us by an ENT specialist to give dental fitness before surgery. Patient had nasal obstruction and discharge from his right nostril for which he consulted ENT specialist. After examination he was advised for CT and CT revealed a soft tissue mass (HU -30) possibly mucocele or polyp with complete opacification of the right maxillary sinus with expansion and thinning of the anterior wall of the sinus (Figure 1).

On examination patient had pain along with swelling in his right side of the face for the past one month. Swelling started one month before and has gradually increased in size to attain the present size. Patient also revealed watery discharge from the right nostril and blockage during the night.

All the vital parameters were found to be within normal limits. On extra oral examination a mild diffuse solitary swelling was present in relation to the right side of the face. Intra-oral examination of hard tissues revealed dental caries in relation to 46, 47 with
generalized Grade (+) stains & calculus. Soft tissue examination revealed a mild diffuse swelling seen in the right buccal vestibule from the distal aspect of 14 regions to mesial aspect of 17 regions. Also obliterating of the buccal vestibule seen. It approximately about 1 x 1.5 cm with ill-defined margins and surface smooth. On palpation the swelling was tender, cystic in consistency, slightly compressible but not reducible. No blood or pus exudate seen. Expansion of buccal cortex was present (figure 2).

A maxillary Occlusal radiograph was taken which showed a well-defined radiolucency encircling the apical portion of 21, 11,12,13,14 region with two small teeth like structures embedded in the maxillary bone. One structure was present in relation to the lateral aspect of 12 and 11 and the other in relation to the left side of nasal septum (Figure 3). A thorough examination of the CT axial sections revealed radiopaque tooth like structure in the anterior maxillary bone along with perforation of the buccal cortex (Figure 4). FNAC was performed which showed clear straw-coloured fluid, that confirmed the diagnosis of cyst (figure 5). A provisional diagnosis of odontogenic cyst associated with impacted supernumerary teeth was considered. Patient and the ENT specialist was explained about the diagnosis.

Incisional biopsy was done in relation to 14, 15 regions (figure 6). The histopathological report revealed that there was 3 to 6 layers of cystic lining consisting of non-keratinized stratified squamous epithelium with cholesterol cleft seen in the connective tissue which confirmed the diagnosis of dentigerous cyst (figure 7). The tooth was removed with surgical enucleation of cystic lining and sinus content was cleared. Endodontic treatment was done from 21 to 16. Follow-up was done periodically. After 1 year of follow up patient revealed discharge from the surgical site. IOPA (FIGURE 8), Occlusal (FIGURE 9) and OPG (FIGURE 10) were taken. Curettage was done and the patient was advised to undergo RE-RCT in 13 14 as it was obturated short of apex. Post-operative PNS view of right maxillary sinus showed no haziness was present (FIGURE 11).
FIGURE 4: CT reveals unerupted morphologically altered two tooth structure present in the maxillary bone along with perforation of buccal cortex.

FIGURE 5: Clear straw coloured fluid obtained by aspiration

FIGURE 6: Biopsy done in relation to 14, 15 region.

FIGURE 7: Histopathological image showing epithelial lining and connective tissue of cyst

FIGURE 8: IOPA of 11, 21 reveals ill-defined radiolucency seen in relation to apical portion of 11 & 21.

FIGURE 9: Maxillary occlusal radiograph shows diffuse ill-defined radiolucency present in the palatal region.
Discussion

Dentigerous cysts account for about 16.6% of all jaw cysts. About 95% of these cysts involve permanent dentition and only 5% are associated with supernumerary teeth. Mesiodens was first named by Bolk in 1917, is the most frequent type of supernumerary tooth and is situated in the maxillary anterior incisors region. It is a rare entity with a prevalence of 0.15–1.9% with slight male predilection6.

Radiographically, the dentigerous cyst shows a well-defined unicocular radiolucency with sclerotic borders that is associated with the crown of an unerupted tooth, although, once infected, it may show ill-defined borders. The cyst-to-crown relationship shows several radiographic variations such as central, lateral and circumferential7. Panoramic radiograph, IOPA, Occlusal radiograph, and Water’s view are commonly used for investigating the dentigerous cyst involving the maxilla and sinus. The structure of a tooth present in the anterior maxilla cannot be clearly detected on panoramic radiographs due overlapping structures present. In our case, we used maxillary occlusal radiograph and CT scan for detailed evaluation of dentigerous cyst associated with unerupted supernumerary teeth. CT scan showed clear visualization of size, extent, invasion of the cyst into the maxillary sinus and surrounding structure.

The differential diagnosis for a dentigerous cyst in our case includes odontogenic keratocyst, median palatine cyst, nasopalatine duct cyst, radicular cyst and adenomatoid odontogenic tumor. However, mucocele, retention cyst and pseudocysts are also considered in the differential diagnosis when maxillary sinus expansion involved. All these diagnoses were excluded due to the presence of unerupted supernumerary teeth in the palate.

The standard treatment for a dentigerous cyst is enucleation of cyst followed by extraction of the cyst associated with an impacted or unerupted tooth. For extremely large, marsupialization may be done. In the present case enucleation cyst with the removal of both the unerupted supernumerary teeth was performed. The potential complications of DC cyst include transformation into ameloblastoma, squamous cell carcinoma and intraosseous mucoepidermoid carcinoma8.

Conclusion

Dentigerous cyst involving the supernumerary tooth in maxilla remains asymptomatic and once cyst is secondarily infected it may cause expansion of jaw, displacement of teeth, invasion of the cyst into the sinus and nasal blockage. Initially these cyst present as mucocele or polyp in the sinus and when the sinuses are completely opaque in radiographic findings it is necessary to rule out any unerupted teeth present in maxilla in order to avoid unnecessary surgery.

Ethical Clearance – Not needed as it is case report

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Conflict of Interest – Nil

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Reliability of Saliva as a Diagnostic Fluid

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Abstract

Saliva can be used as a diagnostic tool for the detection of various systemic and oral diseases. There has been a long standing debate that saliva based diagnostics can be employed in our day to day practice. The reliability of saliva is equal to that of serum. Patients have a psychological fear for any blood based examinations. Saliva overcomes such fear as it is collected noninvasively with accurate results. This article focuses why not saliva be an alternative fluid to blood??

Keywords – Saliva, Serum, Diagnostics

Introduction

In the current scenario, with a plethora of new diseases, a great demand exists for the need of a more cost effective, non-invasive diagnostic platform with more accuracy and also comfortable to the patient. Saliva, being a magical fluid in the oral cavity, is one of the most important and versatile body fluids, that has various properties which substantiates it as an efficient diagnostic tool, for the early detection of various systemic and oral diseases.

Composition and Properties of Saliva:

Saliva contains 99% of water and 1% of other organic and inorganic components including enzymes, immunoglobulins, antimicrobial factors, glycoproteins, glucose, nitrogenous products, traces of albumin, polypeptides and oligopeptides, and a variety of electrolytes. In addition, it also contains oral mucosal transudate, mucus of the nasal cavity and pharynx, non-adherent oral bacteria, food debris, desquamated epithelial cells, blood cells, and traces of medications or chemical products. It exhibits gustatory function and helps in primary digestion of carbohydrates and fats. It acts as a buffer system to maintain homeostasis in the mouth. It also exhibits lubricative and protective functions¹.

Saliva Vs Serum:

The acinar cells of the salivary glands are highly permeable and are enveloped by capillaries which permits free exchange of blood based molecules into the saliva. This transcellular and paracellular movement of blood derived products could potentially influence the molecular contents of oral fluids². Thus consequently the circulating biomarkers of a disease absorbed by the salivary glands may possibly alter the biochemical composition of saliva. Hence saliva may act as an excellent substrate through which the individuals disease status can be determined.

There are various advantages of collecting saliva for diagnostic purposes when compared to serum. It is a non-invasive method for sample collection, easy to use, inexpensive and a safer technique. It gives real-time diagnostic values and there is no need for trained medical staff. In addition to this multiple samples can be obtained easily, Collection and screening can be done at home. It is also more economical in sampling, shipping and storage when compared to serum³.

Various oral samples include saliva, gingival crevicular fluid (GCF), oral swabs, dental plaque, and volatiles. The most reliable type of sample is a swab that contains DNA which is used to analyse disease related DNA sequences and Single nucleotide Polymorphisms (SNP)⁴.
Inspite of so many advantages, a controversy still exists whether to completely rely on it for diagnosis, as the quantity of analytes and biomarkers expressed in saliva are diminished when compared to serum. However with the help of various molecular methods and nanotechnology we can easily overcome the issue.

ROLE IN DETECTING SYSTEMIC DISEASES:

Saliva provides a plethora of biomarkers which is helpful in detecting various systemic diseases like diabetes mellitus, cardiac disorders, infectious diseases and even autoimmune diseases like cystic fibrosis. Coronary artery diseases and acute myocardial infarction may be triggered due to deposition of fat tissues in the vessel wall induced by inflammation. Thus there is always an increase in the serum cholesterol levels and C-reactive protein levels. Studies also prove that, salivary CRP levels were found to correlate with plasma CRP levels obtained from blood samples of a population at risk for cardiovascular complications. It is also possible to detect cardiac troponin, a biomarker for the detection of Acute Myocardial Infarction in saliva that is released in response to cardiac cell necrosis. Research show the presence of myoglobin and myeloperoxidase in myocardial infarction patients which highly correlate with their ECG findings.

Diabetes mellitus is also one of the most common diseases which is prevalent in the Indian subcontinent. Saliva of diabetic patients is known to express around 52 types of altered proteins in high levels. Hence salivary proteomics is an interesting option for diabetic patients who wish for non-invasive diagnostic procedure.

Certain salivary biomarkers were exclusively detected in patients with end stage renal diseases which includes cortisol, nitrite, uricacid, sodium, chloride, pH, amylase and lactoferrin. Also with the help of salivary nitrates and uric acid levels, indication for hemodialysis can be determined easily in chronic kidney disease patients.

Various autoimmune disorders like cystic fibrosis and Sjogeren's syndrome can be detected in saliva. Salivary analysis shows increased concentrations of sodium, chloride, elevated levels of IgA, IgG, lactoferrin, albumin, various inflammatory mediators like eicosanoids, PGE2, thromboxane B2, and interleukin-6 in patients with Sjogeren's syndrome.

Saliva harbours a wide range of biomolecules including microbial antibodies, which takes the diagnosis of infectious diseases to a next level. Saliva primarily contains IgA or secretory antibodies which is derived from the saliva itself. It also contains IgG and IgM antibodies which are derived from the serum in response to infections. A saliva-based enzyme-linked immunosorbent assay (ELISA) is available to screen suspected HIV patients. Around 25% of HIV-positive individuals are not aware of their infection. They account for the majority of new incidences of HIV transmission events every year. This test is highly accurate and might help in screening more new cases in a easier way.

Also investigations have demonstrated the efficacy of hepatitis A virus (HAV) immunizations by assessing salivary IgG concentrations. Unlike HAV, both hepatitis B virus (HBV) and hepatitis C virus (HCV) are commonly associated with chronic liver diseases and can eventually result in severe liver-related complications such as cirrhosis and hepatocellular carcinoma. These antibodies can be easily detected in the saliva. In addition, using antigen capture methods, IgA antibodies specific to dengue virus have also been found in saliva. Likewise many viruses, including Ebola virus, HSV, EBV, HHV, and CMV, are most successfully detected using PCR methodologies.

Also bacterial infections like H. pylori and M. tuberculosis produces a type of IgG which can be detected in saliva of chronic gastritis and peptic ulcer patients.

Saliva plays a vital role in detection and monitoring of drugs. Drug levels of lithium, carbamazepine, barbiturates, benzodiazepines, phenytoin, theophylline, and cyclosporine can be estimated through saliva as these drugs diffuse into the body fluids. Legal drug levels of alcohol and tobacco, and illicit drug levels of marijuana, cocaine, and amphetamines can also be determined in cases of drug and substance abuse.

As blood sampling by using needle-stick is not stress free, recent studies rely on the use of saliva as a useful tool for the assessment of hormonal response especially cortisol and testosterone to acute exercise or training.

Role in oral diseases:

Saliva is a useful platform to monitor various oral diseases and conditions. Most common diseases of the oral cavity, dental caries and periodontitis are monitored by estimating the level of bacteria like Streptococcus
sp., Lactobacillus and other periodontal pathogens. The total antioxidant capacity of saliva is reduced in case of any kind of oxidative stress to the oral cavity. Oral infectious diseases of bacterial, viral or fungal etiology can be detected.

Oral cancer biomarkers are also detected in saliva, which might help in early diagnosis of the disease reducing its fatality. Some of them include, oncogenes (e.g. C-myc, c-Fos, C-Jun), anti-oncogenes (e.g. p53, p16), cytokines (e.g. TGF-β1, IL-8, and IL-1 β), growth factors (e.g. VEGF, EGF and IGF), extracellular matrix-degrading proteinases (MMP1, MMP2, MMP9), hypoxia markers (HIF-α, CA-9), epithelial-mesenchymal transition markers (e.g. E-cadherin, N-cadherin and β-catenin), epithelial tumor factors (CYFRA 21-1), cytokeratins (CK13, 14 and 16), microRNA molecules and hypermethylation of cancer-related genes.

Future Directions:

Similar to the availability of salivary diagnostic kit for HIV, Saliva assays may soon be marketed for antibodies to hepatitis A and B and to measles, mumps, and rubella. The saliva test for markers of breast cancer, will also be marketed by Medic Group USA, may be available in the recent years. The future requires a collaboration between imaging and biomarker-based investigations. When biomarkers will provide quantifiable characteristics, imaging will provide special features of the disease area and amplify the biomarker visualization. A comprehensive database of biomarkers needs to be developed, integrating genomics, proteomics, metabolomics, and imaging features of a broad spectrum of disease states.

Conclusion

Thus saliva is a reflection of the whole body and contains a huge profile of biomolecules that aids in easy diagnosis of various systemic and oral diseases. Proper knowledge about the biology of saliva and its function will help in early detection of diseases and prompt treatment thereby reducing the morbidity and mortality of ant disease.

Ethical Clearance – Not needed as it is case report

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Interferons in Oral Diseases- A Review

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Abstract

The Interferons are a group of multifunctional proteins involved in the activity of the immune system. They are antiviral agents. There are mainly three types of Interferons in the humans namely Interferon Alpha (IFNA) Interferon Beta (IFNB) and Interferon Gamma (IFNG). Interferons (IFNs) came into limelight with their use in hepatitis infections. It has been used in various cancer treatment modalities. This article throws light on its applications in oral diseases particularly in oral potentially malignant disorders.

Key Words – IFNs, Diseases, Cancer.

Introduction

What are Interferons?

Interferons are a group of proteins called cytokines produced by white blood cells, fibroblasts, or T-cells as part of an immune response to a viral infection or other immune trigger. The name of the proteins comes from their ability to interfere with the production of new virus particles. They have effect on immune system and inhibit the tumor growth. They provide signaling to the immune system during viral infections. They are broadly classified into two types Type I IFNs namely IFN-α secreted in direct response to a viral infection predominantly synthesized by leukocytes and IFN-β synthesized by many cell types in particular by fibroblasts. Type II IFN or IFN-γ which is synthesized by activated T lymphocytes and natural killer cells in response to the recognition of infected cells as reviewed by Goodbourn et al. Cytokines due to their immunomodulatory properties are more commonly used in haematology, oncology, hepatology and dermatology.

Over hundred cytokines have already been identified and the literature continually informs of new discoveries (Xing and Wang 2000).

History of Interferons

The first interferon was discovered in 1957 by Alick Isaacs and Jean Lindenmann. During their investigation, they found that virus-infected cells secrete a special protein that causes both infected and noninfected cells to produce protein that prevent viruses from replicating. They named the protein interferon because it interferes with infection. Initially, scientists thought there was only one interferon protein, but subsequent research showed that there are many different interferon proteins. In 1986, interferon-alpha became the first interferon to be approved by the Food and Drug Administration (FDA) for hairy-cell leukemia. In 1988 was also approved for the treatment of genital warts, proving effective in nearly 70% of patients who do not respond to standard therapies. In that same year, it was approved for treatment of Kaposi’s Sarcoma in patients suffering from AIDS. In 1991, interferon-alpha was approved for use in chronic hepatitis C Hodgkin’s lymphoma and malignant melanoma. In 1993, another class of interferon, interferon-gamma was approved by FDA for the treatment of a form of multiple sclerosis. Interferon-gamma may also have therapeutic value in the treatment of leishmaniasis, a parasitic infection that is prevalent in parts of Africa, America, Europe, and Asia.
How Interferons work?

Interferons work to stop a disease when they are released into the blood stream and then bind to cell receptors. After binding, they are drawn inside the cell's cytoplasm, where they cause a series of reactions that produce other proteins that fight off disease. Scientists have identified over 30 disease fighting proteins produced by interferons. In contrast to antibodies, interferons are not virus specific but host specific. Thus, viral infections of human cells are inhibited only by human interferon.

Interferons and the immune system

In addition to altering a cell’s ability to fight off viruses, interferons also control the activities of a number of specialized cells within the immune system. Type I interferons can either inhibit or induce the production of B lymphocytes. Interferon-gamma can also stimulate the production of a class of T lymphocytes known as suppressor CD8 cells, which can inhibit B cells from making antibodies. Another role of interferon-gamma is to increase immune system function by helping macrophages to function. These scavenger cells attack infected cells and also stimulate other cells within the immune system. Interferon-gamma is especially effective in switching on macrophages to kill tumor cells and cells that have been infected by viruses, bacteria and parasites.

Premalignant lesions and Interferons

The global incidence of oral cancer is about 500,000 cases per year with a mortality of 270,000 cases. Some oral cancers initiate as denovo lesions while some lesions are preceded by oral premalignant lesions and conditions. Many oral SCCs develop from premalignant conditions of the oral cavity. The role of IFNs in developing a premalignant lesion was studied by Urata et al. and Sato et al. IFN activity were increased the sera of patients with oral potentially malignant lesions when compared with the controls.

Interferons in OSMF

OSMF is characterized by fibrosis at the submucosal level, that ultimately leads on to progressive restricted mouth opening. In a study by Haque et al., it was highlighted that IFN-γ is an anti-fibrotic cytokine. They conducted this study to investigate in vitro the action of IFN-γ on fibroblasts stimulated by arecoline in OSMF patients. Furthermore, they also studied the effect of intra-lesional administration of IFN-γ on the fibrosis in those patients. They also analyzed the inflammatory cell infiltrates and the cytokine levels before and after the treatment in the lesional tissue. The results revealed that the increased collagen synthesis in response to arecoline was inhibited by IFN-γ (0.01-10.0 U/ml) in a dose-related manner. In an open uncontrolled study, administration of intra-lesional IFN-γ showed improvement in the patients’ mouth opening, with a net gain of 8 ± 4 mm (42%). In addition, the patients also reported reduced dysesthesia and improved suppleness of the buccal mucosa. Reduction in the inflammatory cell infiltrate, and cytokines level was observed in the post-treatment immunohistochemistry. Hence, the effect of IFN-γ on collagen synthesis acts as a key-factor in the treatment of such patients, and thus intra-lesional injections of IFN-γ might act as a significant therapeutic modality in OSMF.

Interferons in Oral lichen planus

OLP is an immunologically mediated lesion present in a wide variety of patterns have a 0.8% chance of turning into malignancy. The study was conducted to investigate the potential involvement of IFN-γ in the pathogenesis of OLP in biopsy specimens from 10 OLP patients, the topographic distribution of cells expressing IFN-γ mRNA was determined by an in situ hybridization technique. Approximately 1% or fewer lesional cells were found to be IFN-γ mRNA-positive, and the majority of these cells were found lining the basement membrane. A slightly higher number of phytohemagglutinin (PHA)-induced IFN-γ-producing cells were found in the blood from 11 other OLP patients. IFN-γ response toward Candida albicans was same in OLP and control blood cells, highlighting normal immunological function in the OLP patients. These findings suggest that T-cells activation and IFN secretion occur locally and are not seen to reflect in the peripheral blood. It is also inferred that the disease is regulated by less number of T cells.

Interferons in Leukoplakia

It is now well established that there is an association between human papillomavirus (HPV) virus and proliferative verrucous leukoplakia. HPV being a virus has the capability to induce IFNs. IFN-α delays the tumor growth.
**Conclusion**

Since their discovery about 60 years ago, IFNs have been used in available protocols for clinical treatment of viral diseases. IFN-α, IFN-β are currently used to treat hepatitis B and C viral infections. Although initial research shows that interferons are beneficial in treating premalignant oral diseases. Nevertheless, it is also evident that additional research is needed to more clearly explain the oromucosal administration and to determine optimal doses and dosing schedules, and to identify disease indications and circumstances in which beneficial effects can be most reliably achieved.

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Review Article

Periosteal Reactions and Its Significance

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Abstract

The periosteum covering the bony cortex consists of an outer and inner layer. The inner layer of the periosteum is the site of separation and subperiosteal haemorrhage because it’s less adherent. When the bone is insulted, it results in periosteal reaction. There are different variables that affect the periosteal response appearance like the rapidity of the phase of the disease, intensity, duration of the injury and age of the patient. The appearance and the pattern of periosteal reaction aids the imaging characterization of bone lesions and assesses their aggressiveness and their differential diagnosis, but not specific for a particular diagnosis. This article outlines the forms and patterns of periosteal responses that can guide to the diagnosis of underlying disease process.

Keywords: Periosteal reaction, bone neoplasm, periostitis, radiology, periosteum.

Introduction

Bones have a thin outer membrane called the periosteum. The fundamental response of bone to disease processes or other insults lead to periosteal elevation from the cortex followed by new bone formation by vascular proliferation and thickening of the bone.¹ ² Periosteal new bone formation, periostitis, and reactive bone formation are its different terms. Periosteal reaction (PR) occurs when the cortical bone is insulted by various insults like tumor, infection, trauma, certain drugs, venous stasis and some forms of arthritis.³ Each periosteal reaction may follow a particular pattern and may provide a clue for differentiating benign and malignant disease process. Once the new bone is ossified, PR is observed on conventional radiography, CT, MRI, ultrasound, and bone scintigraphy in the early stages. It is more aggressive in children than adults because the periosteum is active and is less attached to the cortex.⁴

Types of Periosteal Reactions

- Nonaggressive- Bone deposition has a slower progression and is less intense with an uninterrupted pattern. Commonly seen after healing or treatment ¹ ³
- Thin
- Solid
- Thick
- Irregular
- Septated
- Aggressive- These are interrupted patterns and has rapid bone deposition over a short period of time, which deny the periosteum time to develop new bone.
- Laminated (onionskin)
- Spiculated
- Perpendicular/hair-on-end
- Sunburst
- Disorganized
- Codman’s triangle

Solid periosteal reaction- It is a nonaggressive periosteal elevation representing a benign, slow process with continuous new bone formation.¹ The matrix between a single layer and the cortex or between numerous lamellations ossifies as the insult continues, resulting in solid PR. The main characteristics are the uniform
density and the absence of change in appearance over time. It may be thin (figure 1) or solid (figure 2), thick irregular (figure 3) straight or undulating.\textsuperscript{1,2} Thick PR (ie, greater than 1 mm) may be associated with a benign lesion reflecting a chronic persistent insult. Thin simple periosteal elevation may also be seen in either benign or malignant lesions. It can be seen in stress fractures, osteomyelitis, osteoid osteoma, chondroblastoma, LCH, and healing fractures.\textsuperscript{5} Aggressive tumours like osteosarcoma, Ewing’s sarcoma, and metastases are rarely associated with solid PR.\textsuperscript{6} It may also be seen in post-treatment of malignant tumours.

\textbf{Septated periosteal reaction} – It is a non-aggressive PR. In some cases of the subperiosteal aneurysmal bone cyst, the reactive bone may have well-defined septations mimicking an aggressive lesion.\textsuperscript{7} (Figure 4)

\textbf{Laminated periosteal reaction} – In multilamellar PR, sheet-like layers of mineralized new bone is deposited around the cortex separated by loose
connective tissue and vascular dilatation, forming an onion skin or laminated appearance. (Figure 5) It was originally thought that alternating cycles of fast and slow bone injury resulted in the concentric layers. However, the latest studies indicate that various layers are formed in the adjacent soft tissue due to the modulation of fibroblast sheets, which develop the osteoblastic potential to create new bone sheets. It occurs in benign tumours like Garre’s osteomyelitis, LCH, aneurysmal bone cyst and malignant conditions with aggressive cellular tumours like Ewing sarcoma, osteosarcoma, pulmonary hypertrophic osteoarthropathy, chondroblastomas and rarely with metastases. It is also seen in premature infants.

Figure 5: Onion skin or laminated appearance

**Spiculated periosteal reaction** - It is an aggressive PR in which the fine spicules of periosteal bone is projected from the cortex. Linear new bone spicules originate from ossification along newly formed periosteal vascular channels and fibrous bands (Sharpey’s fibers) stretched out of the cortex. (Figure 6) The spicules themselves are not tumour but they course along the direction of tumour growth. The spicules associated with malignancy are long and slender, whereas spicules associated with the benign disease are short and thick.

Figure 6: Hair on end appearance periosteal reaction

**Sunburst periosteal reaction** - The bony spicules radiate or fan out from the cortex in a divergent pattern instead of perpendicular to the cortex giving a sunburst or sunray appearance. (figure 7) In this aggressive periosteal reaction, the extension of spicules into the bone epicenter is seen. It is a sign of malignancy as is frequently associated with osteosarcoma with cortical destruction, secondary to prostatic carcinoma, rarely in aggressive osteoblastic metastasis and is associated with metastatic neuroblastoma in pediatric patients. It may be observed in benign lesions such as hemangiomas and osteoblastomas.

Figure 7: Sunburst appearance
Codman’s triangle- It is an aggressive PR and it is a specific category of a disrupted version of the lamellar periosteal reaction.\(^1\)\(^,\)\(^8\) (figure 8) When periosteum is locally elevated off the cortex and destroyed by the leading or extreme edge of tumor, pus, or hemorrhage, it is called Codman’s triangle and the remaining periosteal cuff is seen at the lesions’s margin.\(^5\)\(^,\)\(^9\) It is usually tumor-free, but secondary infiltration can occur through the open end.\(^2\) It can be observed in active or aggressive benign tumours, osteosarcomas and other aggressive primary malignant bone tumors or bone metastases, in osteomyelitis, in trauma, and in benign, but active tumors, such as aneurysmal bone cysts and in Ewing’s sarcoma.\(^1\)\(^,\)\(^4\)\(^,\)\(^8\)

![Figure 8: Codman’s triangle](image)

Disorganised/complex periosteal reaction- A combination of different types of PR may also result in complex patterns. This bizarre and disorganised appearance is by the random distribution of reactive bony spicules. It occurs in leukemia, lymphoma, malignant lesions, a benign lesion with malignant changes, the aggressive forms of osteosarcoma and as a complication of a benign or malignant lesion by a fracture or infection.\(^5\)\(^,\)\(^10\)

Conclusion

The knowledge about the types of periosteal reaction observed on the conventional radiographs and other radiographic modalities is necessary as it guides the practitioner in diagnosing the lesion present.

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Source of Funding – Nil

Conflict of Interest – Nil

References

Soft Tissue Applications of Lasers- A Review of Literature

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Abstract

Laser is a special light source that has a higher power and better quality of beam compared to the other light sources. There are certain features inherent to each type of laser such as the spot size, wavelength, or radiance that is important for the kind of application intended. Since its first use in 1960, lasers are now evolved to be used in all aspects of dentistry. The aim of this review is to describe the application of lasers in oral soft tissue procedures. Soft tissue lasers are becoming popular among the clinicians due to their potential value in surgical procedures providing surface sterilization, dry surgical field and increased patient acceptance. Lasers are effective in ablation of various potentially malignant disorders, obtaining biopsy, periodontal plastic surgeries and providing incisions in surgical conditions.

Keywords: Carbon dioxide laser, laser, Nd:YAG laser, selective absorption, soft tissue

Introduction

In 1917, the theory of “stimulated emission” was put forward by Albert Einstein, stating that photons could “stimulate” the emission of another photon that would possess identical properties to the first. Townes and Schawlow worked on a study together that led to the development of LASER (Light Amplification by Stimulated Emission of Radiation). In 1962, laser was used in dentistry for the first time by Goldman. Since 1962, lasers have been used for soft tissue surgery of oral cavity with significant advantages compared to other treatment modalities. The first experiment with lasers in dentistry was reported in a study about the effects of a pulsed ruby laser on human caries (Husein 2006).

The most common lasers used in surgery emit wavelengths in the infrared part of the spectrum: Nd:YAG (λ=1,064nm), Er:YAG (λ=2.94μm), and CO2 laser (λ=10.6 and 9.6μm). These lasers cause significant tissue heating due to the thermal energy produced, causing denaturation of proteins, decomposition of tissue, micro explosion of cell water and charring. Argon lasers emit wavelengths within the visible portion of the spectrum (between 458 and 515nm), whereas excimer lasers emit wavelengths in the ultraviolet part of the spectrum. The lasers within the ultraviolet spectrum have the ability to ionize tissues. Diode lasers emit wavelengths of 670 to 1551nm. With the recent advances and developments of wide range of laser wavelengths and different delivery systems, lasers could be applied for the dental treatments including periodontal, restorative and surgical treatments (Lee 2007).

The aim of this review is to describe the soft tissue applications of lasers in dentistry.

Table 1: Different types of lasers used in dentistry

<table>
<thead>
<tr>
<th>Laser</th>
<th>Wavelength</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARGON</td>
<td>488 nm, 514 nm</td>
<td>Pigmented lesions, Vascular anomalies, Plastic surgery</td>
</tr>
<tr>
<td>DIODE</td>
<td>620-900 nm</td>
<td>Periodontal surgery, Bleaching, Photodynamic therapy, Soft laser therapy, Other soft tissue procedures</td>
</tr>
<tr>
<td>CO2</td>
<td>10,600 nm</td>
<td>Soft tissue procedures</td>
</tr>
<tr>
<td>ND:YAG</td>
<td>1,064 nm</td>
<td>Soft tissue procedures, Periodontal surgery, Pigmented lesions</td>
</tr>
<tr>
<td>HO:YAG</td>
<td>2,100 nm</td>
<td>Arthroscopic surgery, soft tissue surgery</td>
</tr>
<tr>
<td>ER,CR:YSGG</td>
<td>27Ba nm</td>
<td>Bone surgery, Periodontal surgery, Cavity preparations</td>
</tr>
<tr>
<td>ER:YAG</td>
<td>2944 nm</td>
<td>Bone-surgery, Skin resurfacing, Cavity preparations</td>
</tr>
</tbody>
</table>
Applications of lasers

Lasers are widely used in dentistry for cavity and root canal preparations, scaling and root planing, gingival and periodontal surgeries, coagulation and hemostasis, biopsies, excision of tongue lesions, TMJ disorders, exposure of implants and preprosthetic surgery.\(^3\)

Diagnosis of lesions

Laser capture microdissection (LCM) greatly improved the efforts in describing the molecular basis of malignancy. In early 1970s primitive UV laser was first used by Isenberg et al. but their approach required massive space occupying instruments to dissect subpopulations of cell types. The first commercialized system was devised by Lance Liotta, Emmert-Buck and co-workers in mid 1990s for accurately and efficiently dissection of cells from histo-logical tissue sections of solid tumors (Domazet et al. 2008).\(^4\) This technique variably helps in early detection of oral squamous cell carcinoma by detecting the biomarkers and establishing protein fingerprint models (Mehrotra & Gupta 2011).\(^5\)

Low level laser therapy

Low level laser therapy (LLLT) is defined as laser treatment in which the energy output is low enough to produce nonthermal and biostimulatory effects. It is a new treatment modality and has the advantages of being painless with no side effects. LLLT has effectively used in pain during orthodontic therapy, acceleration of healing process in wound, reduction of bacterial load in ulcerative conditions like aphthous ulcer, infections etc. (Hong-Meng et al. 1995)\(^6\)

Effects of laser on soft tissues

Laser can lead to warming, welding, coagulation, protein denaturation, drying, vaporization and carbonization causing the histological changes such as intracellular vacuolization, cellular hyper-chromatism and loss of intracellular structure, with the degree of charring of the tissues. (Kende et al. 2011)\(^7\)

Application On Oral Lesions

Recurrent aphthous ulcers appear as a yellowish white pseudo membrane surrounded by erythematous halo. The ulcer is painful on palpation. Recently Low Level Laser Therapy (LLLT) has been used. It helps in immediate pain relief and accelerates wound healing. According to De Souza et al, 75% of the patients reported that there is a significant pain relief in the same session after laser treatment and the lesion is totally regressed in 4 days. When steroids are used, it takes 5-7 days for regression.\(^8\) Bladowski et al also found that diode laser used at low levels reduces the wound healing period to half compared to pharmaceutical method.\(^9\) Dr. L.J Walsh conducted study on the mechanism of action of LLLT and he concluded that LLLT reduces pain and accelerates wound healing by perhaps „stimulating oxidative phosphorylation in mitochondria and modulating inflammatory responses”\(^10\). It is best to treat aphthous ulcers within the first 48 hours. A 400 micron tip is used for small lesions or an LLLT(8mm) is used for larger lesions. The laser is started in a defocussed mode 5-8mm away from the lesion and advanced towards the periphery 2-3mm away. Continual movement from the periphery to the centre is done. A period of 15-20 seconds is given between the laser „passes” allowing the tissue to cool. The area is rubbed with a wet gloved finger to determine if there is reduced pain felt. Likewise a 2nd and 3rd pass need to be done to completely reduce the pain. After each pass, the area should be palpated to check for reduced pain. It is believed that this laser treated area is less likely to reappear with a new lesion, if treated 1-2 times.

Leukoplakia Verrucous Carcinoma is defined by WHO as „a white patch or plaque that cannot be characterized clinically or pathologically as any other disease”. Diffuse lesions cannot be managed by excision. In such lesions, carbon dioxide lasers can be used in a defocussed mode to produce cross hatched pattern. The disadvantage of vaporization is that, a specimen cannot be taken and sent for pathological examination, so, the histology of the lesion cannot be determined.\(^11,12\)

Lichen planus is a common dermatologic disease that often affects oral mucosa. It usually affects the middle aged adults. The skin lesions of lichen planus have been described as purple, pruritic papules. The oral lesions are exhibited in two forms: reticular and erosive. The reticular form is characterized by interlacing white lines called Wickham’s striae. The erosive form appears as erythematous area with central ulceration. Erosive lichen planus can be controlled by laser treatment. Carbon dioxide laser should be used along with selected local and systemic medications. This laser is set on a continuous, defocused mode and the usual cross hatched pattern is used. The contact Nd:YAG laser with round...
probe can also be used. This condition cannot be cured by laser treatment, it is used for palliative treatment. It has been reported from patients that there is a significant decrease in burning sensation from the lesion. Hong-Sai reported that there is an improvement in the histologic appearance after laser therapy.\[^{13}\]

**Recurrent Herpetic Simplex Lesions**\[^{19,20}\]. Alfonso et al looked at 232 patients using an AlGaAs diode laser in the prodromal stage, in the stage of vesicles, in the crust stage and in lesions infected secondarily. In addition the laser radiation was also applied on the vertebrae C2-C3 where the resident ganglion of the virus is located. It was found that 100% of the prodromal stages, 95% of the vesicular stages, 91% of the crust stages were able to cure within the first 48 hours. The patients with secondarily infected lesions needed more than 48 hours to cure, although not more than 5 days[21]. Schindl and Neumann did a study on LLLT for delaying the recurrence of the lesion outbreaks. It was found that the recurrence free interval in the laser treated group was 37.5 weeks and in the placebo group, it was 3 weeks \[^{14}\].

**Nicotina** appears as a collection of red dots surrounded by a halo of white keratin. These red dots are due to the ductal openings of the minor salivary glands in response to the inflammation. After finishing the process, the final lased surface layer is left undisturbed to act as barrier and help in the protection of the healing surface. A palatal splint is fabricated to help the patient protect the lased surfaces during eating and drinking. An Nd:YAG contact round surgical probe can also be used in a similar manner to the carbon dioxide laser.\[^{15}\]

**Oral Papillomatosis** is reactive tissue growth that usually develops due to ill-fitting dentures, poor denture hygiene or due to wearing the denture 24 hours a day. It usually occurs on the hard palate beneath the denture base. It is usually asymptomatic. The mucosa is erythematous and has a papillary surface. \[^{16}\]. Diffuse lesions can be managed by vaporization with CO2 laser after selective punch biopsies have been taken. The laser is set on continuous defocussed mode and using the cross hatching method, the area of the lesion is covered. The lased tissue surface is wiped off with saline soaked sponge. The contact Nd:YAG laser with a round probe can also be used to eliminate the lesion by stroking the surface in a similar cross hatched manner without lifting the tip of the probe from the surface of the lesion.

**Peripheral Ossifying Fibromas** occurs solely on the soft tissue overlying the alveolar process. It is a common gingival growth that usually arises from the interdental papilla. The etiopathogenesis of peripheral ossifying fibroma is unclear but trauma or local irritation due to dental plaque, calculus, ill-fitting dental appliances and poor-quality dental restorations can lead to the development. These lesions can be effectively treated with Er,Cr:YSGG. Iyer VH et al. reported that the outcome was painless experience to the patient, minimal intraoperative bleeding in the surgical field and excellent healing of the operated area in 1 week period (Iyer et al. 2012) \[^{17}\].

**Denture-induced fibrous hyperplasia** is a response of tissues to a chronically ill-fitting denture and present as a benign condition which frequently coexists with denture stomatitis. Kumar NJ et al. successfully treated the case of denture induced fibrous hyperplasia with the help of carbon dioxide laser and concluded that CO2 lasers could be an excellent alternative to conventional modalities (Kumar, Bhaskaran 2007) \[^{18}\].

**Mucoceles** are benign lesions of the oral cavity that develop due to extravasation or retention of mucous from salivary glands in the subepithelial tissue generally in response to trauma. Pedron IJ et al. on the basis of findings of their study concluded that laser treatment provides satisfactory results and allowed for a satisfactory histopathological examination of the excised tissue in case of mucocele (Pedron et al. 2010) \[^{19}\].

**Hemangiomas** are benign vascular proliferations consisting of numerous capillary structures usually present on the tongue, lips, mucous membrane and gingiva. Genovese WJ et al concluded that application of gallium arsenide (GaAs) high potency diode laser in the treatment of hemangioma reduced bleeding during surgery, with a consequent reduction in operating time and promoted rapid postoperative hemostasis (Genovese et al 2010)\[^{20}\].

**Lymphangioma** is often asymptomatic and is detected with the appearance of a slow growing painless cystic mass covered by healthy mucosa. Despite being a congenital benign lesion, lymphangioma may cause severe esthetic deformities, and surgical excision is the main treatment. Dos Santos Aciole GT et al reported that the use of CO2 laser was practical, easy to carry out and effective on the treatment of oral lymphangiomas,
with no lesion recurrence within the follow-up periods (dos Santos Aciole et al. 2010) 21.

Superpulsed low-level laser therapy (LLLT) seems to be a good choice as a non-invasive treatment for tempomandibular joint pain while exhibiting a low cost for the patient. Many authors have reported significant pain reduction with low-level laser therapy in acute and chronic musculoskeletal pain conditions (Ninomiya, Hosoya et al., 2007) 22. Hence the therapeutic effect of diode laser on TMJ can be conferred through its photodynamic effects, alteration in blood flow, and mechanisms for reducing the inflammatory response of body in TMJ against environmental factors. 23

**Applications In Periodontics**

Laser is a viable alternative to the scalpel for various soft tissue procedures such as frenectomy, gingivectomy and gingivoplasty, de-epithelization of reflected periodontal flaps, removal of granulation tissue and crown lengthening.

**a)** Gingivectomy: Pick RM et al presented a 12 cases of phenytoin hyperplasia removed surgically by the CO2 lasers and hence laser gingivectomy and suggested that in the future the laser may offer an alternative or an advancement to current procedures now used in dentistry (Pick et al. 1985) 24.

**b)** Crown Lengthening: Lasers have been promoted for clinical crown lengthening without gingival flap reflection for both esthetic and prosthetic reasons. The only existing supports for such applications are non-controlled case reports (Cobb 2006). 25

**c)** Frenectomy: Laser surgery may be considered a useful tool for the clinician in performing frenectomy. According to Kafas P et al. diode laser frenectomy may be performed without infiltrated anaesthesia with the optimum healing postsurgically (Kafas et al. 2009) 26.

**d)** Tissue Pigmentation Reduction: Recently, laser has been widely used and is even preferred over the scalpel technique procedures for depigmentation (Roshna & Nandakumar 2005). 27

**Applications In Conservative Dentistry And Endodontics**

Soft tissue lasers have been successfully used for the removal of coronal pulp and immediate pulp capping due its thermal and hemostatic effect. Lasers causes modification of the tubular structure of dentin by melting and fusing of the hard tissue or smear layer and subsequent sealing of dentinal tubules leading to reduction in sensitivity of teeth. Laser radiation has the ability to remove debris and smear layer from the root canals due to its potential to kill the microorganisms by its thermal effects. 3

**Applications In Orthodontics**

Lasers are widely used in Orthodontics for aesthetic gingival re-contouring, soft tissue crown lengthening, exposure of soft-tissue over the impacted teeth, removal of inflamed and hypertrophic tissue, frenectomy in case of highly attached frenum causing hindrance to tooth movement in diastema cases, tissue removal at the site for mini screw and Low Level Laser Therapy for reduction in pain experienced during the orthodontic therapy. 3

**Advantages (Naik 2010) 28**

- Dry surgical field and better visualization.
- Tissue surface sterilization and reduction in bacteremia.
- Decreased swelling, edema and scarring.
- Decreased pain.
- Faster healing response.
- Increased patient acceptance.
- Minimal mechanical trauma.
- Negotiates folds in tissues.

**Disadvantages (Mahajan 2011) 29**

- They are relatively high in cost.
- Operations of lasers require specialized training.
- Dental instruments mainly used are both side and end cutting thus; a modification of clinical technique is required.
- No single wavelength will optimally treat all dental disease.
- There is inability to remove metallic and cast-
porcelain defective restorations by erbium family lasers.

- Harmful to eyes and skin.

**Conclusion**

The application of lasers has been recognized as an adjunctive or alternative approach in soft tissue surgeries. Laser treatments have been shown to be superior to conventional mechanical approaches with regard to easy ablation, decontamination and hemostasis, as well as less surgical and postoperative pain in soft tissue management.

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**References**


A White Man Carrying Red Card-An Unusual Presentation of Oral Squamous Cell Carcinoma

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Abstract

Background: Oral mucosal lesions are common these days due to the exposure to limitless environmental insults. Most of the oral mucosal lesions are present in the buccal mucosa, tongue, palate, alveolar mucosa, floor of the mouth are benign, premalignant or malignant.

Case presentation: A 42 year old patient came with a chief complaint of whitish plaque in the right buccal mucosa which happened to occur due to parafunctional habit. But on further investigation it was proved to be well differentiated squamous cell carcinoma of right buccal mucosa. Conclusion:

Keywords – Squamous cell carcinoma, Premalignant lesion, leukoplakia

Introduction

Oral cavity is the mirror of our body. There are numerous lesions we see in our day to day life. These lesions can be white, red or mixed beginning from innocuous to malignancy. Most of the white lesions are seen in buccal mucosa, tongue, gingiva and alveolar mucosa.¹,² So a thorough history taking, physical examination and blood investigations should always be succeeded by biopsy of the white lesion to analyze the histopathological status.³ Studies have shown that every white lesion have a chance to change to malignancy. Therefore any white lesion in the oral cavity is to be suspected.

Case Report

A 42 year old male patient came to the department of Oral Medicine with a chief complaint of whitish patch in the right side of the mouth for past 3 months. Patient gave a history of wearing fixed partial denture for past 6 months and complains of cheek biting while chewing. There was no pain or burning sensation in the associated area. He had a habit of smoking beedi before 2 years. Patient’s medical and family history were non contributory.

On general examination patient had normal gait and posture and was well oriented, conscious and moderately built. No evidence of pallor, icterus, cyanosis and clubbing was present. A single right submandibular lymph node was palpable which was about 1 x 1cm in size approximately, oval in shape, firm, mobile and non-tender. Intra oral examination revealed a solitary well defined greyish white plaque present in right buccal mucosa which was approximately 2x1 cm in size and 1cm away from the right commissure along the occlusal plane. The surface of the lesion was rough. The margins were well defined. On palpation it was firm in consistency, non-tender, doesn’t bleed on palpation, indurated and fixed to underlying structures. FPD placed in relation to 17 to 27 in upper arch and 45 to 37 in the lower arch.
Correlating with the history and clinical finding provisional diagnosis was given as frictional keratosis and differential diagnosis as leukoplakia. Excisional biopsy was performed.

Histopathological features revealed severely dysplastic surface epithelium with underlying connective tissue stroma and malignant epithelial cells were seen invading the connective tissue in the form of islands. Well formed keratin pearls were also seen within the tumor islands. Suggestive of Well differentiated squamous cell carcinoma.

A CECT was performed and it showed Mild asymmetry and prominence of soft tissue in the anterolateral aspect of oral cavity on the right side. No definite enhancing lesion identified. Small submental and bilateral submandibular nodes was also seen.

Surgical excision of the lesion along with supra-omohyoid neck dissection was done. The patient was advised to report every 6 months for review.

Worldwide, it is estimated that there were approximately 274,300 new cases of and 127,500 deaths attributed to cancer of the oral cavity during 2002. India has world's highest number (nearly 20%) of oral cancers with an estimated 1% of the population having oral premalignant lesions. Most of the oral cancer are squamous cell carcinomas. Clinically they begin as white
hyperkeratotic patch mostly and microscopically, these lesions may exhibit oral epithelial dysplasia (OED), a histopathologic diagnosis characterized by cellular changes and maturational disturbances indicative of developing malignancy. Any white lesion in the oral cavity can be either benign, pre-malignant or malignant.

Lesions of chronic frictional keratosis from parafunctional habits (cheek biting or chewing) and benign alveolar ridge keratosis, common on the retromolar pad, all represent frictional keratosis and will also exhibit hyperkeratosis and acanthosis. As such, when a clinician receives a report of “hyperkeratosis, acanthosis, or epithelial hyperplasia,” without further comment, the lesion could represent an entirely benign lesion caused by friction or a true leukoplakia with the potential of developing dysplasia or invasive cancer. A study done by Simi in the 2012 revealed the 72% of white lesions occur in the right buccal mucosa. White patches may be isolated or involve multiple areas and have variable presentations including linear patterns, plaque like lesions, diffuse patches and mixed white and erythematous areas.

The dental professionals should be aware of mucosal lesions pattern and presentation to detect early diagnosis and management. The oral cavity is vulnerable to a limitless number of environmental insults because of its exposure to the external world. The use of tobacco products in our country has increased. Even after public education and awareness programs conducted people prefer these products. Tobacco always have a greater impact in oral lesions as it has many carcinogenic substances in it.

**Conclusion**

All white lesions need not be malignant but malignant lesions can be a white lesion. Every dentist should possess an eagle eye in tracing the oral mucosal lesions however small it is. It is important to investigate the lesion with a thorough history, examination and appropriate investigations. Oral medicine plays a major role in identification of the lesion and treatment planning.

**Ethical Clearance** – Not needed as it is case report

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**Conflict of Interest** – Nil

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11. MeenakshiBhasin, Ravinder S Saini ,SanjeevLaller,

Antibacterial Effectiveness of Cinnamon Chewing Gum on Streptococcus Mutans

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Abstract

Aim: The aim of the present study is to evaluate the effectiveness of Cinnamon (Big Red) and Regular (Juicy Fruit) chewing gum on Streptococcus mutans. Method: The present study was undertaken recruiting 60 students, of Sree Balaji Dental College and Hospital, aged 18-19 years. The subjects were divided into 2 groups [Group I- Cinnamon (Big Red) chewing gum (n=30) and Group II-Regular (Juicy fruit) chewing gum (n=30)]. Baseline (unstimulated) saliva samples were collected from all the selected subjects and they were instructed to chew one pellet of their respective chewing gums thrice daily for nine successive days. The unstimulated saliva samples were collected on the 10th day. Standard microbiological assay was performed to determine the salivary levels of Streptococcus mutans. Statistical analysis was performed using student’s t test (SPSS Version 18.0). Results: The results of the present study reveals that Cinnamon chewing gum is highly efficient in reducing the salivary levels of Streptococcus mutans compared to juicy fruit. Conclusion: The results obtained from the present study demonstrates the beneficial (antibacterial) effect of Cinnamon chewing gum compared to juicy fruit in reducing the salivary levels of Streptococcus mutans, a noted cariogenic bacteria.

Keywords: Cinnamon, Chewing gum, Streptococcus mutans

Introduction

Chewing is an important biological function that begins the process of ingestion and digestion, thereby affecting the entire body. The simple act of chewing helps to relieve anxiety and improves alertness and also helps in reducing stress levels.1 Chewing gum is defined as a "Solid preparation with a base consisting of gum which should be chewed and not swallowed, providing a slow and steady release of the medicine contained."2 Prehistoric men used to chew lumps of resin from mastic (mastiche), and/or sapodilla tree (chicle). Later the spruce tree resin was used, that got replaced by paraffin wax which became the new base for chewing gum. In 1869, Thomas Adams produced the first modern chewing gum using chicle. The modern day chewing gum contains synthetic resins for better quality, texture and taste.2 In the developing countries, drugs are not only expensive but also have many side effects during treatment for any disorders, that is why now in this era it is being emphasized to search medicinally valuable plants and predict their biological activity. Scientific evidence is accumulating and many of the plants have medicinal properties that alleviate symptoms or prevent diseases.3

Cinnamon has been a favorite spice around the world not only because of its health benefits but also because...
it flavors and preserves food. Cinnamon (Cinnamomum cassia) of the family Lauraceae is also known as Sweet wood and Gui Zhi. It contains medicinally important essential oil in leaves, fruits inner and outer bark. Much of cinnamon’s bioactivity resides in its oil, which is about 90% cinnamaldehyde. It is used mainly in medicine, foods and cosmetics, and also contains both anti-fungal and anti-bacterial properties that can be used to prevent food spoilage due to bacterial contamination. The active principles in the cinnamon spice are known to have anti-oxidant, anti-diabetic, anti-septic, local anesthetic, anti-inflammatory, rubefacient (warming and soothing), carminative and anti-flatulent properties.

The aim of the present study is to evaluate the effectiveness of Cinnamon (Big Red) and Regular (Juicy Fruit) chewing gum on *Streptococcus mutans*.

**Materials and Method**

This is a case controlled study in which the study group consisted of 60 subjects in the age group of 18-19 years irrespective of sex. The subjects volunteered to participate after verbal and written information. Ethical clearance was obtained from institutional ethical committee (SBDCEM104/12/12), Sree Balaji Dental College and Hospital, Chennai. Informed consent was obtained from all the subjects.

**Subject Selection Criteria**

Subjects aged 18-19 years.

Systemically healthy subjects.

No history of antibiotic therapy for the past 3 months.

No history of oral prophylaxis done 3 months prior to the study.

No fixed or removable orthodontic appliance or prosthesis.

Caries-free oral cavity.

Non-allergic to gum ingredients.

Absence of TMJ disorders.

The subject’s personal data including their name, age, sex and address and their past medical and dental history (general health, antibiotics taken previously and whether oral prophylaxis was done) was recorded on a proforma. The oral cavity of all the subjects was examined on the dental chair with a mouth mirror and probe by a single examiner. Pertaining to the subject selection criteria and after oral examination, 60 subjects were selected out of 80 subjects examined.

Oral prophylaxis was done using ultrasonic scaler for all the 60 subjects and the subjects were then instructed to abstain from oral hygiene measures for the next 24 hours. They were also instructed not to eat, drink or chew gum one hour prior to saliva collection on the first and the tenth day.

Subjects were randomly divided into two groups of 30 each:

- **Group I** - Cinnamon chewing gum (Big Red, Wrigley’s, USA)
- **Group II** - Regular chewing gum (Juicy Fruit, Wrigley’s, USA)

**Sample Collection**

The baseline saliva samples (unstimulated saliva) were collected in the microbiological laboratory by instructing the subjects to spit in a sterile disposable plastic container for 60 seconds. Ten microlitres of unstimulated saliva sample was measured using micropipette and inoculated into Mutans Sanguis Agar by spread plate method for determining the salivary levels of *Streptococcus mutans*. The subjects were then given Cinnamon (Big Red) and Regular (Juicy Fruit) chewing gum and instructed to chew one chewing gum for 20 minutes for nine successive days thrice daily (i.e., after breakfast, lunch and dinner).

The subjects were asked to return to the microbiological laboratory on the tenth day and the unstimulated saliva samples were collected by instructing the subjects to spit in a sterile disposable plastic container for 60 seconds. Ten microlitres of stimulated saliva sample was measured using micropipette and inoculated into Mutans Sanguis Agar by spread plate method for determining the salivary levels of *Streptococcus mutans*.

Ten microlitres of unstimulated saliva samples that was inoculated onto Mutans Sanguis Agar by spread plate method, was placed in the candle jar and incubated at 37°C for 24 hours. Based on the colony morphology (rough, heaped, irregular colonies resembling frosted glass) *Streptococcus mutans* group of colonies was
identified and colony forming units (cfu) were counted.

Results

The data obtained was statistically analysed using student’s t test (SPSS Version 18.0). P value < 0.05 was considered significant and the following results were obtained.

Table 1. Mean and standard deviation for Group I- Cinnamon (Big Red) chewing gum

<table>
<thead>
<tr>
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<th>Cinnamon (n=30)</th>
<th>Independent samples t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline-cfu/ml</td>
<td>63483.73</td>
<td>48812.29</td>
</tr>
<tr>
<td>10th day-cfu/ml</td>
<td>13436.90</td>
<td>34533.55</td>
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</table>

Table 2. Mean and standard deviation for Group II- Regular (Juicy Fruit) chewing gum

<table>
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<th>Independent samples t-test</th>
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</thead>
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<tr>
<td></td>
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<td>SD</td>
</tr>
<tr>
<td>Baseline-cfu/ml</td>
<td>40076.07</td>
<td>49764.22</td>
</tr>
<tr>
<td>10th day-cfu/ml</td>
<td>73384.93</td>
<td>44890.82</td>
</tr>
</tbody>
</table>

Discussion

Dental caries is a significant multifactorial disease and microorganisms along with diet plays a major role in its causation. *Streptococcus mutans* is reported to be the etiological agent for initiation of dental caries.6,7,8,9

Dr. William F. Semple, a dentist from Ohio, first patented chewing gum. Chewing gums not only serve as a tasty confectionary but possess several properties that are advantageous to the oral tissues.2 Chewing gums act as a salivary stimulant that increases the salivary flow, enhances the salivary remineralisation potential, and cleanses the mouth.

Aspirin containing chewing gum was the first medicated chewing gum introduced in the commercial market in 1928. In 1991, the Commission for European communities approved chewing gum as a term for pharmaceutical dosage. Medicated chewing gums serve as a vehicle for the slow and steady release of specific medicinal/therapeutic products such as antibiotics, nicotine, phosphates, fluorides, etc.2

Currently various studies have reported that short term usage of xylitol containing candies, snacks and chewing gums, induce a significant reduction in the levels of salivary *Streptococcus mutans*.10,11,12,13 Also, chlorhexidine chewing gums are reported to reduce oral *Mutans Streptococcus (MS)* load and also exhibits significant substantivity.

Plant products have long been used in the traditional medicine for the treatment of infectious diseases.14 A large variety of plant extracts have been reported to possess antibacterial activity against *Streptococcus mutans*. Cinnamon oil is reported to possess antibacterial activity against both gram positive and gram negative bacteria.15

Shan et al, (2007)16 has also reported that cinnamaldehyde is the major active constituent of cinnamon. The hexane extract of cinnamon (100 mg/ml) is reported to possess excellent antibacterial activity against *Streptococcus mutans* that corresponds to 100 µg/ml of the ampicillin concentration.17 Previous studies have reported that cinnamon has potent
antibacterial activity against *Streptococcus mutans*. Therefore, Cinnamon containing chewing gum [Big Red (Wrigley’s)] was selected for the study, and provided for Group I subjects to evaluate the role of cinnamon in reducing the oral *Streptococcus mutans* load.

A majority of the gums available in the market have added sweeteners that eventually increase the availability of dietary sucrose followed by low pH due to sugar metabolism. This in turn causes the highly mineralised tooth enamel to be vulnerable for decay. Also, there is an increase in the load of cariogenic bacteria such as *Lactobacilli* and *Streptococcus mutans* that survive in acidic pH. Therefore, Regular [Juicy Fruit (Wrigley’s)] chewing gum was provided for group II subjects for comparison.

The results of the present study shows a significant decrease in the mean bacterial load (cfu/ml) of *Streptococcus mutans* between the baseline value (0 day) and the 10th day in the saliva of Group I subjects-Big Red (cinnamon) chewing gum. Conversely, there was a significant increase in the mean *Streptococcus mutans* load (cfu/ml) between the baseline value (0 day) and the 10th day in the saliva of Group II subjects–Regular (Juicy fruit) chewing gum.

Both Big Red as well as Juicy fruit chewing gum contain sugar at a concentration of 2g per serving (i.e., 6g per day). However, in the present study, in spite of the presence of sweeteners at similar concentration, significant reduction of salivary *Streptococcus mutans* load was observed after chewing cinnamon gum thrice daily for a period of nine successive days. This signifies the role of cinnamon in reducing the salivary *Streptococcus mutans* levels and this could be attributed to the predominant active compound cinnamaldehyde as documented by other researchers.

Cinnamaldehyde causes inhibition of the proton motive force, respiratory chain, electron transfer and substrate oxidation, resulting in uncoupling of oxidative phosphorylation, inhibition of active transport, loss of pool metabolites, and disruption of synthesis of DNA, RNA, proteins, lipids, and polysaccharides. In addition, the hydrophobicity exhibited by this biocide is reported to enable them to partition into and disturb the lipid bilayer of the cell membrane, rendering them more permeable to protons. Extensive leakage from bacterial cells or the exit of critical molecules and ions ultimately leads to bacterial cell death.

Our results are in line with Filoche et al, (2005) who has reported that cinnamon oil alone and in combination with chlorhexidine digluconate are potent antibacterial agents against planktonic and biofilm cultures of *Streptococcus mutans*. Cinnamaldehyde is reported to act against the plasma membrane of bacteria similar in action to that of chlorhexidine. Fani et al, has reported the Minimum Inhibitory Concentration (MIC) of cinnamon oil against *Streptococcus mutans* to be 3.12%.

**Conclusion**

The results obtained from the present study demonstrates the beneficial (antibacterial) effect of Cinnamon chewing gum compared to juicy fruit in reducing the salivary levels of *Streptococcus mutans*, a noted cariogenic bacteria.

Cinnamon (Big Red) chewing gum showed a significant decrease in the *Streptococcus mutans* colony forming units. Regular (Juicy Fruit) chewing gum showed a significant increase in the *Streptococcus mutans* colony forming units.

Within the limitations of the study, it could be speculated that Cinnamon based chewing gum effectively reduces the salivary load of *Streptococcus mutans*.

**Source of Funding** – Nil

**Conflict of Interest** – Nil

**References**

4. Bown D. The Royal Horticultural Society


Morphological Pattern of Palatal Rugae among Adolescents

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Abstract

Palatal rugae have been considered relevant for human identification due to its stability, and is equivalent to the fingerprint, in that it is unique for each individual. It is known as Palatal rugoscopy or Palatascopy. In the fields of forensic odontology, palatal rugoscopy is still in infancy as till date as the study of palatal rugae has not been extensive. Although palatal rugae appear to possess the features of an ideal forensic identification parameter as uniqueness, postmortem resistance. Hence palatal rugae can be used in postmortem identification provided an antemortem record exists.

Aim: Study of Morphological pattern of palatal rugae among adolescents from Tamilnadu Dravidian population was performed.

Methodology: 100 subjects were selected from different geographical areas between 17-19 years with equal distribution from undergraduate students of Sree Balaji Dental College and Hospital, Chennai, India. Maxillary impressions were made using Alginate impression material. 100 casts were made with Type III dental stone using vibrator. Rugae patterns were highlighted with sharp graphite pencil using magnification loop. Results:

Total distribution of rugae shapes of the studied samples, showed a maximum distribution of Line pattern 436 (32.8%), followed by Sinuous 352 (26.3%), Point 184 (13.9%), Composed 152 (11.34%), Curve 125 (9.39%), Angle 77 (5.88%), Circle 6 (0.45%). The distribution of individual rugae patterns among Males and females demonstrated the uniqueness of rugae pattern in different individuals, thus it is an effective reliable source of Identification provided ante-mortem records are available.

Conclusion: This study clearly demonstrated the uniqueness of rugae pattern in different individuals, thus it is an effective reliable source of Identification provided ante-mortem records are available.

Keywords: Rugae, Palate, Rugoscopy, Maxilla

Introduction

“Identity” is a set of physical characteristics, functional or psychic, normal or pathological, that define an individual. Proper identification of the deceased is very important to claim certification of death and for personal, social and legal reasons. Forensic dentistry is a specialty in dentistry which occupies a primary niche within the total spectrum of methods applied to medico-
Nowadays deaths due to high-speed transportation accidents and acts of terrorism are on the rise and identification of these victims is a major goal of forensic science. Methods of identification commonly employed are visual identification, fingerprint, dental records comparison and DNA profiling. Although DNA profiling is accurate, it is expensive and time consuming for use in large populations. Visual identification and fingerprints are limited by postmortem changes associated with time, temperature and humidity but dental tissues have been shown to withstand these conditions.

Palatal rugae are protected from trauma and high temperatures by lips, cheek, tongue and buccal pad of fat, teeth and bone. Physiologically the palatal rugae aid in oral swallowing, taste perception, participate in speech, chewing process, suction in children and in medico-legal identification process. The key factors which make palatal rugae one of the investigative tools in forensics are its internal position, stability, perennity etc. Qualitative characteristics of palatal rugae such as shape, direction and unification remain stable throughout the life. Harrison Allen stated that palatal rugae can be considered as an alternative source for identification.

Studies have demonstrated that no two individuals rugae pattern are alike in their configuration and that characteristic rugae pattern of the palate does not change as a result of growth. Even between twins, the studies have indicated that the patterns are similar but not identical.

Variations in rugae shape are evident in different populations. Thomas and Kotze in 1983 indicated rugae pattern were unique to each ethnic group and can be successfully used as a medium for genetic research.

**Methodology**

The Study was conducted at Department of Paedodontics and Preventive Dentistry in Sree Balaji Dental College & Hospital, Chennai, Tamilnadu, after obtaining approval from Institutional Ethical Committee (No.SBDCECM104/13/04). The sample consisted of 180 undergraduate students enrolled from 1st and 2nd year BDS. The subjects were informed about the nature of the study and for selection Convenience Sampling Technique was used. All participants who agreed to participate were distributed with a proforma which provided data like Age, Sex, Date of Birth, Native place, History of Orthodontic treatment, Orthognathic surgeries, Congenital anomalies, Palatal surgeries etc..

**A. Selection Criteria:**

100 subjects (Males-50 and Females-50) who fulfilled following Inclusion criteria;

- Age: 17-19 years.
- Same geographical area (Tamilnadu Dravidian population).
- No history of orthodontic treatment.
- No history of previous orthognathic, palatal surgeries.
- No congenital anomalies / malformations, were selected and an written informed consent was obtained. All these data collection were done by the principal investigator and numbered from 1-100.

**B. Methodology**

**Collection of Palatal prints :**

The participant was made to sit upright on the dental chair and appropriate perforated metal tray (ETN, Germany) was selected for the maxillary arch. The Alginate impression material (Neocolloid, Zhermack, Italy) was mixed as per the manufacturer’s instructions and loaded in the selected tray. A little amount of alginate was placed firmly against the rugae in the palate after thorough drying with cotton. The impression is washed under tap water to remove any debris and disinfected by immersing in sodium hypochlorite (1% NaOCl) (Prime Dental, Prime Dental Laboratories Private Ltd, Delhi) for half-an-hour. The impressions were then allowed to dry naturally. Type III dental stone (Denstone, Mumbai) was mixed as per the manufacturer instructions and poured with the use of vibrator to avoid air bubble formation. All the cast were made free of air bubbles and voids especially at the anterior third of the palate. Thus maxillary study models were obtained and numbered (1-100) accordingly on which to place the Calccorrugoscopy for interpretation.

**C. Method of Identification**

The elevations on the cast were highlighted by a sharp graphite pencil (2 HB) (Fig.3) under adequate
light and magnification loop (2.5x Keeler, Britain) (Fig.1.2) by the principal investigator. The highlighted rugae were interpreted on the study cast by the principal and co-investigator according to Trobo’s classification\(^7\) (Fig.2) as,

![Figure 1. Highlighted rugae on the cast](image1.jpg)

The Data was recorded in separate data sheets by principal and co-investigator and were subjected to statistical analysis using Independent samples t-test to assess:

![Figure 2. Trobo’s classification of palatal rugae](image2.jpg)

A: Point  
B: Line  
C: Curve  
D: Angle  
E: Sinous  
F: Circle  
X: Composed (Polymorphic)

### Results

This study was undertaken to evaluate the shape of palatal rugae distributed among Dravidian adolescents in Tamilnadu population and to determine the predominance of rugae pattern among Genders.

Males 50, Females 50. Total distribution of rugae pattern on maxillary casts in 100 subjects were tabulated in Table 1. It showed a maximum distribution of Line pattern 436 (32.8%), followed by Sinuous 352(26.3%), Point 184(13.9%), Composed 152(11.34%), Curve 125(9.39%), Angle 77(5.88%), Circle 6 (0.45%).

Distribution of individual rugae pattern among males is tabulated in Table 2, where the number of individual rugae pattern is shown with minimum of 0 and maximum of 9. The Total number of rugae pattern among 50 samples shows, 88 Point, 209 Line, 55 Curve, 42 Angle, 181 Sinuous, 3 Circle. There were 88 Point, 209 Line, 55 Curve, 42 Angle, 181 Sinuous, 3 Circle in the 50 studied samples. Our study also aimed at analyzing individual rugae pattern among 50 males which specifies 9 Line rugae pattern in1 individual, 7 Sinuous pattern in 1 individual, 7 Point in 1 individual, 5 Curve in 1 individual, 4 Angle in 1 individual,1 line in 1 individual,1 sinuous in 1 individual. None of the males had similar pattern of rugae distribution.

Distribution of individual rugae pattern among females is tabulated in Table 3, where the number of individual rugae pattern is shown with minimum of 0 and maximum of 11. The total number of rugae pattern among 50 samples shows, 96 Point, 227 Line, 70 Curve, 35 Angle, 171 Sinuous, 3 Circle. There were 96 Point, Line 227, 70 Curve, 35 Angle, 171 Sinuous, 3 Circle in the studied 50 samples. It was noted with 11 Line pattern in 1 individual, 8 Sinuous in 1 individual, 3 Angle in 1 individual, 6 Sinuous in 1 individual. None of the patterns were identical in each individual.

Table 4 shows, the comparison of rugae patterns between males and females. Statistical analysis was performed using Independent samples T test (SPSS version 18.0) which showed that the values are not statistically significant (P<0.005).
Comparison of rugae patterns between two examiners is tabulated in Table 5. Statistical analysis was performed using Independent samples T-test, which showed that values of Examiner 1 and Examiner 2 are not statistically significant.

Table 1. Total Distribution of Rugae patterns in 100 Subjects (N)

<table>
<thead>
<tr>
<th>Rugae pattern</th>
<th>Males</th>
<th>Females</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point</td>
<td>88</td>
<td>96</td>
<td>184 (13.9)</td>
</tr>
<tr>
<td>Line</td>
<td>209</td>
<td>227</td>
<td>436 (32.8)</td>
</tr>
<tr>
<td>Curve</td>
<td>55</td>
<td>70</td>
<td>125 (9.39)</td>
</tr>
<tr>
<td>Angle</td>
<td>42</td>
<td>35</td>
<td>77 (5.88)</td>
</tr>
<tr>
<td>Sinuous</td>
<td>181</td>
<td>171</td>
<td>352 (26.30)</td>
</tr>
<tr>
<td>Circle</td>
<td>3</td>
<td>3</td>
<td>6 (0.45)</td>
</tr>
<tr>
<td>Composed</td>
<td>77</td>
<td>75</td>
<td>152 (11.34)</td>
</tr>
<tr>
<td>Total</td>
<td>655</td>
<td>677</td>
<td>1332 (100)</td>
</tr>
</tbody>
</table>

n – Total no of rugae patterns

N – Total no of Subjects

Table 2. Total distribution of individual Rugae Pattern among Males

<table>
<thead>
<tr>
<th>No. of rugae pattern (n)</th>
<th>Point</th>
<th>Line</th>
<th>Curve</th>
<th>Angle</th>
<th>Sinuous</th>
<th>Circle</th>
<th>Composed</th>
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<tr>
<td></td>
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<tr>
<td>Total</td>
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<td>88</td>
<td>50</td>
<td>209</td>
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</table>
n= no.of rugae patterns
N= No.of Samples (50)
T= Total no.of rugae patterns, T= No.of Samples x No of Rugae Pattern (N x n)

Table 3. Total distribution of individual rugae pattern among Females

<table>
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<tr>
<th>No.of rugae pattern (n)</th>
<th>Point</th>
<th>Line</th>
<th>Curve</th>
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<td>1</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
<td>96</td>
<td>50</td>
<td>227</td>
<td>50</td>
<td>70</td>
<td>50</td>
</tr>
</tbody>
</table>

n= no.of rugae patterns
N= No.of Samples (50)
T= Total no.of rugae patterns, T= No.of Samples x No of Rugae Pattern (N x n)

Table 4. Comparison of rugae patterns in 50 Males & 50 Females

<table>
<thead>
<tr>
<th>Rugae Pattern</th>
<th>Gender</th>
<th>Sum (%)</th>
<th>Mean</th>
<th>S.D</th>
<th>(T-TEST)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point</td>
<td>M</td>
<td>88 (6.64)</td>
<td>1.75</td>
<td>1.87</td>
<td>0.627(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>96 (7.26)</td>
<td>1.92</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td>M</td>
<td>209 (15.65)</td>
<td>4.14</td>
<td>1.93</td>
<td>0.331(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>227 (17.16)</td>
<td>4.53</td>
<td>2.06</td>
<td></td>
</tr>
<tr>
<td>Curve</td>
<td>M</td>
<td>55 (4.08)</td>
<td>1.08</td>
<td>1.11</td>
<td>0.217(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>70 (5.29)</td>
<td>1.40</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td>Angle</td>
<td>M</td>
<td>42 (3.17)</td>
<td>.84</td>
<td>.91</td>
<td>0.420(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>35 (2.65)</td>
<td>.70</td>
<td>.81</td>
<td></td>
</tr>
<tr>
<td>Sinuous</td>
<td>M</td>
<td>181 (13.45)</td>
<td>3.56</td>
<td>1.69</td>
<td>0.611(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>171 (12.85)</td>
<td>3.39</td>
<td>1.64</td>
<td></td>
</tr>
<tr>
<td>Circle</td>
<td>M</td>
<td>3 (0.23)</td>
<td>.06</td>
<td>.24</td>
<td>1.000(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>3 (0.23)</td>
<td>.06</td>
<td>.24</td>
<td></td>
</tr>
<tr>
<td>Compound</td>
<td>M</td>
<td>77 (5.74)</td>
<td>1.51</td>
<td>1.02</td>
<td>0.886(NS)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>75 (5.59)</td>
<td>1.48</td>
<td>1.07</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

Palatal rugae develop as localized regions of epithelial proliferation and thickening in the hard palate. According to English et al. (1988) the characteristic rugae pattern did not change as a result of growth, remaining stable from the time of development until oral mucosa degenerate after death.9

Limson et al. (2004) and Filho et al. (2009) used photographs taken by digital cameras, transferred to the hard disk of computer and later analysed these images using a software programme.10,8 According to Pueyo et al. (1994),15 analysis of maxillary cast is the most commonly used techniques as it is simple, cost effective and more reliable. Hence in our study dental casts were used to record the palatal rugae details.

The most common shape observed in the present study was straight forms accounting for more than (32%) followed by sinuous (26%) compared to other forms (Trobo’s classification). This finding is consistent with the study by Sreenivasan Madankumar et al. (2013) who reported that, straight forms were more prevalent followed by other forms in a group of Chennai population (Thomas and Kotze classification).16 Nayak et al. (2007) categorised South Indians from Western Indians and inferred that straight forms to be higher and statistically significant in South Indians and Curved forms in Western Indians (Kapali et al classification).17 Moreover circular form were least in number among the studied Tamilnadu dravidian population. Our findings were in accordance to Shankar Shanmugam et al. (2012) where straight forms of rugae was also found to higher among South Indian population and circular forms were found to be very few in number in their study.18 Both line and straight are almost the same shape, but termed due to different classifications. Carlos Santos et al. (2011) reported straight rugae type to be predominant followed by sinuous in Portuguese population,19 Dennis E.O. Eboh (2012) reported that Line pattern (27.2%) to be predominant followed by sinuous (21.1%) in Urhobos of South-Southern Nigerian population.20 Abdellataif et al. (2011) found circular shape to be rare or even absent in one group of Saudi population.21 Thomas and Kotze studied the rugae patterns of 6 South African population to analyse interracial difference. Their results indicate that rugae were unique to each ethnic group and can be successfully used as a medium for genetic research.

Our results were similar to Dennis Eboh et al. (2012) reported with more number of rugae in female Urhobos (Southern Nigerians) when compared to males but it was not statistically significant.20 The present study also agrees with Kashima et al. (1990) who compared the palatal rugae shape of Japanese and Indian children and found there was no significant difference between male and female in either group.22 Some authors suggest the presence of sexual dimorphism in the biometric feature of palatal rugae. Fahmi et al. (2001) studied the rugae patterns in Saudi males and females and showed results with significant difference.23

Table 5. Comparison of Rugae patterns between Two Examiners

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Examiner 1</th>
<th>Examiner 2</th>
<th>T-test*</th>
<th>Sig**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>t-Value</td>
<td></td>
</tr>
<tr>
<td>Point</td>
<td>1.83 ± 1.73</td>
<td>1.85 ± 1.74</td>
<td>0.082</td>
<td>0.935</td>
</tr>
<tr>
<td>Line</td>
<td>4.30 ± 2.02</td>
<td>4.37 ± 1.99</td>
<td>-0.247</td>
<td>0.805</td>
</tr>
<tr>
<td>Curve</td>
<td>1.29 ± 1.28</td>
<td>1.27 ± 1.28</td>
<td>0.111</td>
<td>0.912</td>
</tr>
<tr>
<td>Angle</td>
<td>0.77 ± 0.86</td>
<td>0.85 ± 0.96</td>
<td>-0.621</td>
<td>0.536</td>
</tr>
<tr>
<td>Sinuous</td>
<td>3.49 ± 1.68</td>
<td>3.46 ± 1.66</td>
<td>0.129</td>
<td>0.877</td>
</tr>
<tr>
<td>Circle</td>
<td>0.06 ± 0.24</td>
<td>0.06 ± 0.24</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Composed</td>
<td>1.50 ± 1.04</td>
<td>1.49 ± 1.05</td>
<td>0.068</td>
<td>0.946</td>
</tr>
</tbody>
</table>
Conclusion

The following conclusion can be drawn based upon the present study,

Line was the predominant shape of palatal rugae seen among the studied adolescent group of Tamilnadu Dravidian population.

Comparison of rugae patterns between males and females showed no statistical significant difference, thus there was no sexual dimorphism in the rugae pattern.

This study clearly demonstrated the uniqueness of rugae pattern in different individuals, thus it is an effective reliable source of identification provided ante-mortem records are available.

Ethical Clearance – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/TN/2015)

Source of Funding – Nil

Conflict of Interest – Nil

References


Prevalence of Dental Caries in 6-14 Years Aged Schoolchildren Among Fishermen Community, Pulicat, Tiruvallur District, Tamil Nadu Using International Caries Detection and Assessment System (ICDAS II)

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Abstract

Background: DMF index has got proven limitations and hence new system was introduced. Hence, there is a need to collect contemporary data in accordance with the new system.

Aims: Aim of the present study was to assess the prevalence of dental caries among schoolchildren in fishermen community using the International Caries Detection and Assessment System (ICDAS II) criteria.

Methodology: The total number of school children who participated in this study was 541 aged between 6 - 14 years. Caries prevalence was assessed using ICDAS-II code by the chief researcher. The results were tabulated and subjected to statistical analysis and Binomial test was used to compare different groups.

Results: The overall prevalence of dental caries among the schoolchildren was 82.3%. with no significant difference between the genders. Non-cavitated (or) early enamel caries lesions was highly prevalent among the student population, among the teeth assessed CARS (Caries Associated with Sealants and Restorations) criteria showed that only 1.1% of the surveyed population had secondary caries.

Conclusion: It is recommended that continuous monitoring and effective implementation of preventive and restorative programs to be carried out in schools to increase the dental disease awareness thereby reducing the caries prevalence.

Keywords: Caries, ICDAS II, CARS

Introduction

Dental caries has historically been considered the most important global oral health burden and is still a major health problem globally as it affects 60-90% of school-age children and the vast majority of adults. Dental caries experience in children was relatively high in America (DMFT=3.0), Europe (DMFT=2.6), while the index was lower in most African countries (DMFT=1.7). In India, the prevalence of dental caries was 55.5% in 1940 and it rose to 68% in the 1960s. According to National Health Survey (2004), the prevalence of dental caries was reported to be 51.9% in 5 year old children, 53.8% in 12 year old children and 63.1% in 15 years-old teenagers.

In Tamil Nadu according to various studies done in 12 year old children, the point prevalence of dental caries...
was reported to be 61.2% (Gopinath VK et al., 1999) and 80% (Kumar PM et al., 2005). These extensive studies were done using DMFT index. However, there are severe various limitations to DMF index. Taking this into consideration, an index that is able to record these lesions to plan primary preventive measures would be ideal, as accepted by the Dental Caries Consensus Development conference 2001 and International Consensus Workshop on caries clinical trials held in Scotland, 2002. To overcome the limitations, International Caries Detection and Assessment System (ICDAS) was proposed. Jablonski-Momeni A et al. in 2008 stated that ICDAS -II has good reproducibility and accuracy for the detection of occlusal carious lesions at different stages of the disease. The validity and reproducibility of ICDAS have already been tested in many in-vitro and clinical studies. Large epidemiological studies have been conducted using ICDAS hence ICDAS has been internationally recommended for dental health surveys.

Though there are many studies in the literature involving prevalence of caries in different population, there are no studies related to fishermen’s community, implementing the new classification of caries detection. So, this study was planned to assess the prevalence of dental caries in school children using ICDAS -II criteria in fishermen community in Pulicat, Tiruvallur district, Tamil Nadu.

Materials and Method

This was a cross-sectional study carried out among children aged 6 – 14 years of fishermen community. Pulicat is a well-known seashore village in Tiruvallur district with predominantly fishing being the occupation of male population residing there. The list of recognized schools in the Pulicat village was obtained from the Tiruvallur district administrative office by the researcher. A consent form and self-administered questionnaire to participate in the study were given to the students to be duly filled by the parents/school teachers prior to the researcher visit to the school. The subjects whose parents are fishermen were included in the study. Students who were absent on the day of examination and students who were migrants to that area were excluded from the study.

After the inclusion and exclusion criteria were applied, 541 children were evaluated. Data collection was done, and Dental examination of the subjects was performed in the schools. During the regular school hours, under adequate natural light based on WHO guidelines (WHO 1997 Oral Health Survey). Socio-demographic details were obtained that included their name, age, sex, class, religion, parents occupation, oral hygiene practice and teeth identification (FDI System). After obtaining the details, the children were instructed to brush their teeth with tooth brush and tooth paste provided by the researcher and Dental examination for CARS detection criteria were used on the teeth affected by secondary caries.

The data obtained was analyzed using SPSS Version 21, using Binomial test was used to compare different groups: Gender, Age -wise prevalence, ICDAS codes, CARS Detection. P value <.05 was considered significant.

Results and Discussion

Dental caries is a common dental disease occurring during childhood, and it continues to be a major public health problem. Dental caries is a multi-factorial, microbial, infectious, transmissible disease of hard tissues of teeth characterized by the demineralization of inorganic structures and subsequent breakdown of organic moieties along with remineralization of the demineralized structures until there is cavitation. The World Health Organization (W.H.O) in 2003 has ranked dental caries as number three among all chronic non-communicable diseases that require worldwide attention for prevention and treatment. A World Health Organization (WHO) estimation of global DMFT for year-old children was about 200,335,280 among 188 countries included in their database.

In recent years, there is an increase in prevalence of dental caries in developing countries, which may be due to the increasing consumption of sugars and inadequate exposure to fluorides. In India, the prevalence of dental caries was 55.5% in 1940, and it rose to 68% in the 1960s. According to National Health Survey (2004), the prevalence of dental caries was reported to be 51.9% in 5 year old children, 53.8% in 12 year - old children. In Tamil Nadu, according to studies done by Gopinath VK et al. 1999 and Kumar PM et al. in 2005 in 12 year old children the point prevalence of dental caries was reported to be 61.2% and 80% respectively.

One of the factors to be considered when planning for the enhancement of dental care facilities in a particular
population is to know the prevalence of dental diseases and their treatment need of that population. Literatures show numerous studies on different population and community schoolchildren but data on fishermen population is sparse. Hence, this study was planned to assess the prevalence rate of dental caries among 6 - 14 year old fishermen community schoolchildren at Pulicat village, Tiruvallur district, Tamil Nadu.

Table I shows the distribution of samples from the 7 schools participated in this study. The total sample comprised of 258 – males and 283-females in the age of 6 -14 years. Traditionally, caries has been measured by WHO criteria using DMFT/S index, where only teeth or surfaces with cavitated lesions extending into the dentine have been counted. In recent decades, several caries assessment criteria have been developed to identify the presence of this pathology. A review of 29 systems of tooth decay investigation criteria concluded that most of them are ambiguous and does not identify the different stages of the disease process. ICDAS (International Caries Detection and Assessment System) is the globally recommended method to assess prevalence of dental caries. This method estimates the early enamel lesions and helps in planning the early treatment and also helps in monitoring caries pattern at the population level. It allows assessing the tooth decay activity and compare data from distinct sites and in different periods.

Table II shows the prevalence of dental caries recorded in the fishermen community school children in selected sample population. Among the 541 children, 445 children were affected with dental caries, with the prevalence rate of 82.3%. This suggests that fishermen community schoolchildren have higher prevalence of dental caries. This could be due to the lack of preventive and restorative dental care facilities as well as awareness among population in this region. Similarly, Grewal H et al. in 2011 (Delhi) and Shingare P et al. in 2012 (Maharashtra) also have reported caries prevalence of about 80% and 81% respectively for schoolchildren between the age group of 6 -14 years. But this was assessed using DMFT/deft index in which the early enamel lesions have not been included, whereas in our study we used I CDAS-II criteria which included early enamel lesion. By comparing our result with the above studies dental caries prevalence was found to be relatively higher in these studies. This can be due to the different dietary patterns and different types of food available in the urban region. Since, literature does not have any studies in the fishermen community on prevalence of dental caries our study result cannot be compared.

Table III represents the distribution of caries code in the study population which was assessed and analyzed according to ICDAS II. In the sample of 541 subjects, 12,944 teeth were assessed and coded by ICDAS -II criteria. Among the teeth assessed 10,877 were coded 0, which is about 84.10%, While 2,067 (15.90%) teeth were coded 1 to 6 with values of 3.23% for code 1, 6.01% for code 2, 3.43% for code 3, 1.20% for code 4, 0.84% for code 5, 1.19% for code 6. Out of 15.90% teeth coded with a score of 1 to 6, 9.24% subjects were presented with early enamel lesion i.e., code 1 (First visual change in enamel: opacity or discoloration is visible at the entrance to the pit or fissure after prolonged air drying, which is not or hardly seen on wet surface) and code 2 (Distinct visual change in enamel, when wet there is a curious opacity white spot lesion and/or brown discoloration which is wider than the natural fissure/pit). These codes represent the non-cavitated/early lesions in the enamel as per the ICDAS criteria which would not be accounted if assessed using DMFT index. This draws attention towards providing preventive treatment modalities so as to control the progression of dental caries to this study group.

Table IV represents the distribution of dental caries among gender in the fishermen community of our study population. There were 258 males and 283 females. The prevalence was 82.3% in females (233 subjects) and 81.2% in males (212 subjects). In our study, females had a slightly higher prevalence of caries (1.1%) than males, which was not statistically significant. The same was observed in studies conducted by Kumar PM et al. 2005 (Chennai) and Grewal H et al. 2011(Nainital) where higher caries prevalence was present in females than males with the following percentage differences of 7.1% and 4.16% respectively in the age group between 6 -14 years. Most of the Indian studies show more caries prevalence in females than males which could be attributed to the negative attitude of parents towards oral care for females. Study done by Lukacs JR et al. in 2006 in Canary Island has also reported that caries rate was higher in females than males which may be due to earlier eruption of teeth in girls, hence longer exposure of girl’s teeth to the cariogenic oral environment. In contrary, Ismail et al. 2008 reported boys being more affected than girls, and this
variation could be attributed to the different age group and geographic locations of that study. Table V shows the age-wise prevalence of dental caries in 6-14 year old children. Caries prevalence was 81.9% and 81.6% in 6 and 7 years of age respectively, there was a slight decrease in 8 years old children to 80.5% which may be due to the loss of carious primary incisors. On the other hand, among 9 years old children prevalence rate was increased to 86.4% which could be due to the early carious lesion in the first permanent molar and among 11 years caries rate decreased to 62.5%, which may be due to increase in the level of manual dexterity of the child improving their oral hygiene and loss of carious primary molars. Caries prevalence increased to 75.0% and 83.3% among 12 and 14 years old children which may be due to early lesion present in the newly erupted premolars and second molars. Studies reported by Dash JK et al. in 2002, Goyal A et al. in 2007 and Dhar V et al. in 2007 suggested that, increase in caries prevalence with advancing age appears till 9 years could be due to an increased exposure of the susceptible tooth to existing poor oral hygiene conditions. Shingare P et al. in 2012 suggested that reason behind the decreased prevalence at the age of 11-14 years could be due to increase in the level of manual dexterity of the child, increased awareness about oral health and also the process of post eruptive maturation, which makes tooth more resistant to caries as compared to immature tooth.

Table VI shows CARS (Caries Associated with Restoration and Sealants) detection criteria on the teeth with secondary caries. There were only 6 children (1.1%) had secondary caries on teeth. The results presented here, corroborate with other dental caries prevalence reports, which indicates that this disease continues to be very frequent and is globalised in this age group.

Table 1: Distribution of Samples According to Schools

<table>
<thead>
<tr>
<th>S. NO</th>
<th>SCHOOL NAME</th>
<th>NO. OF SUBJECTS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MALES</td>
<td>FEMALES</td>
</tr>
<tr>
<td>1.</td>
<td>PUMS, ARANGANKUPPAM</td>
<td>66</td>
<td>68</td>
</tr>
<tr>
<td>2.</td>
<td>PUMS, GUNANKUPPAM</td>
<td>40</td>
<td>58</td>
</tr>
<tr>
<td>3.</td>
<td>PUMS, LIGHT HOUSE</td>
<td>63</td>
<td>46</td>
</tr>
<tr>
<td>4.</td>
<td>PUPS, GUNANKUPPAM</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>5.</td>
<td>PUPS, SAMBASAPALLIKUPPAM</td>
<td>30</td>
<td>41</td>
</tr>
<tr>
<td>6.</td>
<td>PUPS, THIRUMALAI NAGAR</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>7.</td>
<td>PUPS, VAIRAVANKUPPAM</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>258</td>
<td>283</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(47.7%)</td>
<td>(52.3%)</td>
</tr>
</tbody>
</table>
Table 2: Prevalence of Dental Caries in the Study Population

<table>
<thead>
<tr>
<th>CARIES STATUS</th>
<th>COUNT</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENT</td>
<td>445</td>
<td>82.3</td>
</tr>
<tr>
<td>ABSENT</td>
<td>96</td>
<td>17.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>541</td>
<td>100</td>
</tr>
</tbody>
</table>

**BINOMIAL TEST**  
Test Prop.: 0.50  
Sig.: 0.000

Table 3: Distribution of Caries Pattern as Per ICDAS Codes:

<table>
<thead>
<tr>
<th>CODES</th>
<th>NO. OF TEETH PRESENT</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODE 0</td>
<td>10877</td>
<td>84.10%</td>
</tr>
<tr>
<td>CODE 1</td>
<td>419</td>
<td>3.23%</td>
</tr>
<tr>
<td>CODE 2</td>
<td>779</td>
<td>6.01%</td>
</tr>
<tr>
<td>CODE 3</td>
<td>444</td>
<td>3.43%</td>
</tr>
<tr>
<td>CODE 4</td>
<td>158</td>
<td>1.20%</td>
</tr>
<tr>
<td>CODE 5</td>
<td>110</td>
<td>0.84%</td>
</tr>
<tr>
<td>CODE 6</td>
<td>157</td>
<td>1.19%</td>
</tr>
</tbody>
</table>

Table 4: Prevalence of Dental Caries According to Gender

<table>
<thead>
<tr>
<th>SEX</th>
<th>CARIES STATUS</th>
<th>PRESENT</th>
<th>ABSENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COUNT</td>
<td>%</td>
<td>COUNT</td>
</tr>
<tr>
<td>MALE</td>
<td>212</td>
<td>81.2</td>
<td>46</td>
</tr>
<tr>
<td>FEMALE</td>
<td>233</td>
<td>82.3</td>
<td>50</td>
</tr>
</tbody>
</table>

Binomial Test  
Sig.: 0.343  
Sig.: 0.760

Table 5: Distribution of Caries Pattern by Age

<table>
<thead>
<tr>
<th>AGE</th>
<th>CARIES STATUS</th>
<th>BINOMIAL TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRESENT</td>
<td>ABSENT</td>
</tr>
<tr>
<td></td>
<td>COUNT</td>
<td>%</td>
</tr>
<tr>
<td>6</td>
<td>122</td>
<td>81.9</td>
</tr>
<tr>
<td>7</td>
<td>62</td>
<td>81.6</td>
</tr>
<tr>
<td>8</td>
<td>91</td>
<td>80.5</td>
</tr>
<tr>
<td>9</td>
<td>95</td>
<td>86.4</td>
</tr>
<tr>
<td>10</td>
<td>58</td>
<td>84.1</td>
</tr>
</tbody>
</table>
Table 6: Distribution of Secondary Caries by ICDAS (CARS Criteria)

<table>
<thead>
<tr>
<th>CARS Criteria</th>
<th>COUNT</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSENT</td>
<td>535</td>
<td>98.9</td>
</tr>
<tr>
<td>PRESENT</td>
<td>6</td>
<td>1.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>541</td>
<td>100</td>
</tr>
</tbody>
</table>

**Conclusion**

The overall prevalence of dental caries among the schoolchildren was 82.3%. Non-cavitated (or) early enamel caries lesions were highly prevalent among the student population, among the teeth assessed CARS (Caries Associated with Sealants and Restorations) criteria showed that only 1.1% of the surveyed population had secondary caries. It is recommended that continuous monitoring and effective implementation of preventive and restorative programs to be carried out in schools to increase the dental disease awareness thereby reducing the caries prevalence.

**Ethical Clearance** – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/TN/2015)

**Source of Funding** – Nil

**Conflict of Interest** – Nil

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Management of Atrophic Maxilla – A Review

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Abstract

The placement of implants in the alveolar bone remains a challenge because of the resorption of the residual ridge resulting in insufficient bone volume in one or more dimensions. A severely atrophied maxilla presents serious limitations for conventional implant placement. This presents challenge to the surgeon for implant placement in harmony with the planned prosthesis. Important aspects that need to be considered for implant placement in posterior atrophic maxilla are discussed in this article and both surgical and non-surgical options are suggested.

Key Words: Atrophic maxilla, buttresses, implants, maxillary sinus, osteotomy, bone graft, sinus lift, zygoma implant, pterygoid implant, tilted implant, mini-implant.

Introduction

The reconstruction of edentulous, atrophic jaws according to functional and esthetic factors not only restores chewing function, but leads to positive psychosocial effects and thus also improves the patient’s quality of life.22 The rehabilitation of edentulous jaws with osseointegrated implants has been proven to be a predictable treatment over the time. A sufficient and long-term stable bone site is the basis of successful implant therapy. Implant rehabilitation has shown higher success rates of 84–92 %, when sufficient bone is available in maxilla. But, atrophy in maxilla is not an uncommon finding and conventional implant placement gets complicated in such situations.1

However, due to atrophy or periodontal disease, local conditions of edentulous ridges may be unfavorable for implant placement. In maxilla, centripetal pattern of alveolar resorption, pneumatization of maxillary sinuses, presence of nasal fossae and nasopalatal duct, poor bone quality complicate implant placement.28 In particular, severe atrophy of the edentulous maxilla (class VI according to Cawood and Howell 1988 classification), may result in insufficient bone volume and unfavourable vertical, transverse, and sagittal interarch relationship, due to the tridimensional resorption pattern of long-standing maxillary edentulism. Finally, maxillary sinus pneumatization may further reduce the available bone for a safe and reliable implant-supported dental rehabilitation. This may render implant placement impossible or incorrect from a functional and esthetic viewpoint.2

Several surgical procedures have been developed to increase local bone volume in deficient anatomical regions. These techniques pose a series of inconveniences, such as the need for multiple surgical interventions, the use of extraoral bone donor sites (e.g., iliac crest or skull) - with the morbidity involved in surgery of these zones - and the long duration during which patients remain without rehabilitation during the graft consolidation and healing interval. These factors complicate patient acceptance of the restorative treatment and limit the number of procedures carried out.3

In order to overcome such limitations, different therapeutic alternatives have been proposed, such as, short implants, or implants placed in specific anatomical areas like the pterygoid region, the tuber or the zygoma. Any of these procedures requires considerable surgical
expertise and has its own advantages, limits, surgical risks and complications involving biological and financial costs.¹

Sinus floor elevation

The sinus lift operation has been used since the early 1980s to gain vertical bone height in atrophic regions of the posterior maxilla, prior to the placement of dental implants (Boyne and James 1980).² Two techniques used are: The classical approach through a lateral window and for less severe bone loss, the osteotome technique (Summers Sinus floor elevation). The lateral window osteotomy is the most commonly used and reported technique for sinus augmentation, in which a fenestration is made through the buccal bone, the Schneiderian membrane is freed from the maxilla and elevated. During this elevation procedure, the space created between the residual maxillary ridge and the elevated Schneiderian membrane is filled with a grafting material. This way, a bone volume is created that may allow for implant placement, either simultaneously with the elevation procedure when the residual ridge allows for primary implant stability or at a second stage after healing of the grafted site.³ The lateral approach to sinus augmentation is a successful procedure, with percentages of success close to 100%.³⁵,²⁷,¹⁴ An alternative to the most commonly used lateral (major) window approach involves the apical displacement of crestal bone using the osteotome technique. The Summers Sinus floor elevation procedure, introduced by Summers [1994] is less invasive, less time-consuming and reduces postoperative discomfort to the patient.³³ The procedure consists of elevating the Schneiderian membrane with osteotomes through a crestal approach, placing simultaneously the bone grafting material and the implant. After a healing period of 3-6 months, implants are osseointegrated and become surrounded with bone over the implant apex.²³

Distraction osteogenesis

Distraction osteogenesis, first described in the treatment of long bone fractures by Ilizarov, is a procedure based on the gradual separation of a mobile but fully vascularised bone segment from the basal bone, leading to the formation of an intervening soft callus which gradually transforms to mature bone.¹⁶ Chin and Toth and Hidding et al. were the first to report clinical use of distraction osteogenesis for alveolar ridge augmentation. The technique involves freeing a bone segment (the transport segment) from the basal bone, but retaining attachment via the lingual periosteum.⁹ Gaggl et al. have described a simplified technique for alveolar ridge augmentation using “distraction implants”, which do not require subsequent removal. Studies have indicated that when implants are well fixed in the distracted bone and basal bone, they survive as long as implants in native bone and also the vertical bone loss, if any, was similar to that reported for implants placed in native bone. Although failures of implants have been reported in implants placed in distracted bone, most authors consider implantation following distraction to be a highly effective and useful technique.²⁶

Treatment without bone modification

Since the development of osseointegrated dental implants, the standard procedure has been to place implants vertically within the alveolar bone. However, when the amount of available bone in the maxillary alveolar crest is <10 mm in the vertical aspect and 4 mm in the horizontal aspect, the prognosis for implant treatment is poor. Alternative methods in which the severely resorbed alveolar crest is used for implant placement without bone grafting have been presented and include placement of implants in anatomic buttresses, palatal positioning of implants and the tilted placement of implants along the anterior maxillary sinus wall.²⁵

Anatomical buttresses

The skull presents a series of dense bony buttresses that conform a protective frame around the different craniofacial cavities such as orbit, nasal fossae or passages, oral cavity and paranasal sinuses with mostly fragile walls. These buttresses distribute forces through the solid facial bone structure, and are distributed strategically throughout the three facial thirds of the skull. In this context, the middle third portion presents two anterior buttresses namely, frontomaxillary and frontozygomatic buttresses and a posterior pterygomaxillary buttress.²⁹

Frontomaxillary or canine buttress

This region normally presents a compact cortical layer and dense medullary bone – thus allowing the placement of long implants with parasinusual angulation. Krekmanov and Rangert introduced implants parallel to the anterior wall of the sinus, combined with vertical implants in the anterior region, in a series of 20 patients.
This procedure made it possible to extend the fixed prosthesis ≥9 mm. No implants were lost during the 2 years of follow-up.17

**Frontozygomatic buttress**

This support is located in the region of the upper first molar, forming the so-called zygomatico-alveolar crest, which continues laterally along a concave trajectory to the zygomatic process of the maxillary bone and posteriorly, to the zygomatic bone. Two management options exist in this region.

**Trans zygomatic implants**

Trans-zygomatic implantation is a novel technique involving the positioning of two bilateral implants measuring between 35 mm and 55 mm in length, which are anchored to the zygomatic bone following an intrasinusal trajectory. These implants in turn must be combined with a minimum of two implants in the anterior sector and stent-fixated by means of a prosthetic superstructure.29 The availability of the zygoma implant has provided a viable alternative for treatment of extremely atrophied maxilla. The zygomatic implant is a self-tapping titanium implant with a machined surface, available in 8 different lengths of 30–52.5 mm. The threaded apical part has a diameter of 4 mm and a crestal part of 4.5 mm. The implant head has an angulation of 45° and an inner thread for connection of abutments in order to compensate for the inclination of implant insertion with respect to zygoma. The implant has an oxidized rough surface with a smooth body and wide crestal neck.

The authors consider that this variant affords improved contact between the bone and implant, with optimum implant positioning, and a better postoperative course.30 Balshi and Wolfinger reported the case of a 20-year-old patient presenting ectodermal dysplasia rehabilitated with two zygomatic implants in combination with four anterior implants and two implants positioned in the pterygomaxillary region – thereby avoiding graft-based maxillary reconstruction.5 A survival rate of 96-100% has been reported for this treatment modality.10,11,21,31

**Pterygomaxillary buttress**

Tulasne in 1989 described the technique for placing implants in this region. According to him, the pterygomaxillary implant should anchor in the pterygoid process or even traverse the latter, avoiding the posterior portion of the sinus and major palatal duct. To accomplish this, the implant should be directed posteriorly, superiorly and medially. The length of the implant is normally between 15 mm and 20 mm.32 In a study, Pi published the results of 177 pterygomaxillary implants in 136 patients, with a follow-up of 1-10 years. The success rate was 97.2%.7 As per the various studies the success rate of this technique was between 88% and 98%.36,34,3,12

**Mini-Implants**

Mini-implants were first introduced in the literature as the “Miniplant” by Barber and Seckinger, in 1994 with an external connection. This study was followed by Sendax, who considered the ultra-small single piece implant. The primary intention was to support an interim prosthesis, as it was expected these implants would be easily removed. However, it was noted that removal of these implants from the bone was difficult as they appeared to have osseointegrated. Histologic studies later confirmed that bone appeared to be integrated to the surface of the ultra-small implant at the light microscopic level, and the bone appeared to be mature and healthy.

The GOMI have defined the term mini implant as an “implant fabricated of the same biocompatible materials as other implants but of smaller dimensions. Implants can be made as one piece to include an abutment designed for support and/or retention of a provisional or definitive prosthesis”.20 The diameter threshold is not specified by the GOMI for these implants. Also, the literature is not clear regarding the terminology associated with reduced diameter implants. The terms mini implants, narrow diameter implants, and small diameter implants have been used interchangeably. Additionally, the use of terms such as provisional implants, transitional implants, and orthodontic implants has further added to the confusion. In spite of these multiple terminologies, no consensus on the definition of reduced diameter implants exists in the literature.

The advantages of using mini implants for definitive prosthodontic treatment are: Low cost, ability to be placed in narrow or wide ridges, simplified treatment procedures, flapless surgical procedure reducing postsurgical discomfort and morbidity for patients. Also, majority of miniimplants are designed as a
1-piece implant with the ability to immediately load the prosthesis. The disadvantages of mini-implants for definitive prosthodontics treatment are: the need for multiple implants because of the unpredictability and lack of current scientific guidelines and understanding; limited scientific evidence about long-term survival; potential for fracture of the implant during placement; lack of parallelism between implants is less forgiving because of the 1-piece design; reduction in resistance to occlusal loading. However, Bertil has recommended the use of miniimplants (preferably three implants) in clinical situations with vertical height of 5–8 mm and width of 4–5 mm, to support a posterior maxillary fixed prosthesis.13

Pterygoid Implants

The use of pterygoid implants was described by Tulsane JF in 1992 and was subsequently used by many other researchers. Pterygoid implants have the advantage of allowing anchorage in the posterior atrophied maxilla, eliminating the need of sinus lifts or bone grafts. In addition posterior cantilever can be eliminated and axial loading is improved. These implants can be placed in two different locations such as pterygoid process or in a most anterior position, the pterygomaxillary process. The findings in the literature show no clear differences between these two locations and no consensus exists regarding the nomenclature of these implants. However, the implant length and angulations vary between these two locations. Shorter implants are generally placed in the pterygomaxillary region with angulation of 10–20 to simulate the proper angulation of the third molar. On the other hand, the longer implants are anchored to the pterygoid plate of sphenoid bone.7

Tilted Implants

As early as 1999, tilting of dental implants in the posterior region of the jaw was demonstrated as an alternative to bone grafting for atrophied jaws. If the distal implant was tilted, a longer dental implant and a more posterior implant position could be achieved. The theory behind this philosophy was that a greater anterior-posterior position of implant would distribute the occlusal forces; therefore, the transverse force placed on the tilted implants would not be detrimental to them. In the maxilla, the distal implants could also get benefitted from the cortical bone wall of the sinus and the nasal fossa. Bellini et al. investigated the stress patterns at the bone-implant interface of tilted implants using three-dimensional finite element analysis and found that the numerical values of compressive stress were lower in the tilted implant configurations. He also found that tilting of the implants reduces the cantilever length by increasing the inter-implant distance. This may have produced a better load distribution, thereby reducing the stress level of the splinted implants. As a result, a biomechanical advantage is gained by using the tilted implants. Within the limitations, this study supports the use of tilted implants to treat the edentulous maxilla.6 Menini et al. has systematically reviewed 1,623 implants placed in the maxilla of 324 patients. Of these, 778 implants were tilted. The overall weighted cumulative success rate was reported as 98.62%. They have suggested the use of tilted implants for full-arch immediate loading rehabilitations of the maxilla with a favorable short term prognosis.

Conclusion

Maxilla is different in its function, physiology, and bone density from the mandible. These differences, along with its varied anatomy, challenge the implant placement in harmony with planned prosthetic restoration. However, a thorough knowledge of various augmentation procedures, materials and proper patient selection will result effective long-term solutions in the management of the atrophied maxilla. Important aspects that need to be considered for implant placement in posterior atrophic maxilla are discussed in this article and both surgical and non-surgical options are suggested. There is no consensus as to which treatment modality is superior to the other in literature. The decision to opt for either of the options, therefore, depends upon patient factors, and ultimately, the expertise and skill of the clinician.

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References


Psychosomatic Disorders Affecting Mouth- A Review Article

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Abstract

For the past few years, a gradual rise of psychiatric disorders representing a major public health problem came into being. Anxiety and depression are two most prevalent psychiatric diseases. Oral mucosa being reactive to emotional influences like stress, anxiety, depression, act as a window to reflect clues about overall health and sometimes it becomes the first sign of a disease. Often patients complain certain oral discomforts cause of which remain undetermined. These symptoms often thought of mental or emotion in origin and can be termed as “ORAL PSYCHOSOMATIC DISORDERS” representing a new category of syndrome called Medically Unexplained Oral Symptoms/Syndromes (MUOS). Often dentists find it challenging to treat such patients due to lack of any convincing physical explanation of the same. This review highlights the correlation between psychological factors and its subsequent responses on oral health resulting certain orofacial pathologies, struggles in handling patients, challenging treatment plans and involvement of counselling and psychiatrists referral at early stages which could ensure betterment of patient by early diagnosis of his or her mental status and treating the same.

Keywords: psychosomatic-disorders, burning mouth syndrome, psychosomatic dentistry.

Introduction

A wide spectrum of psychiatric disorders affects oral and paraoral structures which have a definite psychosomatic cause, but unfortunately they remain unrecognized because of common and limited nature of this presenting features (¹). The term psychosomatic derived from Greek word “psyche”and “soma”. “psyche” in earlier times meant soul and mind which now implies behaviour, “soma” refers to physical organism of the body. In 1818, German psychiatrist Heinroth was first to use the term “Psychosomatic”. In 1922, Deutsch introduces the psychosomatic medicines. Sigmund Freud systematically studied a case of now famous “Anna O” who was suffering from what then called hysteria (³). Many dental patients are seen coming with chief complaints of oral symptoms after dental treatment such as chronic pain or occlusal discomfort for which most of the time the cause remains undetermined (²). This makes the treatment challenging for the dentists especially in oral symptoms like chronic tooth pain or burning mouth syndromes where in most cases there is absence of any convincing physical manifestation leading to categorize them under psychosomatic disorders. Delusional diseases like Oral Cenesthopathy that is when patients become certain of the presence of foreign bodies in their oral cavity makes them stubborn and definitely negative towards the psychiatric referral by dentists. Thus by definition we can say that- “Psychosomatic disorders are defined as disorders characterized by psychological changes that originate partially from emotional factors”.

RELATIONSHIP BETWEEN “PSYCHE” AND “SOMA”

Two concepts to explain the relationship between “psyche” and “soma”
SPECIFIC HYPOTHESIS: Expression of a predetermined disease or illness occurs due to a specific stimulus or conflicts or stressors. After stress is suppressed through the ANS, however the sympathetic responses becomes alert for heightened aggression or flight or parasympathetic nervous system responses may be altered for increase vegetative activity. Such prolonged alertness and tensions can produce psychological disorders and eventually pathology of organ or viscera.

NON-SPECIFIC HYPOTHESIS: Generalized stress created the preconditions for a number of not necessarily predetermined diseases. According to hypothesis four varieties of reactions occur due to stress.

EFFECTS OF STRESS ON ORAL MUCOSA:

Oral cavity is one of the target areas on psychological state of human mind. It can reflect general health of individual. Stress response activates autonomic nervous system, mainly sympathetic via hypothalamic-pituitary-adrenal (HPA) axis, which secrete corticotropin-releasing factor (CRF) and Arginin-Vasopressin (AVP), leading to release of Adrenocorticotropic hormone (ACTH), eukaphalines, and endorphins. Thus stress response functions act as a positive, bidirectional feedback loop. Unlike under non-stressful conditions when both CRF & AVP are secreted in circadian and pulsatile manner with approximately 2-3 secretory episodes per day, these in acute stress are enhanced resulting increased ACTH and cortisol. Various other factors like Angiotensin II, Cytokines, and lipid mediators of inflammations are released which acts on various components of HPA axis potentiating its activity.

CLASSIFICATION FOR PSYCHOSOMATIC DISORDERS PERTAINING TO DENTAL PRACTICE BY SHAMIM (2014)

PAIN RELATED DISORDERS:

- Myofascial pain dysfunction syndrome (MPDS)
- Atypical facial pain
- Atypical odontogenic pain
- Phantom pain

DISORDERS RELATED TO ALTERED ORAL SENSATIONS:

- Burning Mouth Syndrome
- Idiopathic xerostomia
- Idiopathic Dysgeusia
- Glossodynia
- Glossopyrosis

DISORDERS INDUCED BY AUTOIMMUNE DISORDERS:

- Oral lichen planus
- Recurrent Aphthous stomatitis
- Psoriasis
- Mucous membrane pemphigous
- Erythema multiforme

DISORDERS INDUCED BY NEUROTIC HABITS:

- Dental and Periodontal diseases caused by bruxism
- Biting of oral mucosa (self mutilation)

DISORDERS CAUSED BY ALTERED PERCEPTION OF DENTOFACIAL FORM AND FUNCTION:

- Body dismorphic disorder

MISCELLANEOUS DISORDERS:

- Recurrent herpes labialis
- Necrotizing Ulcerative gingivostomatitis
- Chronic periodontal disease
- Cancerophobia
- Delusional Halitosis

MYOFASCIAL PAIN DYSFUNCTION SYNDROME: It became topic of interest in both medical and psychological fields over past two decades. The conventional definition of myofascial pain syndrome is characterize by regional pain originating from hyperirritability spots located within taut bands of skeletal muscles, known as Myofascial trigger Points (MTrPs).

SIGNS AND SYMPTOMS: Unilateral dull pain in
the ear or preauricular region that commonly worsens on awakening, tenderness of one or more muscle of mastication on palpation and limitation or deviation of the mandible on opening.

**RECURRENT APHTHOUS STOMATITIS**
Most common type of ulcerative disease of the oral mucosa. There are three variants described—Minor, Major, Herpetic-form. Etiology is multifactorial—Trauma, stress, Hormonal, immunologic, drugs etc. Psychological stress may play a role in the manifestation of Recurrent Aphthous Stomatitis, and it may serve as a trigger or a modifying factor rather than being a cause of the disease.

**IDIOPATHIC XEROSTOMIA**: Xerostomia is defined as the subjective feeling of oral dryness and it is the result of salivary gland hypofunction. Xerostomia is a common complaint among older adults and 30% of population aged 65 and more prevalent in post menopausal women than men. Etiology—multifactorial. The sensation of dry mouth may be regarded as a subjectively felt Somatic Symptom. Mason and Glen (1967) have stated that as the secretion of saliva is regulated by ANS and is subjected to reflex stimulation from physical and psychic causes, then xerostomia may result from four basic causes in which factor affecting salivary centre are primary cause—emotions, fear, excitement, stress, Depression. Diseases like: brain tremor, Parkinson’s disease, Drugs like antidepressants, anticonvulsants, antipsychotics, anticholinergics and alpha-agonists.

**ORAL LICHEN PLANUS**: Oral Lichen Planus is a mucocutaneous disorders which affect skin, oral and other mucous membranes. Among all forms Erosive form of Oral Lichen Planus is commonly associated with Psychotic factors. Though etiology of lichen planus is not clear but various psychological factors contributing to pathogenesis of lichen planus are stress, anxiety, depression and increased cortisol level; MEDICALLY UNEXPLAINED ORAL SYMPTOMS: Patients with “oral psychosomatic disorders” are reluctant to accept diagnosis since the problem is purely psychogenic. He reported that the estimated prevalence of MUOS among dental patients ranges from 5-10% or more.

**CHRONIC ORAL PAIN**: Burning Mouth syndrome, Atypical odontalgia. The impact of chronic oral pain on quality of life should not be ignored. Burning Mouth Syndrome and Atypical odontalgia both are chronic pain disorders that occur without any evident cause, and they are often regarded as psychogenic conditions. Few patients with chronic oral pain are treated with psychiatrists. Burning Mouth Syndrome are characterized by a burning sensation involving tongue or other oral sites, usually in the absence of clinical and laboratory findings. Patients with Burning Mouth Syndrome are often informed about their clinically normal oral cavity even though they have severe pain and thus do not receive any treatment. They become at last frustrated, anxious and worried about serious diseases like Cancer. Compared to Burning Mouth Syndrome, Atypical Odontalgia is not as commonly seen in other medical settings and has received substantial attention from dentists in recent years. Association for the Study Of Pain defines Atypical Odontalgia as severe throbbing pain in a tooth without major pathway. Ineffective treatment of this type of chronic dental pain often is considered to be treatment failure. Thus repeated ineffective dental treatment like Root canal, Filling even Dental extractions are carried out which further results in iatrogenic changes to the treated tooth leading difficulty in performing further diagnostic evaluations. The lack of knowledge about pathophysiological mechanisms of this pain conditions can be considered as a major reason for problems in their diagnosis and management.

**ORAL CENESTHOPATHY**: Characterized by foreign body sensations despite the lack of any medical evidence for them. Also can be called as oral Dyesthesias or Somatic Delusions. There are certain unusual complaints regarding oral cesthopathy like some patients would complain of unusual oral sensations such as excessive mucus secretion or a slimy sensation, and others complain of a bizarre oral sensations such as a feeling of coals or wires present within oral cavity.

**HALITOPHOBIA**: Some patients complain of oral malodour that is in-perceptible to others. These patients are categorized under halitophobia or delusional or psychosomatic halitosis. A related disorder, Olfactory reference syndrome (ORS), which is called “Jikoshu-Kyofu” in Japan, a condition where patients believe that they are exuding unpleasant odour. It has been reported that 75% of his Olfactory Reference Syndrome patients were preoccupied with bad breath. These patients are actually halitophobic.
OCCLUSAL DISCOMFORT: Occlusal discomfort is a problem unique to dentistry, some patients irritate their dentists because of their unreasonable complaints, demands and incomprehensible claims concerning dental treatment. PHANTOM BITE SYNDROME (PBS) characterized by persistent uncomfortable sensation of occlusion without evidence of occlusal discrepancy. Patients complain that their occlusion is wrong and their “bite is off.” They thus visit multiple dentists for bite correction.

ODONTOPHOBIA: The provocation of anxiety by dental treatment is universal phenomenon. Can be variously called as dental phobia. These patients due to their extensive dental anxiety often suffer from various dental problems owing to their avoidance of seeing a dentist.

CANCEROPHOBIA: The belief that cancer inevitably leads to death is widespread. This may contribute to society cancerophobia and with subsequent frequent delays in seeking medical attention and treatment for suspected cancer.

DYSMORPHOPHOBIA: Belief in a cosmetic defect in a person of normal appearance. These patients often seek treatment to correct the supposed deformity. The complaints may range from mild unattractiveness to ugliness. Since face and its components like teeth, nose, mouth, ears, eyes and chin make up a large percentage of structures for which patients seek and undergo cosmetic surgery.

PRIMARY DYSMORPHOPHOBIA- is neurotic or psychotic characteristic diagnosed in the absence of any other psychiatric illness.

SECONDARY DYSMORPHOPHOBIA- arises secondary to depression, schizophrenia, anxiety

DENTAL AND PERIODONTAL DISEASES CAUSED BY BRUXISM: Bruxism is the excessive grinding of the teeth which is a parafunctional activity. This results in many dental problems such as abrasions, hypersensitivity, periodontal destructions, temporomandibular joint dysfunction. Exact pathology is unknown, however stress, anxiety play a vital role and considered risk factors. Behavioral problems and potential emotional problems have been found to be potential risk factors for bruxism in children.

NEUROENDOCRINE BIOMARKERS:

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<thead>
<tr>
<th>PARAMETERS</th>
<th>RESPONSES TOWARDS STRESS</th>
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<tbody>
<tr>
<td>CORTISOL</td>
<td>CHRONIC STRESS-lower than normal level in morning. Higher than normal in the evening</td>
</tr>
<tr>
<td>DEHYDROEPIANDROSTERONE</td>
<td>CHRONIC STRESS - Reduced</td>
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<tr>
<td>ADRENALINE</td>
<td>CHRNIC STRESS - low adrenaline responsivity ACUTE STRESS - Elevation of level</td>
</tr>
<tr>
<td>NORADRENALINE</td>
<td>CHRONIC STRESS-Decrease in release of brain noradrenaline ACUTE STRESS :- Elevation of both plasma and brain nor-adrenaline</td>
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**METABOLIC MARKERS** :-Since metabolic changes are quantifiable they can be used as biomarker in chronic stress.

<table>
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<tr>
<th>PARAMETERS</th>
<th>RELATION IN RESPONSE TO STRESS</th>
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<tbody>
<tr>
<td>SERUM CHOLESTEROL (NORMAL:120-250mg/dl)</td>
<td>Decreases with chronic stress level</td>
</tr>
<tr>
<td>SERUM ALBUMIN (NORMAL:3-6g/dl)</td>
<td>Reduces the level by either increasing the rate of degradation or decreasing the rate of synthesis</td>
</tr>
<tr>
<td>WAIST-HIP RATIO</td>
<td>Higher for chronically stressed individual as greater vulnerability to stress increases exposure to stress-induced cortisol which in turn fuels central fat deposition (40,41)</td>
</tr>
<tr>
<td>GLYCOSYLATED HAEMOGLOBIN</td>
<td>Chronic stress linked to hyperglycaemia which in turn increase the levels of glycosylated haemoglobin</td>
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**IMMUNOLOGICAL BIOMARKERS** :-Change in circulating level of cytokines can be used as biomarkers like IL-6, TNF-alpha, CRP and IGF-1. Studies suggested that chronically stressed individual are biased towards a humoral immunity oriented cytokine production, for unknown reasons. (42)

**MANAGEMENT**:-Can be classified as: Management of Diseases with psychological factors playing important role in pathogenesis and Management of Medically Unexplained oral Symptoms.

**MPDS (MYOFASCIAL DYSFUNCTION SYNDROME):** A number of successful treatment outcomes have been reported, including occlusal splints, physiotherapy, muscle relaxing appliances (43). Tricyclic antidepressants as Amitriptyline and Nortriptyline and cognitive behavioral therapy are often generally helpful.

**MANAGEMENT OF IDIOPATHIC XEROSTOMIA:**

**PATIENT EDUCATION** : Patients should receive detail information about potential causes of dry mouth. Patients thus be encouraging to have preventive oral health care such as dental hygiene habits and regular dental visits. Another palliative action to minimize symptoms and prevent oral complications is water intake, drinking water frequently and remaining hydrated.

**PREVENTIVE THERAPY** : It includes use of chemical radiotherapy protectors to improve the therapeutic index in radiotherapy. However vast majority of these are too weak in terms of radioprotection, too toxic or without any apparent mechanisms to ensure selective normal tissue protection. Some of these compounds are Sulphydryl compound, Amifostine Ethylphosphorothioic acid which is an oxygen scavenger that may protect salivary glands from free radical damage during radiation therapy without attenuation of the Anti Tumor effects in many experiments performed. Amifostine has been approved for prevention of xerostomia in head and neck squamous cell carcinoma patients undergoing radiotherapy (45).

**SYMPTOMATIC TREATMENT:** saliva substitute are available in various formulation examples like lozenges, sprays, mouth rinses, gels, oils, chewing gums or toothpastes. Most available in market is Carboxymethylcellulose (CMC), mucins, Xanthan-gum, hydroxyethylcellulose, linseed oil, or polyethylene oxide (46). Advances in hydrogel technologies and development of buccal mucoadhesive polymers, allows continuous release of substances that maintain oral hydration and also dental benefits. (47)

**ORAL LICHEN PLANUS MANAGEMENT** :- A positive response to medium potency corticosteroid treatment, such as acetate triamcenolone 0.1% powerful fluorinated steroids as flucinolone acetonide 0.05% and 0.1% and more high potency halogenated corticosteroids like clobetasol propionate 0.05%. Surgical excision, cryotherapy, CO2 laser and ND.YAG laser have all been used in the treatment of Oral Lichen Planus.

**MANAGEMENT OF RECURRENT APHTHOUS ULCER**: Antiseptic alcohol free
mouthwash, spray or gel (chlorhexidine gluconate) may be recommended (48).

**MANAGEMENT OF IDIOPATHIC DYSGEUSIA:** Zinc supplementations aid in treating taste disorders by promoting proliferation of normal taste buds even in patients without zinc deficiency (49).

**MANAGEMENT OF MEDICALLY UNEXPLAINED ORAL SYMPTOMS (MUOS)**

Patients of this category tend to keep on develop newer symptoms once the previous one get obliterated. Even with obvious improvements these patients tend to concentrate on the minimal symptoms and keep on irritating the concerned dentists with the same. They are reluctant to listen to the advice of the dentists and keep pestering for new treatment plans. This makes the dental treatment more difficult although the efficacy of treatment with antidepressants is certainly important, patient dentist interactions are more critical (50). New type of dentistry called “psychosomatic” dentistry has to play a vital role in managing such patients where patients’ mental and oral status has to be understood and therapeutic techniques are implemented accordingly. Psychiatric referrals also becomes difficult for these patients since they are most often reluctant to go to the psychiatrist and the psychiatrist also do not able to understand oral complaints without the vivid knowledge about dentistry. Psychiatric also dislike patients with constant dental complaints wanting no business with them-which make the matter worse. But however it has been reported that some patients with MUOS are thought to actually have psychiatric conditions like depression, bipolar disorder and severe obsessive-compulsive disorders. Dentists should have sufficient training to be able to recognize such mental disorders (51) so that patients are not shunted between dentists and psychiatrists.

**Conclusion**

Mind and Body are interconnecting. Dentists come across these type of patients on daily basis. Hence, sufficient training of the dentist to successfully recognize the problem and efficient management accordingly has become a necessity in modern and developing world which is under constant stressful lifestyles. This entity opens up a bridge between dentistry and psychiatry also can be called as Psychological Dentistry. So Psychiatric department separately could be an important part of Dental hospitals where early referral and subsequent counselling can improve the condition.

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Eagles Syndrome- A Case Report with Literature Review

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Abstract

The symptoms brought by compression of vital neurovascular and muscular elements adjoining the styloid process due to elongation of styloid process or ossification of the stylohyoid or stylomandibular ligament, is termed as Eagles syndrome. Reporting a case of a 27 year old patient diagnosed with Eagles syndrome.

Keywords: Syndrome, orthopantomograph, Facial, Glossopharyngeal

Introduction

First elucidated by the American otorhinolaryngologist Watt Weems Eagle in 1937, Eagle syndrome (ES) or stylohyoid syndrome (SS), a rare condition that occurs due to elongation of the styloid process or calcification of the stylohyoid ligament, characterized by painful sensation in the head and neck region.¹,²

The normal styloid process measures approximately 2.5–3.0 cm in length, exceeding which is said to be an elongated styloid process.² Most of the patients with styloid elongation are asymptomatic and only four percent of affected individuals are known experience the symptoms.³ Symptoms are experienced only when the elongated ossified structures exert pressure on the various vital structures in the cervico-facial region. Symptoms include pain in cervico-facial region, pharyngeal discomfort, painful neck movements, change in voice, painful tongue movements, increased secretion of saliva, otalgia and headache.

Tip of elongated styloid process can be felt by digital palpation over the tonsillar fossa, if pain is reproduced or referred to face, head, neck or ear the presumptive diagnosis of elongated styloid process is very likely to be present.

Radiographic imaging serves the ultimate investigative tool in establishing the diagnosis. The radiographic views includes orthopantomograph (OPG), lateral-oblique mandible, lateral head and neck radiograph and Towne radiograph plain film etc. A threshold length of 3 cm is accepted as abnormal by current conventions. Lateral views are the best to show the length of the styloid process, but antero-posterior views are also required to determine bilateral involvement and lateral deviation. Computed tomographic scans have proven to be useful in difficult cases to endorse diagnosis, especially with 3-D reconstruction it possible to envision the exact spatial orientation of the styloid processes.

Medical and surgical management are available for treating styloid elongation, the former can provide only short term relief. Conservative treatment modalities included transpharyngeal injection of local anaesthetics (lignocaine) and corticosteroids, nonsteroidal antiinflammatory agents (NSAIDS), diazepam, application of heat and traditional Chinese herbs. Transpharyngeal manipulation with manual fracturing of the styloid process, does not usually relieve symptoms, but also has the risk of damaging the nearby neurovascular structures. The most satisfactory and effective treatment is surgical shortening of the styloid process through either an intraoral or external approach.⁴

Case Report: A 27 year old female patient complained of pain in throat region which radiated to the head, neck, shoulder and ear region. The patient has...
been experiencing pain since 3 years. Pain is intermittent, fluctuating between moderate to severe in intensity and aggravates on turning the head, also complains of tinnitus at times with otalgia. Past surgical history revealed that patient had undergone tonsillectomy 15 years before. On clinical examination odontogenic and temporomandibular joint related cause was ruled out, tenderness was present on bilateral palpation over the peritonsillar fossa and tip of styloid process was felt. Radiographic evaluation of the OPG revealed bilateral elongation of the styloid process (Figure 1), confirming diagnosis of Eagles syndrome.

**Figure 1: OPG revealing the presence of bilateral styloid elongation.**

**Discussion**

ES is a clinical condition, where there is abnormal ossification of the stylohyoid apparatus, consisting of the styloid process, attached stylohyoid ligament and the lesser cornu of the hyoid bone.[5] Eagle hypothesized two types of the syndrome, the Classic type and the Carotid artery type. Classic type often noticed in patients with history of tonsillectomy and arises secondary to the stimulation of the Trigeminal, Facial, Glossopharyngeal and Vagus cranial nerves or their associated branches. Eagles speculated that post tonsillectomy, these individuals develop scarring near the styloid apex which subsequently compresses or stretches nerve structures in the space surrounding the styloid process, causing pain. In carotid artery type, the styloid process gets associated with the carotid nerve plexus and causes a foreign body sensation in the pharynx and cervical pain on rotation of the head. The present case is of classic type, reported with history of tonsillectomy and experienced pain in throat often radiating to the head, neck, shoulder and ear region, pain often aggravating while turning the head. The patient also experienced tinnitus at times with otalgia. Clinically tip of the elongated styloid process is felt on digital palpation over the tonsillar fossa, which also precipitates pain, also evidenced in the present case. OPG confirmed the presence of bilateral styloid elongation.

Partial and complete calcification of the stylohyoid ligaments, have been reported in literature.[5] The present case didn’t show any evidence of calcification associated with stylohyoid ligament.

Compression on internal carotid artery due to styloid elongation, can lead to transient ischemic attack. Vagus mediated cardiac inhibition due to ES causing sudden death has been recorded in literature and only during the autopsy it was revealed that the elongated styloid process had been compressing both the carotid sinuses, radiographic films had failed to show the anatomical changes.[6,7]

It is easy to misinterpret ES and associated differential diagnosis, for instance ES can be atypically present as exertional headache, beginning in the right ear and radiating to the neck and to the vertex, similar kind of pain distribution was noted in the present case.[8,9] Another reported case was with diffuse bilateral stylohyoid chain ossification which can mimic symptoms of ES was diagnosed as temporomandibular joint disorder.[10]

Radiographic imaging plays a key role in providing a confirmatory diagnosis. Plain film radiography is sufficient to show the elongation, but CT scans seems to provide a better visualization of the styloid elongation and adjoining neurovascular and muscular elements.

**Conclusion**

ES can be mistaken for many other conditions, which can be excluded by eliciting detailed history, clinical examination, and radiological investigations. The fact that styloid process with normal length is not normally palpable, and simple digital palpation over the tonsillar fossa can help us arrive at a presumptive diagnosis. Definitive diagnosis can be arrived only with radiographic evaluation. Resection of the elongated styloid process is the treatment of choice for long term benefit.

**Ethical Clearance** – Not needed as it is review article

**Source of Funding** – Nil
Conflict of Interest – Nil

References


Assessment of Articular Disc Position before and after Gnathological Splint Therapy in Symptomatic Temporomandibular Disorder Patients Using Magnetic Resonance Imaging

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Abstract

Introduction: Early and accurate diagnosis followed by therapy would be the ideal approach to reduce pain, discomfort or morbidity associated with temporomandibular disorders. The purpose of the study was to evaluate if gnathological splint therapy could capture or change the position of the displaced articular disc in temporomandibular disorder subjects using magnetic resonance imaging as the diagnostic tool.

Materials and Method: The study population consisted of 14 clinically symptomatic and orthodontically untreated temporomandibular disorder patients within the age range of 12-30 years (mean 20 years). The patients underwent gnathological splint therapy for six months and the pre and post articular disc position was evaluated with Magnetic Resonance Imaging.

Results: The amount of articular disc changes post splint therapy was almost similar on both the right and left side of the TMJ, with a mean difference of 1.4mm on right side and 1.3mm on left side.

Conclusion: Articular disc recapture was seen in patients having anterior disc displacement with reduction subsequent to gnathological splint therapy.

Keywords: temporomandibular disorder, Roths’ power centric bite, gnathological splint, mandibular positioner indicator.

Introduction

Temporomandibular disorder (TMD), a widely debated topic continues to generate interest among the orthodontic fraternity. In 1950s more emphasis was placed on the alignment of teeth, stability of intercuspal position, esthetic value of proper tooth positioning and the effect of improper occlusion on masticatory muscle function. Ronald Roth(1981) highlighted the importance of orthodontic treatment planning to the musculo-skeletonally stable position of the TMJ, prescribed a mutually protected occlusal scheme for stability and advocated the use of splints to deprogram the muscles in centric discrepancy cases. It was opined that the condylar slide from centric relation to maximum intercuspation should not be more than the permissible limits in the antero-posterior(A-P), vertical and transverse plane and if the slide exceeded the limits it may predispose the patient to TMD.¹ ³

Magnetic resonance imaging (MRI) is currently the most accurate imaging modality for identification of disk position in the TMJ. It does not produce any adverse effects nor poses any significant risks outside those found in daily living at the field strength used for imaging.⁴⁵⁶
Materials and Method

The study population consisted of 14 clinically symptomatic and orthodontically untreated TMD patients within the age range of 12-30 years (mean age 20 years) who reported to the Department of Orthodontics, Sree Balaji Dental College and Hospital, Chennai. Institutional Ethical Committee clearance was obtained for the study. The study procedures along with the possible complications were verbally explained to all the patients and written consent was obtained.

Fabrication of gnathological splint

Maxillary and mandibular impressions were taken using an irreversible hydrocolloid impression material in sterilized metal rim-lock trays. Face-bow transfer records were taken using the Axioquick Expansion Kit AX, (SAM Prazisionstechnik GmbH, Fussbergstr 1, Germany) to record the relationship of the maxilla to the cranium.\(^7\) (Fig. 1)

Centric Occlusion (CO) Bite registration

A thin dimensionally stable piece of Miltex beauty wax was used to record the patient’s habitual occlusal position or CO. It was softened in warm water and the bite was taken. The CO bite is an important record used along with the CR bite in quantifying condylar displacement with Mandibular Position Indicator (MPI).

Centric Relation (CR) Bite Registration

This method was used to obtain the best achievable seating of the condyles in the fossae for that day. A true CR can be registered only after the stabilization of condylar position.

Centric relation bite (Roth power centric bite) (Fig 2) was taken with Delar bite registration wax, one in the anterior region and the other in the posterior region.\(^8,9\)

MPI Data

MPI data consists of three graphs: right and left sagittal graphs and a transverse graph [Fig 3]. The graph at the bottom quantified condylar displacement in the frontal plane. A discrepancy of greater than 0.5mm in both the planes was an indication for treatment.

Articulation

The maxillary model was mounted using face-bow transfer record to the articulator with the mounting plate and mounting plaster (Fig 4). The incisal guide pin was adjusted to a level of 3mm above the point of first tooth contact (fulcrum) to provide space for splint fabrication. Splint was fabricated with cold cure acrylic resin. It was then inserted in the patient’s mouth and checked for centric stops and mutually protected occlusal pattern. The patient was advised to wear the splint full time.

Protocol demanded that the patient be recalled every month and the splint be checked for centric stops and mutually protected occlusal pattern.\(^10\) It has been reported that reduction in muscle stiffness and lesser resistance exhibited by the mandible was due to deprogramming of the muscles by the splint.\(^11\)

MRI was taken pre and post treatment and the following measurements were done.

Establishment of Reference Points/Plane

To measure the articular disc position in pre and post splint MRI, the following stable reference points/plane were established.

Reference plane (RP): Line that connected the superior most point in the glenoid fossa to the inferior most point on the articular eminence.

Condylar loading point (CLP) - A stable point on the condylar head. Determination of the loading surfaces of the condyle and the posterior slope of the articular eminence was based on the biomechanical model of Smith et al.\(^12\) It was assumed that condylar reactionary forces during maximum intercuspation was directed essentially perpendicular to the posterior slope of the articular eminence and that the CLP corresponded with the closest joint space perpendicular to the posterior slope of the articular eminence.\(^12-16\) Condylar reactionary forces were assumed to act through an angle of 32.5 degrees superior and 32.5 degrees inferior to the perpendicular to the posterior slope of the articular eminence through the CLP during unilateral biting.\(^12\)

Midpoint of the articular disc – A point designated in the middle of the intermediate band of the articular disc (thinnest portion of the disc).

Measurement criteria

The midpoint of the intermediate band of the articular disc usually corresponds with the CLP in normal and
healthy joints without disc displacement. Any difference between these two points is measured in mm from the midpoint of intermediate band of the articular disc to the perpendicular line projected from RP to CLP (Fig 5).

**Results**

The mean value was 2.507(mm) in the right side TMJ before treatment and 1.107(mm) after treatment. The difference between the two effectively gave the change in articular disc position in the right side joint. The position of articular disc showed improvement towards the normal. In four patients, the articular disc position was recaptured completely and partial recapture was achieved in the remaining patients.

The mean value was 1.936(mm) in the left side TMJ before treatment and 0.636(mm) after treatment. The difference between the two effectively gave the change in articular disc position in the left side joint. The position of articular disc showed improvement towards the normal. In five patients, the articular disc position was recaptured completely and partial recapture was achieved in the remaining patients.

Test of significance using paired t- Test showed a statistically significant difference (p=.000) in the articular disc position before and after treatment, with the mean difference of 1.4mm on the right side after treatment with the splint. (Table 1).

Test of significance using paired t- Test showed a statistically significant difference (p=.000) in the articular disc position before and after treatment, with the mean difference of 1.3mm on the left side after treatment with the splint. (Table 2).
Table 1: Test of significance using paired t-Test showed a statistically significant difference (p=.000) in the articular disc position before and after treatment in the Right joint.

<table>
<thead>
<tr>
<th>Pre Vs Post Treatment (Right Joint)</th>
<th>Mean Value</th>
<th>Mean Difference</th>
<th>Standard Deviation</th>
<th>Paired t value</th>
<th>Significant p value</th>
</tr>
</thead>
<tbody>
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<td>Pre treatment</td>
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<td></td>
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<td>5.629</td>
<td>.000</td>
</tr>
<tr>
<td>Post treatment</td>
<td>1.107</td>
<td>1.4000</td>
<td>0.9307</td>
<td>5.629</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 2: Test of significance using paired t-Test showed a statistically significant difference (p=.000) in the articular disc position before and after treatment in the left joint.

<table>
<thead>
<tr>
<th>Pre Vs Post Treatment (Left Joint)</th>
<th>Mean Value</th>
<th>Mean Difference</th>
<th>Standard Deviation</th>
<th>Paired t value</th>
<th>Significant p value</th>
</tr>
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<tbody>
<tr>
<td>Pre treatment</td>
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<td>1.3000</td>
<td>0.9106</td>
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<td>.000</td>
</tr>
<tr>
<td>Post treatment</td>
<td>0.636</td>
<td></td>
<td>0.9106</td>
<td>5.342</td>
<td>.000</td>
</tr>
</tbody>
</table>

Discussion

Temporomandibular joint internal derangement (TMJ-ID) is a disorder which is related to articular disc-condyle disharmony characterized by clinical signs and symptoms such as limitation of mouth opening, joint sounds, deviation and deflection during mouth opening and closing. It also has a significant effect on the growth and development and normal functions of the orofacial structures.\textsuperscript{13-16} Disc displacement with reduction occurs when the disc is placed anteriorly relative to the condyle and the condyle passes over the thick posterior band of the disc at the beginning of mouth opening. Painful clicking may occur at this time. Once maximum opening has occurred, the condyle can capture the disc, and a normal relationship occurs between the condyle and
the disc. However, in maximum intercuspation, the disc once again becomes situated anterior to the condyle.\textsuperscript{17}

It has been reported that clinical examination for the diagnosis of anterior disc displacement with reduction has an accuracy of 43–75%.\textsuperscript{18} This suggests that a clinical examination should be done together with other imaging methods in order to determine the relationship between the articular disc and condyle. Arthrography and Computed Tomography are 2 imaging methods generally employed for diagnosis of a TMJ-ID.\textsuperscript{19,20} In recent years, magnetic resonance imaging (MRI) has been used because it is an effective, noninvasive method that does not appear to cause any biological hazard.\textsuperscript{21-22}

Disc-repositioning appliance has been widely used and accepted in the treatment of disc displacement with reduction.\textsuperscript{23-24} Splints are thought to work by reducing the amount of parafunctional activity and limiting the extent of potentially harmful movements.\textsuperscript{25-26} Dawson\textsuperscript{27} and Okeson\textsuperscript{28} insisted that the condyles should be seated against the articular disc in their most supero-anterior position against the postero-superior slope of the articular eminence and centered transversely. Gnathological splint deprograms the muscles from the distracted position and moves the condyle to a more optimal and stable CR position. It is important to establish centric occlusion (CO) in CR position (CR = CO).\textsuperscript{29} Roth power centric bite was chosen to record the maxillo-mandibular relationship because it avoids tooth contact and allows the patient’s own mandibular elevator muscles to seat the condyles in a producible neuromuscular position which is CR.\textsuperscript{30-31}

The influence of disc-repositioning splints on the disc position has been studied by various authors. Our study was however designed to study the exclusive effect of the gnathological splint on articular disc position.

MRI was selected for use in this study because of its high specificity for identification of condyle disc relationships. Kurita et al\textsuperscript{32} indicated that the recapture of the disc by disc-repositioning splint therapy could be established clinically at a rate of 70%. However, they also suggested that clinical results should be supported with MRI because of the high rate of false-negative clinical results after application of a disc-repositioning splint, a point reiterated by Ikeda K et al.\textsuperscript{32} The reference points (CLP, RP, midpoint of articular disc) used for measurements in MRI were according to Smith et al\textsuperscript{33} and Nebbe et al\textsuperscript{33}. Condylar reactionary forces during maximum intercuspation were directed essentially perpendicular to the posterior slope of the articular eminence and that the CLP corresponded with the closest joint space perpendicular to the posterior slope of the articular eminence.\textsuperscript{12,34-36} Nebbe et al\textsuperscript{33} and Smith et al\textsuperscript{33} used CLP, glenoid fossa, Frankfurt horizontal plane, posterior slope of articular eminence, and midpoint of articular disc as reference points. They had used reference planes transferred from corresponding lateral cephalograms to assess disc length and displacement.\textsuperscript{12,33} Our study used glenoid fossa, CLP, articular eminence and midpoint of articular disc as landmarks for measurements with the landmarks modified slightly to avoid using multiple imaging techniques like cephalogram and CBCT and undue radiation exposure.

Improvement in articular disc position after 6 months of splint therapy was observed with a significant statistical difference in mm improvement in the articular disc position. The measurements clearly indicated that the articular disc had moved favourably towards the normal position. All the patients demonstrated significant improvement in disc position with four of them showing complete disc recapture and the rest partial recapture. In a similar study done by Hatice et al\textsuperscript{17} unilateral partial capture of articular disc (right TMJ) was observed on bilateral MRI scans in contrast to our study where bilateral disc capture was observed. Also, all their subjects exhibited partial recapture while the subjects in our study showed complete bilateral recapture in four and partial recapture in the rest. Gnathological splint was used full time even during function for a duration of six months in contrast to Hatice et al\textsuperscript{17} methodology where the duration of splint wear was 9 weeks and removal during meals. Another similar study done by Eiji Tanaka et al\textsuperscript{37} showed lack of disc recapture when splint was worn for 9 weeks only at night time.

**Conclusion**

Articular disc recapture was observed in all the 14 subjects exhibiting anterior disc displacement with reduction treated with gnathological splint therapy.

The amount of favourable articular disc changes, post splint therapy were almost similar on both the right and left side of the TMJ, with a mean difference of 1.4mm on right side and 1.3mm on left side.
Complete disc capture was observed in four subjects with partial capture in the remaining ones.

MRI supported the clinical results with great specificity.

**Ethical Clearance** – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/TN/2015)

**Source of Funding** – Nil

**Conflict of Interest** – Nil

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A Literature Review of Temperomandibular Disorders in Orthodontics - A Goal Directed Approach

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Abstract

Temporomandibular Joint Disorder (TMD) is a collective term embracing several clinical problems that involve the masticatory musculature, the temporomandibular joint (TMJ). The concept of occlusion, condylar position, and its relationship to orthodontics has been a source of controversy over the years. Although goals of orthodontic treatment include alignment and stability of tooth positions, periodontal health, optimal facial and dental esthetics, and a functional occlusion, the interrelationship of these factors and condylar position is largely unknown.

Keywords: Temporomandibular Joint, Articular eminence, Condyle, Mandible.

Introduction

Temporomandibular Joint Disorder (TMD) is a collective term embracing several clinical problems that involve the masticatory musculature, the temporomandibular joint (TMJ). Gnathological treatment goals also include equal maximum intercuspation-centric relation (MI-CR) condylar position with the articular disc in place, a mutually protected occlusion (cuspid rise and anterior guidance with posterior disocclusion), centric stops to all centric cusps, and a Class I buccal segment relationship with a 3-mm overbite and a 3-mm overjet.

Centric Relation is defined as the “maxillomandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective discs with the condyles in the anterior superior position against the slopes of the articular eminence. This position is independent of tooth contact.” Centric occlusion is defined as “the occlusion of opposing teeth when the mandible is in centric relation”. This may or may not coincide with the MI position.

The association between orthodontic treatment, abnormal condyle and disc position, and temporomandibular disorders (TMD) has been studied for many years.

Temporomandibular Joint Disorder (TMD) is a collective term embracing several clinical problems that involve the masticatory musculature, the temporomandibular joint (TMJ) and associated structures, or both.

The relationship between occlusion, occlusal factors and temporomandibular dysfunction remains a controversy. However it is believed that occlusal factors play a significant role predisposing to TMD. Therefore loss of vertical dimension, number of contacting teeth, orthodontic malocclusion (specifically, crossbite, anterior open bite, and deep bite), occlusal interferences, and deflective contacts are some of the important contributing factor in TMD.

Okeson reported that a premature contact can make the condyle to displace from the disk as the mandible pivots from this premature occlusal contact and moves into maximum intercuspation. This takes place due to neuromuscular adaptation eventually resulting in maximum intercuspation of teeth without taking into account the final condylar position. Thus the resulting condylar displacement may be considered a specific etiological factor predisposing to TMD signs, symptoms, and dysfunction.
Roth has also emphasized the relationship of TMD and occlusal interference and has advocated the importance of treating patients to centric relation.

The seated condyle position/centric relation is an anatomically determined position that is considered to be repeatable and reproducible. Okeson describes it as most orthopaedically and musculoskeletally stable position of mandible that is essential for optimal TMJ form and function. Therefore determination of CR is a preparation for analysing the condylar position and skeletal malrelationships. There is sufficient evidence to show that a difference exist between the MIC/CO, determined by full intercuspation of opposing teeth and where the condyles are in CR. This positional difference is known as condylar displacement.

Larger displacements were observed in all the dimensions for symptomatic patients, predominantly in vertical and sagittal plane. However Solberg found a higher prevalence of TMD signs and symptoms in subjects with a transverse occlusal slide.

The Need For Instrumentation

Condylar displacement must be isolated as a specific etiological factor in TMD. Various 3 dimensional methods have been used to assess the condylar position nevertheless. Dental instrumentation (an articulator mounting in the SCP/CR and condylar graph measurements) has proven to be valid, reproducible, accessible, cost-effective, non-invasive, and highly accurate. The articulators provide an added dimension that helps in gathering more information of the pre-treatment occlusion in static occlusion and also permits the visualization of various functional movements. It helps in measuring the quantum of centric relation-centric occlusion discrepancy and also to determine the first point contact in centric relation. Hand-held dental casts do not help in achieving orthopaedic stability in this regard. They can mislead the practitioner, since they do not relate to the temporomandibular joint position and also displays only the interarch relationship without considering joint positions.

CR-CO Discrepancy

It is generally agreed that a difference exists between the occlusion dictated condylar position (CO) and the orthopedic stable joint position (CR). According to Roth, the clinically acceptable difference between CR and MI in terms of condylar position as measured by Condylar Position Indicator (CPI) is approximately 1 mm anteroposteriorly, 1 mm vertically and 0.5 mm transversely. Discrepancies greater than these values may possibly contribute to the development of TMD.

Hoffman, Silverman, and Garfinke used a modified articulator to measure differences in condyle position between centric relation (CR) and centric occlusion (CO) in anteroposterior (A-P), superoinferior (S-I), and mediolateral (M-L) dimensions. They found that CR does not coincide with CO in the majority of cases.

Girardot found larger horizontal and vertical condylar displacements in dolichofacial (open-bite) skeletal patterns than in brachyfacial (deep bite) skeletal patterns. The vertical component of the condylar displacement was result of posterior premature occlusal contacts.

Thomas W. Utt used MPI to compare CR and CO in 107 patients to determine magnitude, frequency and direction of this difference. He concluded that range of displacement between superior-inferior or antero-posterior is at least 2 mm on both sides and transverse shift of 0.5 mm or greater. The direction of the condylar displacement found in more recent condylar position instrumentation studies by Wood and Elliott, Shildkraut’s and Wood, has been most commonly posterior-inferior, next-most commonly anterior-inferior, and least commonly straight inferior. These findings support the concept of vertical condylar displacement as a result of posterior premature occlusal contacts.

Cordray did a prospective study to statistically evaluate the 3-dimensional nature of dental interarch displacement and condylar displacement between the SCP/CR and maximum intercuspation or centric occlusion (MIC/CO). Measurements were done by condylar position instrumentation, and evaluated for frequency, direction, and magnitude of displacement. The most prevalent types of directional change in condylar position were inferior (down) (97.0%) and distal (posterior) (66.7%) when the teeth were brought into MIC/CO. The mean difference in condylar position between the SCP/CR and MIC/CO was 0.86 mm in the horizontal plane, 1.80 mm in the vertical plane, and 0.26 mm in the transverse plane.
Earlier studies have shown MI-CR vertical discrepancies measured by the MPI or CPI instrument to be between 0.7 to 0.8 mm, horizontal discrepancies to be approximately 0.6 to 0.7 mm, and transverse discrepancies to be approximately 0.27 to 0.3 mm. However Crawford \( ^1 \) defined a problematic clinical discrepancy as larger than 1.0 mm (horizontal and vertical) and 0.5 mm transverse and Utt et al \( ^4 \) defined 2.0 mm (horizontal and vertical) and 0.5 mm transverse as the outer boundaries.

**Methods of Evaluating CR:**

A variety of different clinical techniques are being used to obtain centric jaw relation record. The anterior jig developed by Lucia and the leaf gauge introduced by Long are interocclusal deprogramming appliances used prior to registering CR. They were designed to diminish proprioceptive activity, promote muscular relaxation, and as a result, facilitate jaw manipulation. These instruments are classified as short-term deprogrammers \( ^12 \).

Dawson \( ^12 \) used a method of bilateral manipulation wherein the mandible is guided superiorly while operator applies downward pressure with the thumb to seat the condyle in the most superior position. However excessive pressure could result in reflex contraction of the masticatory muscles thereby making this method technique sensitive.

In this regard, Roth's \( ^13,14 \) power centric bite registration has the benefit of both hand manipulation and an anterior stop to seat the condyle in the most superior position using patients own musculature.

**Splint Therapy for TMD:**

Splint therapy has proven to be the most effective technique for deprogramming the neuromusculature and alleviating the signs and symptoms of TMD. Studies \( ^17,18 \) have shown that a properly conducted splint therapy and/or neuromuscular deprogramming reveals previously undetected contacts as a result of masticatory muscle relaxation and subsequent mandibular repositioning. The most reliable deprogramming is achieved through full-time wear of a full-coverage upper stabilization splint constructed in the SCP/CR, especially in patients who present with signs and symptoms of TMJ dysfunction \( ^19,20 \). Stabilization splints are recommended for a period of 3 to 6 months in patients with TMD. It believed that splints normalize the neuromuscular pattern by deprogramming the muscle splinting, relaxing the musculature thereby eliminating the signs and symptom of TMD.

In 1987 Girardot \( ^15 \) stabilized 19 symptomatic subjects with full-time wear of a full-coverage upper stabilization splint until symptoms were relieved and tracked condylar position before and after splint therapy with CPI. It was concluded that decreasing the condylar displacement (seating the condyles with stabilization splint therapy) positively correlated with the relief of TMD.

Wahlund \( ^16 \) evaluated the effectiveness of a flat-plane occlusal stabilization splint, compared to a control splint consisting simply of palatal acrylic. The results showed that stabilization splints were highly effective for the treatment of TMD.

Occlusal splint therapy has been shown to be an effective treatment in the relief of symptoms associated with craniomandibular disorders. Kemper and Okeson also proved that it is an effective treatment modality for the relief of headache pain \( ^21,22 \).

**Clinical Implications:**

1. SCP/CR is a desirable treatment goal for reorganization of the occlusion. It is especially desirable in the following cases\(^5\):
   - When restoring posterior occlusal stability by occlusal adjustment or tooth restoration.
   - When treating mandibular dysfunction.
   - When restoring the dentition with multiunit restorations.
   - When treating patients with complete denture prosthetics.
   - When treating patients orthodontically.
   - When positioning the condyle during orthognathic surgery.

2. When occlusal correction is performed accurately, it is clear that the correction of both the occlusion and condylar position is remarkably stable.

Orthodontic cases should be compared to gnathologically restored cases, not to an untreated population.
Since an increase of condylar displacement (CPI value) from 1 to 2 mm was shown to aggravate symptoms of TMD dramatically, it may be in the patient’s best interest for the clinician to reduce or minimize the pretreatment condylar displacement as much as possible.

**Conclusion**

The role of occlusion in the development of TMD remains a controversy. However, this literature review reports that although TMD is multifactorial, occlusion and occlusal factors play a pivotal role as predisposing factors. Nevertheless splint therapy have been found to be beneficial in treating patients with TMD. Therefore, orthodontic treatment should aim at treating patients to an orthopedically stable joint position wherein the stable intercuspal position of teeth is in harmony with the musculo-skeletally stable position of the condyles in the fossa.

**Ethical Clearance** – Not needed as it is Review article

**Source of Funding** – Nil

**Conflict of Interest** – Nil

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Composite Resin Twin Blocks for Correction of Angle’s Class II Malocclusion

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Abstract

Functional appliances and technique evolved during the 20th century from the early night time appliances to increased day time wear, and finally to full time wear with the Twin Block. Scientific evidence is now available from improved techniques to investigate growth modification in functional therapy, and the potential of functional forces to modify bone growth. A new paradigm for successful treatment presents a philosophical challenge to combine the benefits of orthodontic and orthopedic techniques and to extend our horizons in the treatment of malocclusion that requires dental and skeletal correction.

Twin Block appliances are simple bite blocks that are designed for full-time wear.

Keywords: Twin block, Malocclusion, Temporomandibular, Cephalometrics

Introduction

Skeletal class II malocclusions are commonly seen to be caused due to a retrognathic and/or retro-positioned lower jaw.¹ The Twin block appliance (TBA) was introduced by W.Clark in 1977. Due to increased compliance, efficacy and the advantages over other functional appliances became the appliance of choice in correcting such defects.² Despite this, the compliance rate with twin block appliance is still not as good as compared to Fixed functional appliances (FFA).³

Fixed Twin Blocks are pre-formed occlusal blocks with inclined planes, designed to fit over the occlusal surfaces of the upper and lower posterior teeth. Heat cured acrylic resins are the most popular material for fabrication of these twin blocks. They are cemented using Glass Ionomer cements. This article discusses the innovative use of Composite Resins used in Restorative Dentistry, for the fabrication of Fixed Twin blocks. The advantages and ease of fabrication of these composite twin blocks are discussed with a case report.

Case History

An 11 year old patient reported with chief complaint of an unpleasant profile and smile.

Photographs (Fig.1), radiographs and dental impressions were taken at his first visit. A VTO was taken which was followed by a consultation with a detailed explanation a week later.(Fig.1 & 2)

Clinical examination revealed a convex profile with deep mentalabial sulcus, incompetent lips, obtuse nasolabial angle and retruded chin. No gross facial asymmetry was observed. The patient was seen to have...
growth remaining according to the evaluation of cervical maturation staging of CVMI stage 4 which indicated the commencement of growth spurt within the years. Occlusion observation showed a Class II malocclusion (Right: Class II, Left: Class II) with deep overbite of 5mm and overjet of 8mm. The maxillary and mandibular dental midlines were coincident accompanied by the deviation of the maxillary midline from the facial midline.

Space analysis revealed tendency for mild crowding in lower dentition with a constriction of the maxillary arch indicating the need for expansion. Periodontal problems and temporomandibular joint disorders were not found. Cephalometric values showed a Class II skeletal pattern with orthognathic maxilla and retrognathic mandible according to WIT’s appraisal, ANB, SNA and SNB values respectively. The patient had an average mandibular plane and with clockwise rotation of the occlusal and palatal plane. The lower anterior facial height was seen to be decreased with decreased mandibular base and average mandibular height. The labiolingual inclination of the maxillary incisors were seen to be increased. From the above clinical and cephalometric findings the patient was diagnosed with Skeletal Class II pattern with Class II division 1 malocclusion.

Treatment Plan

The treatment plan was drawn up as follows:

1. Phase I - Functional appliance therapy – Two step advancement with Twin block appliance

2. Phase II - Fixed appliance therapy Phase I of treatment involved the use of functional appliance (Clark Twin Block appliance) to reduce the overjet, achieve class I molar relationships and gain anchorage at the start of treatment to simplify the fixed appliance stage. Furthermore, there is the theoretical advantage of improving the patient’s profile by causing a small skeletal change. The design of the upper component of the twin block involved an acrylic baseplate which covers the palate and occlusal surfaces of the first molars and second premolars. There was an inclined plane at the end of the mesial end of the acrylic block. A labial bow was used for anterior retention of the appliance. A midline screw was also included. The lower component consisted of a lingual acrylic baseplate covering the edge of the lower incisors. Both blocks had Adams clasps on the first molars to provide posterior retention.

Bite registration was performed with advancement of 6mm and bite opening of 4mm following the rule of 10. Removable twin block was fabricated with labial component and expansion screw in the maxillary segment and a conventional lower component with the inclined planes of 70 degrees. This appliance was delivered to the patient who demonstrated improved profile on insertion. The patient was instructed on the use and maintenance of the appliance. In the subsequent review appointments patient displayed tendency for non-compliant behaviour with absence of the pterygoid response and general pristine state of the appliance. The patient and parents was counselled on the benefits and need for compliance that could halt the progress of treatment. After 3 months the decision was taken to cement the bite blocks with glass ionomer cement to enhance compliance and effectiveness of the treatment protocol. The patient reported 10 days after cementation of the appliance with positive signs. But the patient displayed repeated cemention failure of the cemented bite blocks. Acrylic blocks. This cemental failure was noted to happen due to poor mechanical undersurface of the acrylic blocks to enhance cementation strength. Also Glass ionomer cement produces chemical bonding on the enamel surface of natural teeth, such bonding of GIC is not possible on the acrylic surface of twin blocks.

So a decision was made to replace the acrylic bite blocks with Silorane composite (Filtek Silorane®) bite blocks. These resins are popular in Restorative dentistry for restoring dental cavities and defects. The bite blocks were fabricated intraorally with a direct technique in increments after etching the enamel with 37% phosphoric acid. Silorane composite was built in increments to prepare the upper and lower bite blocks, bilaterally and in synchrony. The lower bite blocks was built and cured with the composite. Diamond abrasives were used to precise the shape and establish 70 degrees of inclination. Later the upper bite blocks were built on upper occlusal surface. Before curing the composite resins shaped as upper blocks, the lower occlusal surface and the lower inclined plane surface of the bite blocks was reflected to uncured composite by making the patient bite in advanced mandibular
etation with bite opening. Petroleum Jelly was used as separating media between cured lower block resin and uncured upper block resin. With this reflected shapes on uncured composite, Ultra violed light was exposed and the blocks were cured. Later the cured blocks were trimmed out for flash excess and polished with abrasive discs and rubber cups.

Patient was reviewed every month and the trimming of the bite blocks was commenced (fig.2) after 8 months of treatment. Sequentially after commencement of trimming of the blocks, the natural permanent occlusion developed from Class II to Class I relation.

After 12 months of functional appliance therapy phase II fixed appliance therapy for retention was commenced.

The labial brackets (0.022” slot MBT prescription) were directly bonded to the maxillary and mandibular dentition. Alignment and levelling of the maxillary and mandibular start were started simultaneously with 0.014” Niti progressing to 0.016” Niti, 0.016x0.022 “Niti, 0.017x0.025” Niti , 0.017x 0.025”SS, 0.019x0.025” Niti and finally to 0.019x0.025” SS wire over the duration of 18 months.

The patient presented with a straight profile with Angles Class I occlusion and competent lips was restored (fig.3). A symmetric, harmonious relationship of the facial soft tissue and a pleasant profile was obtained after treatment. The skeletal and molar relationship were corrected and lip competence was also achieved. Significant improvements in the vertical facial proportions and occlusal function were noted. Occlusal records revealed well interdigitated and aligned dentition with Class I occlusion on both sides and a normal overjet.

Lateral cephalometric films showed proper labiobuccal angulation of the upper and lower incisors and correction of skeletal Class II pattern was corrected to Class I. Cephalometric tracings revealed that almost every value had been brought into the normal range.

![Figure 1: PRETREATMENT PHOTOGRAPHS](image-url)
Discussion

Functional treatment of Class II malocclusion is best initiated during or slightly after the pubertal growth spurt. Considering the occlusal development, this period correlates in most patients with the late mixed or early permanent dentition. Here, in this case, the patient was in the late mixed dentition and, thus, at an ideal age to start with the treatment.

In this case, the treatment objectives were achieved largely due to the good compliance by the patient after placement of the fixed twin block. The patient’s chief complaint was an unpleasant profile due to a retrognathic mandible. The overjet reduction, in this case, was achieved by the favorable growth of mandible with the forward movement of lower incisors.

Thus by reducing the overjet with the functional appliance, the patient’s confidence improved.

The positive outcome at the end of treatment is due to the skeletal and dentoalveolar changes produced by the appliance. Post treatment the patient experienced an increase in the SNB angle by four degrees, from 74 degrees to 78 degrees (Table.1); this was most likely a result of increased mandibular growth. Ideally all functional appliances for Class II correction including twin-block are constructed from bite registrations. This is taken while the mandible is postured in a forward and downward position. The rationale for this clinical procedure is that favorable mandibular growth changes occur after mandibular displacement. The changes mainly involve the mandibular condyle, which shows additional growth in a superoposterior direction, with an increased bone apposition at the posterior aspects of
The advantages of twin block include simple and aesthetic appliance design, reduced chairside time and comfortable wear of the appliance. Major favorable effects induced by twin block therapy after the pubertal growth spurt compared to earlier phases are greater skeletal contribution to the correction of the molar relation, larger and clinically significant increments in total mandibular length. More posterior direction of condylar growth, a biological mechanism which enhances supplementary mandibular lengthening and reduces the amount of forward condylar displacement in favor of effective mandibular growth and reshaping.

The choice of the material for fabrication of the bite blocks was Silorane which is composed of Siloxanes and Oxirans; as this product class aims to have lower shrinkage, longer resistance to fading and less marginal discolouration. The silorane monomer ring differs obviously from the chain-monomers of hybrid composites. The hydrophobic properties of the material are caused by siloxanes. Exogenous discoloration and water absorption are reduced. The oxirane rings are responsible for the physical properties and the low shrinkage.

Siloranes are polymerized by a cationic reaction in contrast to methacrylates, which crosslink via radicals. A comprehensive study of Filtek Silorane® was carried out by Weinmann et al. (2005)[10]: It confirms the low shrinkage (< 1%) and found that the light stability of the silorane was seven times longer than for methacrylates. The siloranes low shrinkage leads to a lower contraction stress (Ernst et al. 2004[11], Bouillaguet et al. 2006[12]).

Ilie et al. 2007[13]). The silorane-based filling material was shown to have both low water absorption and water solubility (Palin et al. 2005[14]). Dentists both value and recognise the challenge of the relatively high viscosity.

Moreover Composite twinblocks demonstrate good bonding created over acide etched enamel surface primed by bonding agents. Such bond strength is impossible to achieve with cements and acrylic bite blocks. Loose bite blocks, delays functional therapy and produces inefficient results. Also loose bite blocks has a risk of aspiration or swallowing by the patient.

The feel of composite resin blocks and occlusal force transmission via these blocks, mimics so much as natural dentition, when compared to acrylic blocks.

Intra oral trimming of the blocks is very comfortable and precise with diamond burs supported with water coolant sprays, Trimming Acrylic with diamond burs is fussy as acrylic flakes on trimming.

Also there is no need for lab support in fabricating composite twin blocks as required for fabricating Acrylic Twin Blocks.

Thus, the placement of the fixed composite bite blocks aided in the compliance of the patient during the course of the treatment and ease of repair and trimming when required at the various stages of the treatment without derailing the treatment course usually caused due to breakage and loss of the appliance.

There was a marked comfort and efficiency in the overall treatment for the Orthodontist and the patient in the overall treatment stages with Twin Blocks built with composite blocks as compared to twin blocks fabricated with Acrylics.

**Ethical Clearance** – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/TN/2015)

**Source of Funding** – Nil

**Conflict of Interest** – Nil

**References**


A Novel Classification Method for Midpalatal Suture
Morphology In Indian Population- A CBCT Study

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Abstract

The aim of this present study is to classify midpalatal suture morphology in Indian population by CBCT images. MATERIAL AND METHODS :CBCT scan for 40 subjects in the age group of 8 to 25 years were taken for the study. Cross sectional image analysis in axial plane using CBCT was performed and radiographic stages of midpalatal suture maturation were assessed for the above age group of 8-25 yrs, as described in the study by Angeleri et al (AJODO 2013) into stage A/B/C/D/E. RESULTS: Stage A and B typically were observed up to 13 years of age, whereas stage C was noted primarily from 11 to 14 years. Fusion of the palatine (stage D) and maxillary (stage E) regions of the midpalatal suture was completed after 14 years . CONCLUSION: This new non-invasive method of classification might provide reliable parameters for the clinical decision between conventional and surgically assisted RME for adolescent and young adult patients.

Key Words: Mid Palatal Suture, Palate, Sutural Ossification

Introduction

Expansion of maxillary arch was introduced by Angell in orthodontics over 150 years ago. Opening of mid palatal suture through slow or rapid expansion appliances was advocated by many authors for correction of transverse discrepancies like the posterior crossbites and for coordination of the maxillary and mandibular dental arches prior to orthopedic or functional treatment of Class II and Class III malocclusions ¹⁻⁷. The effectiveness of skeletal and dental movement depends on the rate of expansion, the age of the patient, the amount of force applied, and the appliance type.⁸⁻¹² However, details of the morphology and the maturation of the midpalatal suture have been investigated only in histologic studies, occlusal radiographs and an animal study with multislice computed tomography.¹³⁻¹⁶

There are conflicting views about the closure of midpalatal suture as a reliable indicator of skeletal maturation. Chronological age is no longer an indicator for a real morphological status of the midpalatal suture closure. According to Persson and Thilander earliest obliteration can be seen in the posterior palate of a 15-year-old girl and there may be no obliteration at all in a 27-year-old female. Earliest obliteration in male was found in 21 years and no obliteration at all in a 32-year-old male.¹⁷

Many research studies have promoted the use of the computed tomography for the diagnostic procedure like localization of impacted teeth, amount of root resorption, study of cleft palate, site planning for orthodontic implants, diagnosis of deformities of face and jaws, bone regeneration, evaluation of ossification of different craniofacial sutures, the position of the condyle in the glenoid fossa of the temporomandibular joint, etc.¹⁸⁻²³

Therefore we studied the midpalatal suture morphology in Indian population and classified them according to their maturational stages by CBCT images.

Material and Method

CBCT scan for 40 subjects in the age group of 8 to 25 years were taken for the study. Radiographic stages of midpalatal suture maturation were assessed for the above age group of 8-25 yrs, as described in the study by Angeleri et al (AJODO 2013)²⁴.CBCT equipment used in this study is Kodak 9500. The settings were 90 kVp; 10 mA; field of view 18x21cm; exposure time 15 seconds with a spatial resolution of 10 line pairs per
centimeter and an isotropic 0.2-mm voxel size was used. The institutional review board of Bharath University reviewed and approved the study. Informed consents were obtained from all patients or their parents or guardians.

CareStream3D Imaging software was used to assess the mid palatal suture maturation stage. Each subject was seated in an upright position with the Frankfort horizontal plane (superior aspect of the external auditory canal to infraorbital rim line) parallel to the ground during the scanning process. In the sagittal view, the patient’s head was adjusted so that the anteroposterior long axis of the palate was horizontal. Cross sectional image analysis in axial plane using CBCT were performed and following steps were executed for defining the maturational stages of the midpalatal suture.

Stage A, the midpalatal suture is almost a straight high-density sutural line with no or little interdigititation(Fig 1).

Stage B, the midpalatal suture assumes an irregular shape and appears as a scalloped high-density line.(Fig 2) Stage C, the midpalatal suture appears as 2 parallel, scalloped, high-density lines that are close to each other, separated by small low-density spaces in the maxillary and palatine bones (between the incisive foramen and the palatino-maxillary suture and posterior to the palatino-maxillary suture). The suture can appear either in a straight or an irregular pattern(Fig 3).

Stage D, the fusion of the midpalatal suture has occurred in the palatine bone, with maturation progressing from posterior to anterior. The suture still can be seen as 2 high density lines separated by small low-density spaces.(Fig 4)

Stage E, fusion of the midpalatal suture has occurred in the maxilla. The actual suture is not visible in at least a portion of the maxilla. The bone density is the same as in other regions of the palate.(Fig 5)

**Results**

The maturational stages of the midpalatal suture observed in the sample are shown in Table 1.

<table>
<thead>
<tr>
<th>Stage</th>
<th>8-11 Yrs</th>
<th>11-14 Yrs</th>
<th>14-18 Yrs</th>
<th>18-25 Yrs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>9</td>
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<tr>
<td>D</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>E</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>40</td>
</tr>
</tbody>
</table>
Stage A was noted in the early childhood period from 8 to almost 10 years of age. Stage B was present mainly up to 13 years of age in 6 of 10 subjects (4 boys, 2 girls). Stage C was observed mainly from 11 to 15 years of age (6 boys and 3 girls). However, one 11-year-old girl was in stage C. No subject from 5 to almost 11 years of age had fusion of the midpalatal suture.

From 11 to almost 14 years of age, 4 of 7 girls and 1 of 6 boys had fusion of the midpalatal suture in palatine bone. For subjects between 14 and 18 years of age, 1 of 3 girls and all the 4 boys had fusion of the midpalatal suture in palatine (stage D) bone. 5 of 6 girls and 3 of 4 boys in 18-25 group had fusion of maxillary bone (stage E).

**Discussion**

The midpalatal suture has been described as an end-to-end type of suture with characteristic changes in its morphology during growth. The sutures of the skull have been convincingly demonstrated to be sites of skeletal growth. Several well-documented studies have shown that the application of controlled mechanical forces during the skeletal growth period will affect the craniofacial growth through remodeling changes in sutural articulations. With advancing age, however, sutures are normally obliterated by calcified tissue.

Chronologic age is unreliable for determining the developmental status of the suture during growth, as evidenced by our study, in which subjects older than 11 years presented at all stages of midpalatal suture maturation. According to our study sutural ossification proceeds from posterior to anterior region and there is increased sutural activity with increase in age.

The progress in the ossification in the anterior part of the suture is irregular with advancement in the skeletal maturity as reported by Revelo and Fishman. Ossification also increased in the posterior part of the suture. Our finding was also in accordance with the Melsen who also reported that there is greater sutural activity during the period of pubertal growth spurt.

Persson and Thilander gave the explanation for this in their histological study on human autopsy specimens. They studied the extent of ossification in oronasal section of the intermaxillary suture in subjects with the age group of 15 to 35 years. They found the degree of obliteration was more posteriorly than anteriorly. They have also quoted Davida who reported that midpalatal suture in human skull starts to close posteriorly without exception. It showed greater degree of obliteration posteriorly than anteriorly. Ossification occurred very late anterior to incisive foramen. They have also speculated that the midpalatal sutures obliteration indexes indicate that there is a greater activity in the sutural closure of the palate between 20 and 25 years of age and when the fusion index is below 5% it could be expanded using conventional RME orthopedic forces.

Bacetti has reported that the effects of maxillary separation by means of the Haas expander appear to reach anatomical skeletal regions far from the midpalatal suture only when treatment is delivered before the peak in skeletal growth velocity. Wertz stated that with increased age the fulcrum of maxillary separation tends to be displaced more inferiorly, nearer to the activating force. In children, the fulcrum may be as high as the frontomaxillary suture whereas in adolescents the fulcrum is much lower. These differential, age-dependent effects may be attributed to the increased resistance to maxillary separation by the circummaxillary structures because of increased calcification in the sutural skeletal structures. Thus our study was conducted to assess the exact amount of ossification seen at each stage.

As reported by Angelieri, at stages A and B a conventional RME approach would have less resistant forces and probably more skeletal effects than at stage C, when there are many initial ossification areas along the midpalatal suture. Initial diagnosis of stage C might indicate that the timing of RME is critical because the start of fusion of the palatine portion of the suture could be imminent. Patients in stage D and E can be better treated by surgically assisted RME because fusion of the midpalatal suture already has occurred partially or totally, hampering the RME forces from opening the suture. Thus the exact amount of ossification and the site of ossification will help the orthodontists and the oral and maxillofacial surgeons to plan the exact the site for the midline cortical osteotomy.

**Conclusion**

The findings of this study could elucidate the diagnostic stage of sutural maturation, which also helps in assessing the surgically assisted RME that increases morbidity and treatment costs. This new non-invasive method of classification might provide
reliable parameters for the clinical decision between conventional and surgically assisted RME for adolescent and young adult patients.

**Ethical Clearance** – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/TN/2015)

**Source of Funding** – Nil

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Evaluation of Temporomandibular Disk Position in Symptomatic Temporomandibular Disorder Patients with Gnathological Splint Therapy Using MRI

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Abstract

Objective: The aim of this study was to Evaluation of altered temporomandibular disc position in symptomatic TMD patients with pre and post gnathological splint therapy.

Materials and Method: This study included ten patients with a mean age of 21.5 years with maxillary transverse deficiency treated with the skeletal expander. The study consisted of 15 patients with a mean age of 25 years with clinically symptomatic and orthodontically untreated TMD patients with splint therapy. Statistical analysis was performed using paired t-test. Results: The mean AS, SS, and PS values for right TMJ that was 0.2mm (SD ±0.6mm), 0.5mm(SD± 0.3mm), 0.4mm(SD±0.1mm), respectively and the mean difference between AS, SS, and PS values for left TMJ was 0.2mm (SD±0.1mm), 0.5mm (SD ± 0.05mm), and 0.2mm (SD± 0.2mm). The ratio of AS to SS to PS was 0.2to 0.5to 0.4. No significant sex difference was noted in joint space distances. The results showed less variability of condylar position in the fossa than in normal subjects.

Conclusion: Gnathological splints can be used as effectiveness mean for treatment of such patients. This can be easy made good comfort to the patients.

Keywords: TMJ, splint, MRI, Joint space.

Introduction

The temporomandibular joint (TMJ) is a compound articulation of the articular surfaces of the temporal bone and the mandibular condyle¹. The TMJ functions uniquely in that the condyle both rotates within the fossa and translates anteriorly along the articular eminence. The condyle’s ability to translate the mandible can have a much higher maximal Incisal opening than would be possible with rotation alone. The joint is thus referred to as “Ginglymodiarthrodial.”² a combination of the terms Ginglymoid (rotation) and Arthroidal (translation). TMD is a prevalent disorder most commonly observed in individuals between the ages of 20 years to 40 years. Approximately 33% of the population has at least one TMD symptom and 3.6-7% of the population has TMD with sufficient severity to cause them to seek treatment³. The etiology of TMJ disorders remains unclear, but it is likely multifactorial. Capsule inflammation or damage and muscle pain or spasm may be caused by abnormal occlusion, parafunctional habits (e.g., bruxism , teeth clenching, lip biting), stress, anxiety, or abnormalities of the intra-articular disk. Treatment of TMJ disorders are varied. But dental occlusal splinting and permanent occlusal adjustment have been the mainstays of TMJ disorder treatment. Occlusal splint therapy may be defined as “the art and science of establishing neuromuscular harmony in the masticatory system by creating a mechanical disadvantage for parafunctional forces with
removable appliances. Conventional tomographic x-rays are commonly used to view the temporomandibular joint area. However, because of poor quality of images and variability in interpretation of anatomic areas, it failed to provide necessary information for diagnosing optimal condylar position. Magnetic resonance imaging (MRI) is a non-invasive, non-ionizing procedure that produces highly sensitive and specific tomographic images in any plane with excellent soft tissue contrast and reduced biologic hazards. Magnetic resonance imaging (MRI) has become the gold standard for examination of soft tissues of the TMJ. The purpose of the study was to evaluate joint spaces before and after splint therapy by MRI.

**Materials and Method**

The sample for the study was recruited from the patients who reported to the Department of Orthodontics at Sree Balaji Dental College and Hospital. Ethical approval was obtained from the Institutional Review Board and informed written consent was obtained from all the participants. The sample consists of fifteen patients within the age group of 22–30.

**Inclusion Criteria:** Clicking sound in TMJ area, Tenderness of muscles of mastication, Deviation of the lower jaw on opening, Unilateral or bilateral headaches, shoulder pain and/or neck pain, Generalised attrition/mobility of teeth.

**Exclusion Criteria:** Developmental anomalies, Degenerative disc conditions, Orthodontically treated patients.

**Splint fabrication:**

The study was initiated with Maxillary and mandibular impression which were taken using an irreversible hydrocolloid in sterilized metal rim-lock trays and poured with Type 4 Gypsum, facebow transfer, Roth’s power centric bite registration, centric occlusion bite registration, articulation, CO-CR discrepancy. After assessing the CO-CR discrepancy splint was fabricated and delivered. Face-bow transfer records were taken using the Axioquick Expansion Kit AX, (SAM Prazisionstechnik GmbH, Fussbergstr 1, Germany). It records the relationship of the maxilla to the cranial base.

Figure 1: Face bow transfer (a) frontal view (b) profile view

The wax bite recorded in patient’s initial CR, which should not be mistaken for terminal CR. It is difficult to capture one’s true CR at chair-side during initial visit. A true CR can be registered only after the stabilization of condylar position. Centric relation bite (Roth power centric) was taken with Delar bite registration wax in two sections, one in the anterior region and the other in the posterior region. The patient was seated in the dental chair reclined at an angle of 45° to the floor. To take the anterior section, the wax (2–3 layer thickness) was cut in a shape and appropriate size to register from canine to canine. The wax was then heated until soft in a water bath at 138°F. The wax bite was then placed in the patient’s mouth extending from canine to canine. The patient’s mandible was then manipulated (to CR) to make an interocclusal registration in the anterior section. The patient was then instructed to close until the posterior teeth were discluded approximately 3 mm in the area of the second molars. While in the closed position, an air syringe was used to begin the cooling process. The anterior record was then removed, and stored in chilled water. The posterior section was trimmed wide enough to include the last molar extended across the arch. The wax was then softened and placed on the maxillary posterior teeth. With the posterior section in place, the chilled anterior portion was placed back in position again. The patient was then guided in the same manner to close into the hardened anterior segment and asked to bite as firmly as possible and hold it. This allowed the patient’s musculature to aid in seating the condyle in CR position. Both the bites were then removed and stored in chilled water.

With the help of face-bow transfer record, the maxillary model is mounted to the articulator with the mounting plate and mounting plaster. Sufficient time is allowed for the plaster to set. The incisal guide pin is raised by 3 mm. To mount the lower model, the articulator is inverted, the centric wax bites are placed on the maxillary model, and the mandibular model is placed into the wax. A mounting plate is fastened to the lower
The splint was fabricated on an articulator. Upon closure of the arches, there were simultaneous centric stops with mandibular buccal cusp. Clearance of 0.005” was provided for the anterior teeth. Splint was fabricated with cold cure acrylic resin at a position with 3 mm clearance from the fulcrum. The splint was then allowed to set for sufficient time. With the splint still not removed from the articulator, initial trimming was done to establish centric stops and mutually protected functional occlusal pattern. The splint later was adjusted in the patient’s mouth to do further trimming to establish the same [Figure 2]. The patient was advised to wear the splint full time.

**Measurements:** The condylar joint spaces before and after 6 months of gnathological splint therapy was assessed by MRI.
Table 2: (Left joint space values)

<table>
<thead>
<tr>
<th>Patient No</th>
<th>Pre – Anterior Space</th>
<th>Post – Anterior Space</th>
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Table 3: (Right joint space mean values)

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Table 4: (Left joint space mean values)

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Statistical Analysis

(If P-Value is <0.05 then statistically significant)

The Normality tests Kolmogorov-Smirnov and Shapiro-Wilks tests results reveal that the variables (Vertical and Horizontal distances) follow Normal distribution. Therefore to analyse the data parametric methods are applied. To compare the mean PAIRED SAMPLE t-test were used for each measurement to evaluate the average differences between the right and left side of the each sample. To analyse the data SPSS (IBM SPSS Statistics for Windows, Version 22.0, Armonk, NY: IBM Corp. Released 2013) is used. Significance level is fixed as 5% (p= 0.05)

Result

Table 1 and 2 shows the pre and post treatment outcomes of mean value of 15 patients in terms of change in the Anterior, Superior, Posterior joint space (AS, SS and PS) (Measured in mm) in the right and left side joint respectively.

Table 3 and 4 shows the mean difference between AS, SS, and PS values of pre and post-treatment for right TMJ that was 0.2mm (SD ±0.6mm; p-value 0.002), 0.5mm(SD± 0.3mm; p-value 0.001), 0.4mm(SD±0.1mm; p- value 0.005), respectively and the mean difference between AS, SS, and PS values of pre and post-treatment for left TMJ was 0.2mm (SD±0.1mm; p- value 0.001), 0.5mm (SD± 0.05mm; p- value 0.001), and 0.2mm (SD±0.2mm; p- value 0.004), respectively.

The result of this study hence showed that there was statistical significant difference in the all anterior, superior, and posterior space both in the right and left side joint pre and post treatment and the values of post treatment approached the mean values reported by Kazumi et al.

Discussion

Some TMD patients awake with TMD pain that only last m minutes to hours, suggesting that nocturnal factors are the primary contributors to these symptoms. In this third patient group, patients generally report that either their awaking or daytime symptoms are worse, suggesting that the nocturnal or diurnal factors are more significantly contributing to their symptoms. Therefore it’s best that the splint is worn 24 hours a day for best effective treatment and so full time wear of gnathological splint was advocated in this study. Roth power centric bite registrations anatomically seat the condyles in anterior superior position within the fossa.

It has been reported that clinical examination for the diagnosis of anterior disc displacement with reduction has an accuracy of 43–75%. This suggests that a clinical examination should be done together with other imaging methods in order to determine the relationship between the articular disc and condyle. In recent years, magnetic resonance imaging (MRI) has been used because it is an effective, noninvasive method that does not appear to cause any biological hazard.

The goal of our study was to check the condylar disc position, joint space in pre and post gnathological splint therapy for six months using MRI in patient with TMD problems. Subject were patients who had an anterior disc displacement with reduction before treatment. Our study was designed to identify the condylar disc position, joint space.

Kazumi et al (2009) in his study on optimal condylar position in the fossa on sagittal CBCT images in functionally optimal joints without displacement reported that mean AS,SS, & PS values are 1.3mm(SD±0.2mm),2.5mm(SD±0.5mm) and2.1mm(SD±0.3mm), respectively. The ratio of AS to SS to PS was 1.0 to 1.9 to 1.6. In our present short term study the patients are symptomatic of TMD and post treatment results were taken after six months. In my study using MRI, the post treatment values approximate the results provided by Kazumi et al.

All the symptomatic patients who were selected in this study exhibited resolution of symptoms such as pain located around the TMJ , pain that was referred to the neck , head and ear and pain that was located immediately in front of the tragus of the ear, projecting to the ear, cheek, and along the mandible. The restricted jaw motion was also resolved in all of the study patients but joint noise such as clicks and crepitus resolved only for a little more than 60% of the patients in the span of just four weeks of total six months.

Conclusion & Summary

TMD should be treated like any other musculoskeletal complaints. If TMD is left untreated, symptoms can be worsen and extend far beyond the jaw and the mouth area. Gnathological splints can be used as effectiveness
mean for treatment of such patients. This can be easy made good comfort to the patients.

Amount of change in the right side TMJ

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Amount of change in the left side of TMJ

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Relief of pain and other symptoms

MRI supported our clinical results with great specificity.

Conflict of Interest: NIL

Source of Funding: Self-funding


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1. JB costen; A syndrome of ear and sinus symptoms dependent upon disturbed function of the temporomandibular joint March 1934, Ann Otol Laryngol VOl 43, No 1, pages 1-15

2. Herb K choS, Stiles MA. Temporomandibular joint pain and dysfunction; Cure pain headache Rep.2006;10:408-14


Oral Manifestations in Association with Chronic Renal Failure Patients - A Clinical Study

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Abstract

Aims and objectives: The aim of this study is to analyze the oral manifestations in Chronic renal failure patients, to assess the incidence of oral manifestations among male and female patients and to rank the commonly occurring oral manifestations in such patients.

Materials and method: The study was conducted by selecting patients suffering from chronic renal failure. The study group consist of 100 chronic renal failure patients. Patients between the age group 13 – 75 years were taken into the study. Patients with other systemic conditions like diabetes mellitus and hypertension were included in the study. Childrens upto 13 years of age were excluded in the study.

Result: Out of 100 patients, 66 patients were males and 34 patients were females. 15% of patients presented with halitosis. 14% of patients with xerostomia. 13% of patients with periodontitis. 10% of patients with leukoplakia. 9% of patients with depapillation. 7% of patients with gingival enlargement. 6% of patients with bad taste. 5% of patients with candidiasis and 2% of patients with central papillary atrophy of tongue.

Conclusion: In the study, drug associated oral manifestations like xerostomia, bad taste, gingival hyperplasia were found and other conditions such as halitosis periodontitis, leukoplakia, depapillation, candidiasis, central papillary atrophy of tongue were also found which may be related to immunosuppression.

Key words: Chronic renal failure, leukoplakia, candidiasis, periodontitis.

Introduction

Chronic renal failure is permanent loss in renal function or kidney injury over a period of months or years and it has become a public health problem. It is defined as a progressive decline in renal function associated with a reduced glomerular filtration rate. The terminal stage of this disease has serious health outcomes which carry high economical and social costs, requiring dialysis and renal transplantation in order to improve the quality of life. The most common causes are diabetes mellitus, glomerulonephritis and chronic hypertension. In older individuals, the most common causes are renovascular disease and diabetes mellitus, although other causes include polycystic kidney disease and pyelonephritis. Most of the affected people are not aware of the disease at an early stage because they are asymptomatic. Some symptoms of the disease include feeling generally unwell, swelling of hands, legs or feet and blood in urine.

The incidence and prevalence of patients with chronic renal failure (CRF) is increasing worldwide. The prevalence range in India was found to be 0.86% with Chennai and 0.79% with delhi. In Bhopal among 572,029 patients the average incidence was found to be 151 and 232 per million population respectively. The reported incidence of CRF is 337, 90, 107 and 95 per million population (pmp) in USA, Australia, New
Zealand and UK respectively\(^5\). The prevalence has been growing by 6.8% annually during the past 5yrs. The incidence rate is increased from 33.3 patients per million people in 1993 to 167.8 pmp in 2005 in Brazil\(^6\).

The disease can give rise to wide spectrum of oral manifestations, affecting the hard and soft tissues of the mouth and individuals with such disease will probably continue to require oral health care\(^3\). This study was done to analyze the oral manifestations in CRF patients. To assess the incidence of oral manifestations among male and female patients and to rank the commonly occurring oral manifestations in such patients.

**Materials and method**

Our study consists of 100 CRF patients. Both males and females were included in the study. Patients between the age group 13-75years were included in the study. Patients with other systemic conditions like diabetes mellitus and hypertension were included in the study. Childrens upto 13years of age were excluded in the study.

Intra oral examination was done for those patients to diagnose the oral manifestations. Patients were examined clinically using a mouth mirror, william’s periodontal probe to check the periodontal pockets and further examination for mucosal changes was also carried out. The incidence of oral manifestations among male and female patients and the commonly occurring oral manifestations were observed in the study.

**Discussion**

The incidence of chronic renal failure (CRF) continues to rise worldwide and, as a consequence, increasing number of individuals with such disease will apparently require oral health care. Chronic renal failure and its treatment have systemic and oral manifestations\(^1\).

The prevalence of oral lesions in renal failure patients increase with accompanying systemic diseases. For example diabetic patients have more oral manifestations compared with non-diabetic patients. According to Proctor R et al\(^1\) a variety of oral lesions including potentially malignant oral lesions and oral cancer have been found to be associated with chronic renal failure patients. So a clinical study was designed to find the oral manifestations associated with chronic renal failure patients. In recent years, the pattern of oral manifestations has been changed, primarily as a consequence of drug therapy and immunosuppressant drugs. The incidence of CRF increases with age, males are more commonly affected than females\(^1\).

In our study of 100 CRF patients 66% were males and 34% were females with respect to age and the highest frequency was between 40 – 60 years of age which correlates with the study done by proctor et al\(^1\).

**Periodontitis**

Periodontitis is one of the common clinical manifestation seen in chronic renal failure patients (Figure 1). Patients under renal dialysis are at high risk for developing periodontal disease. It is recommended that patients under treatment for renal failure should be examined periodically by dentist for oral health. Factors such as systemic diseases and usage of drugs play a major role in the development of periodontal disease\(^7\).

Patients receiving hemodialysis have been suggested to present a certain degree of immunosupression. Based on the finding by Ismail Marakoglu et al\(^7\) chronic renal failure does not seem to be an additional risk factor for more severe periodontal destruction and this was consistent with our study where only 13% of patients had periodontitis. Klassen J T, Krasko B M et al\(^8\) evaluated 45 chronic renal failure patients and reported 100% of them presented with some type of periodontal disease which does not correlate with our study.

**Xerostomia**

Xerostomia or dry mouth is the abnormal reduction of saliva and can be a symptom of certain diseases. Possible cause include restricted fluid intake, side effects of drug therapy and mouth breathing\(^1\).

Mosannen mozafai et al\(^9\) suggested that xerostomia is a common finding with prevalence of 73.2% in renal failure patients. Another study by Madiha Sanai et al\(^10\) also suggested that xerostomia is the most common oral finding in chronic renal failure patients. This is not in agreement with the present study where only 14% of patients had xerostomia.

**Candidiasis**

As a result of long term immunosuppression therapy, patient’s immune response is reduced which makes them more susceptible to develop infections. Fungal infections have the highest degree of mortality rate
despite its lower incidence compared to bacterial and viral infections. There is an increased prevalence of oral candidiasis and the causative agent is candida albicans\(^\text{(11)}\).

Hemodialysis could affect the oral micro flora. They found isolation of candida was more significant in patients on hemodialysis in comparison to healthy individual which might be due to the immunodeficiency in these patients\(^\text{(12)}\). In the present study among 100 patients only 5% of cases have been reported with candidiasis (Figure 2) and it does not correlate with the study conducted by Estela De La Rosa Garcia et al\(^\text{(13)}\) in a group of 99 patients of which 17.2% of cases expressed candidiasis.

**Gingival enlargement**

Gingival enlargement is also a common clinical manifestation seen in chronic renal failure patients (Figure 3). It appears within 1-3 months after initiation of treatment with the associated medications. According to Proctor et al\(^\text{(1)}\) gingival overgrowth normally begins at the interdental papillae and is most frequently found in the anterior segment of the labial surface. Gingival enlargement secondary to drug therapy is the most reported oral manifestation of renal disease. It can be induced either by cyclosporine and/or calcium channel blockers. It principally affects the labial interdental papillae, although it can become extensive, involving the gingival margins, lingual and palatal surfaces\(^\text{(1)}\). The main cause of gingival enlargement is cyclosporine and calcium channel blocker such as niphedipine. Gingival enlargement was more severe in patients taking both drugs\(^\text{(9)}\).

Mahnaz Sahebjamee et al\(^\text{(14)}\) in their study found the prevalence of gingival enlargement to be 7% which is consistent with our study showed 7% of cases characterized by firm nodular gingival overgrowth seen on both buccal and palatal aspects, which could be associated with usage of drugs during the treatment.

**Bad taste**

Bad taste is one of the early symptoms seen in chronic renal failure patients, which may be a metallic taste or unpleasant odor in the mouth particularly in the morning. Approximately 30% of patients with advanced chronic renal disease were reported to have a bad or a metallic taste in their mouth, which has been associated with metabolic changes, diverse drugs, a reduced number of taste buds and change in both salivary flow rate and composition\(^\text{(15)}\) which was not in agreement with our study where in only 6% of patients complained of bad taste in the oral cavity.

**Halitosis**

Halitosis is common and can affect people of all ages. The prevalence of persistent oral malodor in a recent Brazilian study was reported to be 15% which match with our study showing the prevalence of same 15% in Indian population\(^\text{(16)}\). The prevalence of oral malodor was three times more common in males than in females and the risk was slightly three times higher in people above 20 years of age compared with those aged 20 years or below. In our study 12 patients were males and 3 patients were females, the association between the presence of halitosis with respect to gender is coherent with the study conducted by Nadanovsky P et al\(^\text{(17)}\). Tessier JF et al\(^\text{(18)}\) estimated that more than 50% of the population has halitosis which differed with our study.

**Depapillation**

In the present study 9% of patients diagnosed with Depapillation of tongue (Figure 4). Out of which 5 patients were males and 4 patients were females. The association between the manifestation of Depapillation with respect to age show increased prevalence between 50-60years of age.

**Leukoplakia**

Before the era of dialysis, Leukoplakia and oral candidiasis were not uncommon in patients with advanced renal failure. The increased rate of Leukoplakia in renal failure patients was a consequence of their immunosuppression or drug therapy. The third most commonly diagnosed lesion was Leukoplakia with a prevalence of 10%\(^\text{(19)}\). This finding corresponds to our present study showing 10% of cases with Leukoplakia in the oral cavity (Figure 5).

**Central papillary atrophy of tongue**

Klassen J T and Krasko B Met al\(^\text{(8)}\) found 1% of central papillary atrophy of tongue cases among chronic renal failure patients (Figure 6). In our study 2% patients had central papillary atrophy of tongue which proves to be significant with the above statement.
Results

Among the 100 chronic renal failure patients in our study 66 patients were males and 34 patients were females (Table 1 and Graph 1). Minimum age of 13 years and maximum age of 73 years were observed in the study. Among the patients 21% were between the age group 1-30 years, 18% were between 30-40 years, 24% were between 40-50 years, 25% were between 50-60 years and 12% were above 60 years (Graph 2). In the present study 15% of patients presented with halitosis. 14% of patients with xerostomia. 13% of patients with periodontitis. 10% of patients with leukoplakia. 9% of patients with depapillation. 7% of patients with gingival enlargement. 6% of patients with bad taste. 5% of patients with candidiasis and 2% of patients with central papillary atrophy of tongue (Table 2 & Graph 3).

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Graph 1

Graph 2

Graph 3

Oral mucosal lesions seen during the study

Figure 1 – Periodontitis
The accomplishment of present study is to evaluate the oral manifestations associated with chronic renal failure patients. Drug associated oral manifestations like xerostomia, metallic taste, gingival enlargement were predicted in our study which highlights that those medications for renal failure are at high risk for these adverse effects. Other conditions such as halitosis, periodontitis, Leukoplakia, Depapillation, candidiasis, central papillary atrophy of tongue were also identified in our study which may be related to immunosuppression.

Further course of the study can be conducted by comparing the incidence of oral lesions between different categories of renal patients and with wider sample size which will give better conclusion to confirm that these
manifestations are solely due to renal failure and also aid in early institution of appropriate oral health care which could prevent the progression of these conditions which otherwise might culminate in loss of teeth and malignancies.

**Ethical Clearance** – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/ TN/2015).

**Source of Funding** – Nil

**Conflict of Interest** – Nil

**References**

Review Article

Transposition of Teeth and its Management in Orthodontics

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Abstract

Transposition refers to an interchange in the position of two adjacent teeth within the same quadrant of the dental arch. It can be either complete transposition wherein all the structures of the teeth are parallel in the transposed position or incomplete where this complete transfer of structures are not seen. Various theories and factors have been proposed to determine the etiology of transposition but it is found to be most of genetic origin. Transposition compromises the esthetic and functional abilities of a dentition.

Keywords: transposition, ectopic eruption, genetics

Introduction

Transposition was first reported in the 19th century. It was Harris in the year 1849, who described it as an aberration in the position of tooth in the first edition of his “A dictionary of dental sciences biography bibliography an medical terminology”¹. Since then it has been an alteration whose term has undergone continuous changes.

Transposition was initially defined as the positional interchange of two teeth within the same quadrant. It was Peck et al who defined transposition completely as a dental anomaly characterized by the exchange of position between two adjacent teeth, especially in relation to their roots, or the development and eruption of a tooth in a position normally occupied by a nonadjacent tooth².

Tooth transposition is frequently seen in association with other dental conditions like hypodontia, microdontia, rotated and malpositioned adjacent teeth, retained deciduous teeth, ankylosis, teeth with dilaceration of roots³⁻⁵.

Ectopic eruption is a large category wherein the teeth present an abnormal eruptive pathway, of which transposition may be considered as the extreme type. The other types include pseudo transpositions or incomplete, partial, simple, or coronal transpositions⁶⁻⁸.

Since transpositions compromise the esthetic and functional abilities of a dentition, it is important to have adequate knowledge of it. This review article throws light on the literature, prevalence, etiology, clinical management of transposition of teeth.

Prevalence

The prevalence of transposition in various countries have been studied. A rate of 0.38% was reported in Turkey⁹, 0.13% in Saudi Arabia¹⁰, 0.43% in an Indian population¹¹ and 0.14% in Nigeria¹². These studies were conducted in samples of dental patients. Prevalence rates in European studies were 0.03% among Swedish school children¹³, 0.25% in a sample of Scottish orthodontic patients¹⁴ and 0.09% among Greek dental patients. A study of composite African sample dental casts and a skeletal sample of Nubians found a prevalence rate of 0.51%.¹⁵ The great diversity observed may be attributed to limitations inherent with epidemiological studies.

An interesting correlation of transposition with Down’s syndrome and cleft lip was also observed in studies. The incidence of transposition in patients with
down’s syndrome was observed to be 14.29% (16). A correlation of 4.1% with atypical forms of transposition was found with cleft lip patients (17).

Transposition is seen both in the maxillary and mandibular arches and commonly occurs in maxillary arch. It has been reported both in males and females with a higher prevalence in females (18). It occurs more commonly as a unilateral condition though it can occur bilaterally also. The left side is more commonly involved than the right side (19) with no specific etiology.

The teeth commonly involved in transposition include the the canines, first premolar, lateral and central incisors. Among these the transposition between canine and first premolar is the most commonly occurring anomaly and the canines at the position of the central incisor being the rarest (20).

Bilateral transpositions are extremely rare and very few cases have been reported. A case of bilateral transposition of maxillary canine with central incisors which were missing has been reported by Jahangiri et al (21). In concern with the mandible the mandibular canine and lateral incisor are most commonly transposed (22). Commonly transpositions not involving the canines are very rare (23).

**Etiology**

The exact etiology for transposition is not clear yet. Hence multiple factors have been associated with them. These factors include:

- Exchange of tooth germs: according to this factor exchange of tooth buds or the dental lamina cells in the initial stages of development of teeth may cause transposition (24, 25).

- Pathology: pathologies like tumour and cyst were also associated as etiological factors for transposition (26).

- Retained deciduous canine: since transposition was most commonly accompanied with retained deciduous teeth, some authors suggested it as the main etiological factor for transposition (27, 28).

- Early loss of primary teeth, or even of permanent teeth: In a dental crypt if the primary teeth undergoes resorption late, the permanent successor does not acquire a proper position (29).

- Migration of the ectopic tooth: Since the maxillary canine is the most commonly transpositioned teeth the eruptive path of maxillary canine is discussed. The permanent canine starts developing at the age of 4-5 months, its crown is completed at 6-7 years of age, it erupts at the age of 11-12 years and its root formation is complete by the age of 13-15 years. In the maxilla, at 4.5 years of age, the permanent canine lies above the first premolar, which in turn, is above the primary first molar. The eruption path is often guided by root orientation, but it may change as the erupting tooth approaches another tooth. Space conditions in the jaws, mechanical obstacles and varying rates of development may affect and modify the direction of the erupting tooth. Slow eruption, in combination with the anatomical position of the canine crypt within the jaw, may contribute to the development of canine transposition (26-30).

In addition trauma to the primary teeth, intra osseous or bony migration of canines are also suggested as an etiology (31) however the present data associates this anomaly to genetic influences with multifactorial inheritance model.

- Heredity. The DNA associated with the dental development are also responsible for proper positioning of the teeth in the dental arch. The sequence of teeth to be positioned are also genetically determined and hence any change in the sequence that is transposition was also genetically correlated. Consequently, genetic regions causing transposition must exist as a result of aberrant gene function at this region. factors substantiating this theory include the variation of transposition in various races, the high correlation of transposition with other dental anomalies like peg laterals, congenitally missing teeth, bilateral occurrence, involvement of same tooth on both halves and numerous cases within the same family tree eruption path often guided by root orientation, but it may change as the erupting tooth approaches another tooth (32, 33).

Further, space conditions in the jaws, mechanical obstacles and varying rates of development may affect and modify the direction of the erupting tooth.

**Clinical Management:**

The mesiobuccal displacement of canine between the first and second premolar can be seen when there is transposition of canine and first premolar. Yh distal
tipping of the first premolar is frequently and seen displaced in a mesiopalatal direction. Moreover, the deciduous canine is often present, yielding a temporary space restriction.\(^{(36-38)}\)

Early diagnosis of a developing transposition is extremely important and has a great influence on prognosis. Conventional panoramic radiograph can be used if diagnosed early and interceptive procedures like removal of deciduous teeth and providing eruption guidance for the permanent teeth to erupt in its proper position., thus preventing complete development of the anomaly. On the other hand, when transposition is detected at a later stage, orthodontic planning must address the indications for and against extraction and the sequence of correcting tooth positioning\(^{(36-39)}\).

When transposition is more severe and affects the crown and root, the attempt to reposition affected teeth in the dental arch is complicated and may cause damage to the supporting tissues. Thus, alignment of these teeth in their transposed positions is usually required\(^{(36-39)}\).

The decision to extract a permanent tooth, usually the premolar, is more attractive when teeth affected by transposition present carries or poor periodontal support or when there is a severe tooth-size discrepancy. When the practitioner decides to reposition the transposed teeth, care should be taken during mechanical management to avoid occlusal interference and root resorption, as well as bone loss, especially of the buccal bone plate.\(^{(36-39)}\)

Thus, the palatally displaced premolar should be initially moved to allow free movement of canine on the buccal aspect to its normal position. After repositioning of the canine, the premolar may be corrected. The disadvantage of this approach is the time required for correction, which will be compensated by the esthetic and functional outcome.\(^{(36-39)}\)

The clinical management can be summarized as

Interceptive treatment, if the transposition is detected earlier in life within 6–8 yrs\(^{(36)}\), the transposed tooth can be guided to the normal location by extracting the deciduous teeth. The space obtained can be managed with space maintainers.

Orthodontic movement can be used to bring the transposed tooth to its original position and to correct the intra arch symmetry\(^{(36)}\).

Another method is to maintain the transposed teeth in its position and reshaping the occlusal and incisal edges for restorative camouflage\(^{(36)}\).

Extraction of either one or both the teeth involved followed by orthodontic alignment\(^{(36)}\).

**Conclusion**

The prevalence and etiology of transposition were discussed along with the literature review. It was observed that the maxillary canine was the most commonly transposed teeth with the maxillary first premolar. A strong genetic predisposition was attributed to be the main etiology of transposition. Also various clinical management of transposition of teeth were described. Interceptive orthodontics to transposition can be the best way to manage it but if the early diagnosis is missed it can be managed through conventional orthodontic treatment.

**Ethical Clearance** – Not needed as it is a review article.

**Source of Funding** – Nil

**Conflict of Interest** – Nil

**References**


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Role of Thermography in Diagnosis of Patients with Temporomandibular Disorder

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Abstract

A temporomandibular disorder (TMD) is a very common problem affecting up to 33% of individuals within their lifetime. TMD is often viewed as a repetitive motion disorder of the masticatory structures and has many similarities to musculoskeletal disorders of other parts of the body. Treatment often involves similar principles as other regions as well.

Keywords: Temporomandibular disorder, Thermography, Myalgia, Myofascial

Introduction

Temporomandibular disorders (TMD) depend on a comprehensive history and physical examination, supplemented, when indicated, by images of hard and soft tissues. However, there are electronic diagnostic devices being marketed to acquire other measures described as relevant to TMD and to use these for diagnosis of TMD and for monitoring the effects of treatment. Changes in body temperature have long been regarded as an important diagnostic factor. Recently, rapid development in infrared radiation technology and its conversion to a visible image have given rise to a technique called thermography [1].

The undeniable advantages of thermography, such as its non-invasive evaluation approach, the absence of ionizing radiation, and the relatively low costs involved, are sufficient to recommend its inclusion among the additional tests widely employed to diagnose temporomandibular dysfunction (TMD) [2]. The validity of using thermography for dental diagnostic purposes, especially in the diagnosis of temporomandibular dysfunctions of the masticatory motor system, is still under review [3-7]. Some previous studies confirmed the diagnostic efficiency of thermography in identifying subjects with TMD [8-10]. Infrared thermography is a tool that can be applied to individuals with myogenous TMD due to the changes in the microcirculatory dynamics (i.e., there is a decrease in the skin temperature due to compression of blood vessels conditioned by muscle hyperactivity) [11,12], whereas skin temperature over the TMJ is increased in individuals with joint pain [13]. Moreover, individuals with TMD exhibit greater asymmetry in skin temperature than do those without this condition [14].

Thermography has many advantages – it is easy to use and non-invasive. However, there is a lack of standardized protocol for the temperature measurement of the masticatory muscles using infrared thermography. Gratt et al. [8] and Gratt and Sickles [14] evaluated the orofacial region by establishing 5 measurement areas: small TMJ, large TMJ, mandible, midface, and entire half-face. In another study by DibaiFilho et al. [15], the measurement of skin surface temperature was done in the muscle central point.

Materials and Method

Study Design: Case control Study

Study area: OPD, SreeBalaji Dental college and Hospital

Duration of the study: 3 months

Study Population:

Cases: cases with skeletal class – I & Angle class I malocclusion with Temporo Mandibular disorder
**Controls:** with skeletal class – I& Angle class I malocclusion without Temporo mandibular disorder

**Operational Definition of cases:**

Temporomandibular disorder (TMD) is a problem affecting the ‘chewing’ muscles and the joints between the lower jaw and the base of the skull.

**Selection Criteria:**

**Inclusion criteria:** Cases those who were coming to OPD with the symptoms of arthralgia, myalgia, local myalgia, myofascial pain, myofascial pain with referral and headache attributed to TMD

- 18 to 30 years
- Both sex were included
- Skeletal class – I
- Angle class I malocclusion

**Exclusion Criteria**

- Those who gave consent were only included
- Any chronic disorder like cancer was excluded
- HIV/AIDS cases was also excluded
- Patients undergone fixed prosthesis

**Sampling Method:**

Convenient Sampling

**Sample Size:** Those who were coming with the TMD for out patient department for a period of 3 months was enrolled

- 25 Case
- 25 Control

**Measurement:**

Temperature measurement

**Enrollment of Cases**

This diagnostic study was approved by ethical committee of SreeBalaji Dental College & Hospital, Chennai. Informed consent was signed from the patients or parents of the subjects. Patients with TMD’s who fall under the inclusion criteria were recruited for the study. Impressions & Photographic images (fig 1) were taken for all the subjects by a trained specialist in the TMD. Thermal images have been taken for all the subjects fig(2,3) involved using DITI-SCT640 Digital Infrared Thermal Camera. Patients who meet the inclusion criteria were assigned to two groups based on convenient sampling, group A (cases) and group B (Control).

**Statistical Analysis**

Statistical analysis was performed by using SPSS
software for windows (version 17) & probability value (p value) will be set as 0.05

Descriptive statistics was used to find out mean, standard deviation for demographic & outcome variable.

Paired t-test was used to find out homogeneity for baseline & demographic within the group.

Unpaired t-test was used to find out homogeneity for baseline & demographic variable between the group.

ANOVA was used to find out the significant difference between and within the groups variations

Results

In this study, a total of 25 cases (TMD) and 25 controls (without TMD) were enrolled. Of which Male was less in number than female. While comparing gender among cases there was no statistically significant association (kappa value-0.887).

Among the total recruited cases and controls, Average age group was 23 years, minimum age group was 18 years and the maximum age group was 29 years

Temperature Vs Right and Left TMD with control

Temperature with right and left and with and without TMD was compared and found that there was a highly statistically significant association as p-value 0.000.

While comparing right TMD temperature level with control group there was statistically significant difference observed as 0.000.

Table:1 Temperature in TMD

<table>
<thead>
<tr>
<th>Paired Samples Statistics</th>
<th>Mean temperature in C°</th>
<th>Total Number</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>Chi-square value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMD</td>
<td>Right</td>
<td>36.6637</td>
<td>50</td>
<td>.79480</td>
<td>.11129</td>
</tr>
<tr>
<td></td>
<td>Left</td>
<td>36.7441</td>
<td>50</td>
<td>.79377</td>
<td>.11115</td>
</tr>
</tbody>
</table>

Discussion

According to the study, there was significant association between temporo mandibular disorder and temperature recording using thermography. This is in concordance with the study done by Alvir Vieira Di Bai -Filho et al who observed similar findings and established that there was greater increase in skin temperature over the right and left TMJ in cases with TMD than with control.

In the present study there was temperature difference voted between the right and the left side. Right side TMJ exhibited higher thermographic temperature recording.

This is in concordance with the study conducted by Krzysztof Wozniak et al who observed similar findings and exhibited that absolute difference in temperature between right and left TMJ has high diagnostic value.

In the present study there was temperature difference noted between the right & the left TMJ and right side TMJ exhibited higher thermography temperature recording. This is in concordance with study conducted by Krzysztof Wozniak et al who observed similar findings & exhibited through their study that the absolute difference in temperature between the right and the left TMJ has high diagnostic value.

Conclusion

According to the finding of this study

There was no association for temporomandibular disorder with gender

There was no association for temporomandibular disorder with age

There is a strong statistically significant association within and between group of right and left temporomandibular disorder with respect to temperature levels
There was a strong statistical association between cases and control with respect to temperature level.

From the above summary, since a temperature difference was noted between the right and left temporomandibular joint and a significant difference was noted between the cases and controls, we concluded that temperature change can be taken as a diagnostic criteria in Temporo Mandibular Disorder cases.

**Ethical Clearance** – Institutional Ethics Committee, Sree Balaji Dental College and Hospital, Committee registered with DCGI. (Registration no: ECR/761/Inst/TN/2015)

**Source of Funding** – Nil

**Conflict of Interest** – Nil

**References**


Hemangioma of Tongue – A Case Report

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Abstract

Vascular anomalies of the oral cavity are very rare. Hemangioma is the most common vascular anamoly. Here, we report a case of hemangioma in the Anterior two third of the tongue in a 37 year old male which appeared localized well defined, reddish pink and lobulated mass with well-defined margins on intra-oral examination. Doppler suggesting a vascular etiology. Further evaluation was done on magnetic resonance imaging, which confirms its vascular nature and diagnosed as a case of hemangioma.

Keywords: Doppler, hemangioma, tongue, ultrasonography, vascularity

Introduction

Hemangiomas are benign proliferation of dilated blood vessels & capillaries.¹,²

It is a proliferation of the endothelial cells which lines vascular channels. It is a benign developmental abnormality, characterized by onset during infancy and regresses as the patient ages. ³The term hemangioma was first coined by Sznejder et al in 1973 & was called “Haemorraghic Hemangioma”.² They are considered as benign tumors, being characterized by 3 stages: endothelial cell proliferation, rapid growth and lastly spontaneous involution. ⁴⁵ It can cause esthetic and functional impairment in the oral and perioral region depending on the location. The most common site is the lips, but other areas, such as the tongue, buccal mucosa and palate have also been reported. Clinically, they present as swellings filled with blood or as red or bluish-purple discolorations that, depending on the depth of the lesion and the localization of the affected tissue, disappear momentarily on digital compression or diascopy.⁶

Here we present a case of a 37 year old male patient who presented with a swelling in the tongue for the past 1 year which was diagnosed as hemangioma of tongue after clinical and radiographic analysis.

Case Report

A 37 year old male patient came with a chief complaint of painless swelling in the tongue for the past 1 year. There was no association of pain in the region. Patient had no difficulty in swallowing and breathing. No history of bleeding from the region of swelling. On examination of intraoral swelling, a solitary swelling was present on right dorsal surface of the anterior 2/3 of the tongue more towards the lateral border measuring approximately 2X1cm in size, dome shaped, with well-defined margins. The surface was smooth with normal papillation and it was slightly bluish in colour. On palpation, the swelling was soft, immobile, compressible, with pulsation. (figure 1,2)

Correlating the chief complaint, history of presenting illness and intra-oral examination a provisional diagnosis of benign tumour of the tongue was arrived and a differential diagnosis of fibroma of tongue, myoma of tongue and hemangioma of tongue was given.

Ultrasonography revealed a well-defined heterogenous hypoechoic lesion in the submucous plane of the tongue in the posterior right lateral border with evidence of tiny cystic components. The lesion showed high vascularity and multiple feeding vessels. (figure 3) Magnetic resonance imaging (Wide Bore 48 Channel 1.5 T High Field MRI-neck with contrast) revealed 16X15X18 mm size developmental venous malformation (hemangioma) in the right side of the anterior 2/3rd of tongue, involving the intrinsic muscles. The lesion involving on the genioglossus and hyoglossus. 42mm (AP) X 24 mm (CC) X 17mm (TRANS) size venous malformation in the floor of the mouth in the right side between anterior belly of digastric & mylohyoid and...
extending to the sublingual space along the anterior aspect of mylohyoid. Few hemangiomas noted in the tongue, right masseter, anterior to the right ramus of mandible and right side of the soft palate. On contrast administration, the lesion shows heterogenous enhancement. (figure 4,5,6) Depending on the clinical features, a diagnosis of hemangioma of the tongue was given. No surgical intervention was given as the patient had no discomfort.

Figure 1 swelling was present on right dorsal surface of the anterior 2/3 of the tongue

Figure 2 View showing the lateral aspect of the tongue

Figure 3 Ultrasonography showing hypoechoic lesion in the submucous plane of the tongue with high vascularity and multiple feeding vessels.

Figure 4 Sagittal view MRI showing developmental venous malformation anterior 2/3rd of tongue involving the intrinsic muscles

Figure 5 Coronal view MRI showing developmental venous malformation in ramus of mandible.

Figure 6 Axial view MRI showing developmental venous malformation in the soft palate.

Discussion

There is a complex, rich and intricate blood vessels in the oral cavity, head and neck region which makes it susceptible to a variety of vascular lesions. They may or may not be present at birth but become clinically appreciable in late infancy. Endocrinal changes, infection and trauma also affect their size and growth. The common vascular lesion affecting head and neck region is hemangiomas which are usually seen 2-4 weeks after birth, then grow rapidly till the age of 6-8 months and
further at slow rate. There is also a female predilection with a ratio of 3:1. However, the present case was observed in a 37 year old male. Around 70-80% of hemangiomas occur as a single lesion, while multiple lesions are found in 20% of affected patients with rare tongue involvement. Oral hemangiomas are most common in the regions of the lips, tongue and buccal mucosa, presenting as red, purple or violet macules or nodules of variable size, which may be well-delineated or diffuse and are relatively depressible. Hemangiomas are rarely encountered by clinicians even though they are considered one of the most common soft tissue tumors of the head and neck and it is rare in the oral cavity. Where large lesions may impinge on vital anatomical structures, such as the facial nerve or orbit, radiographic analysis is indicated. Computed tomography (CT) and magnetic resonance imaging (MRI) are also be used for volumetric analysis of hemangiomas and vascular malformations. In both diagnostic differentiation and analysis of lesion features with regard to its size, extension and location, and for follow up of lesions imaging plays a vital role.

There are several suggested pathogenesis for hemangioma. Some authors have hypothesized that angiogenesis plays a vital role in vascularexcess present. Cytokines like basic fibroblast growth factor (bFGF) & vascular endothelial growth factor (VEGF) are reported to induce the process of angiogenesis. It has been suggested that there is an imbalance in the factors that stimulates angiogenesis & the factors which control angiogenesis. The growth factors which are precisely involved in angiogenesis during the proliferation phases of haemangioma are VEGF, b-TGF, and IGF.

Treatment of hemangiomas is dependent on their location, size and nature i.e whether it is venous or arterial. For lesions which are small those which are situated in the periphery, treatment options include sclerotherapy, laser therapy, radiotherapy, conventional surgical excision, laser treatment, electrocoagulation and cryotherapy. When the lesions are large and/or intraosseous, and located in areas with esthetic impact, embolization or obliteration of the lesion and adjacent vessels should always be done. this procedure is stipulated with the intent of attaining involution of the lesion for a successive surgical procedure.

Sodium morrhuate, sodium sulphate tetradecyl, polidocanol and ethanolamine oleate, and hypertonic glucose solution are some of the sclerosing agents available and which can provide first rate results. In our case there was no surgical intervention or any kind of treatment was done as the patient had no difficulty or discomfort associated. The patient was followed up for every 6 months with no changes up till date.

**Conclusion**

Intraoral hemangioma rarely occurs on the tongue. Early detection and correct diagnosis are important steps in managing hemangiomas of the tongue. Depending on the location of the hemangioma they can cause functional and esthetic impairment. Proper clinical, radiographic and sometimes histologic analysis has to be done to come at a correct diagnosis keeping in mind the differential diagnosis & the advanced technology in diagnosis of the lesions.

Therefore, imaging modalities like ultrasound with Doppler, CT and MRI are of utmost importance. In our present case also it was arrived to a case of hemangioma of tongue after MRI and ultrasonography. A thorough knowledge about these lesions is mandatory for clinicians to avoid risk during the treatments like the flap surgery, extraction of teeth etc as they can result in profuse bleeding creating an emergency situation.

**Ethical Clearance** – Not needed as it is a case report

**Source of Funding** – Nil

**Conflict of Interest** - Nil

**References**


Obstructive Sleep Apnea Syndrome in Orthodontics (OSA)-
Review of the Literature

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Abstract

Obstructive sleep apnea is one of the most common breathing disorder during sleep. Long term OSA may lead to depression, cardiovascular diseases, metabolic disorder, cognitive impairment. Inferior hyoid bone position in relation to line drawn from third cervical vertebra to menton is one of the important finding related to OSA pathophysiology. Orthodontist can make an important contribution to diagnosis and management of OSA.

Key words: Obstructive sleep apnea, Airway obstruction, Cephalometrics, Hyoid bone.

Introduction

Obstructive sleep apnea is characterized by collection of signs and symptoms such as arterial blood oxygen desaturation, fragmentation of sleep caused by obstruction of pharyngeal airway during sleep, reduction in intra thoracic pressure, withered executive function, central nervous system arousal and excessive daytime sleepiness. The prevalence of OSA in adults is between 14.7% to 34.2%, of which 82% women and 93% men remains undiagnosed. Cephalometrics play a major role in identifying OSA with sensitivity of 93% and specificity of 21%. Lower hyoid bone position is due to accumulation of fat in pharyngeal regions which pushes hyoid bone more anterior and inferior.

TYPES:

1. Obstructive apnea
2. Central apnea
3. Complex Mixed apnea

SUBTYPES OF OSA:

1. Severe AHI > 30
2. Moderate AHI is 15 to 30
3. Mild apnea AHI < 15

Epidemiology

OSAS is the second most common disease in order among the different respiratory disorders.

OSA affects 2-4% of the adult population. One out of every 5 adults suffers moderate OSAS, and one out of every 15 presents moderate to severe OSAS.

The syndrome is characterized by decreased oxygen levels in blood, tense breathing, and repeated arousals during sleep, excessive sleepiness during the daytime, headaches during wakingup, lack of concentration and systemic disorders.

Pathogenesis

Several factors are involved in the development of OSAS. The main causes for OSAS are reduction in expansion forces of the pharyngeal dilator muscles, as in situations of genioglossal muscle dysfunction, and lack of coordination between the inspiratory activity of the muscle and respiratory efforts, which play an important role in progression of the disease.
Other factors are increase in size or length of the soft palate, unessential pharyngeal mucosa, macroglossia, and tonsillar hypertrophy \(^{(6)}\).

Pae et al. found that the shape of tongue in patients with OSAS is different from that of normal subjects in the supine position, this being the first study to evaluate tongue shape in the supine position. Therefore, shape of tongue may play an important role in the development of OSAS \(^{(7)}\).

Increased adipose tissue in the neck region particularly in obese patients with fat infiltration and edema in the soft palate \(^{(9)}\) or altered anatomy of upper airway, as in Pierre Robin syndrome \(^{(8)}\), are also incriminated in this syndrome.

The perimeter of neck is more closely correlated to severity of the syndrome than body mass index or obesity \(^{(9)}\).

**Features of OSAS**

OSAS has distinct signs and symptoms during daytime and night time.

- **Nocturnal symptoms**

  **Snoring**

  Snoring is due to the narrowing of the upper airway and intermittent airway collapse during sleep. Generally it is observed and reported by the spouse of the patient, to the doctor. Even though snoring is the most common symptom of OSAS, it is of very little diagnostic value as snoring is also very common among the general adult population. Suspected OSA patients, apart from having a history of snoring for a long time, they are reported to have more intense and irregular snoring overtime \(^{(10)}\). This can be due to various reasons such as increased body weight, alcoholism, use of muscle relaxants or even menopause in women.

  **Observed apneas**

  Apneas are alarms to the patient and calls for an immediate consultation. They are mostly described as respiratory pauses, interrupting the snoring while the patient continuously makes efforts to breathe. observed apnea indicates high apnea/hypopnea index \(^{(5,6)}\).

  **Daytime symptoms**

  **Daytime sleepiness**

  Fragmentation of sleep in the night due to electroencephalographic awakening that terminates the apneas or hypopneas leads to Excessive daytime sleepiness, which is the most important symptom of OSAS. Various other consequence of daytime sleepiness are apathy, concentration difficulties, Depression, memory loss, morning headaches and decreased libido.

**Diagnosis**

A proper medical history, familial history and personal history (adenoidectomy, tonsillectomy, alcoholism, use of muscle relaxant drug, obesity etc.) is very essential for the proper diagnosis of OSA. Sometimes in certain profession, OSA can lead to medical emergency, so the profession of the patient is also to be noted.

Physical examination such as height, weight, BMI, CVS evaluation, exploration of upper airway is also done. It is followed by conventional lateral cephalogram which will reveal any anomaly in patients anatomy that can predispose them to OSA \(^{(11)}\).

A line drawn from third cervical vertebra to menton on lateral cephalogram serves as a guideline to diagnose OSA. In simple snorers, the hyoid bone was present in the line whereas in OSA patients the hyoid bone was present far below the line.

OSA can also be diagnosed with many tests. The most commonly used test is Polysomnography (PSG). It helps to monitor a lot of things like – respiration, sleeping state, snoring and even movements of legs. It can also record the stages of sleep, its distribution, the number of awakening, the number of apneas/hypopneas. The starting time of sleep and also the number of efficient hours of sleep is also recorded. PSG also gives the apnea/hypopnea index (AHI), according to which if AHI > 30, it is very serious apnea and need surgical intervention. If AHI is 15 to 30, it is moderate apnea and AHI < 15 it is mild apnea. PSG is expensive test and complex technique. Nowadays simple tests are developed and used in many healthcare systems which are less expensive and can be used atpatient’s home \(^{(8)}\).

Sleep fragmentation and high frequency of Respiratory effort – related auorsal (RERA) events is associated with myofacial pain in TMD.
Lavezzi et al proposed class III malocclusion children having OSA are analysed with PHOX2B gene.

When compared with healthy population, patients suffering from OSA have smaller airway size and palatal volume.

**Sleep disorders and Chronic craniofacial pain**

Improper sleep and headaches are very closely related to each other. Headaches are characterized according to frequency or proximity to sleep by most epidemiological studies. Headaches can be due to fragmented sleep, changes in sleeping position and frequent awakenings. Children with poor sleep quality and excessive daytime sleepiness, often complain of headaches. Headache clinics found that insomnia to be the most common sleep complaintin nearly two-third of patients.

In primary headaches the quality of sleep is reduced. It causes symptoms of central sensitization such as allodynia and pericranial tenderness. An average of 7-8 hours of sleep duration was associated with reduced headaches. The extreme ends of sleep durations like less than 6 hours or more than 8.5 hours were associated with increased headache intensity.

Sleep is both the cause and cure for headaches. The first symptom of sleep disorder may be headache. According to ICSD (International Classification of Sleep Disorder) Migraines, cluster headaches, hypnic headache and chronic paroxysmal hemicranias are all classified as sleep related headaches.

**Treatment options**

Behavioural modifications are vital in the treatment for patients with OSA. A regular sleep schedule, adequate sleep, using only the bed to sleep, avoiding spending too much unwanted time in bed and using the bed for other recreational activities should be avoided. Alcohol and smoking should be strictly avoided. It is because smoking causes inflammation in upper airway, thereby increasing chances of airway collapse. Alcohol exacerbates the episodes and duration of apneas. It also causes sleep fragmentation and arterial desaturation.

The American Association of Sleep Disorders has advocated the use of oral appliances to eliminate snoring or sleep apnea. It can be further classified as mandible advancement appliances, lingual retainers, appliances which act upon the soft palate and combined advancement and continuous positive airway pressure appliances.

**Mandible advancement appliances:**

The mandible advancement appliances, are constructed in such a way that they advance the mandible up to 80% of the maximum protrusion. They can be of Monoblock type or devices with two splints. There was no difference in the success rate observed between these two designs. These appliances produced a lower AHI scores as found out by PSG, thereby contributing to their success rates.

Various authors have reported pain in the incisor region, joint discomfort, facial muscle discomfort as side effects of these appliances while others authors have reported, only minimal orthopedic and dental effects.

When these appliances were compared with Continuous positive airway pressure (CPAP), they were found to be less effective in reducing AHI scores.

Sullivan introduced CPAP in 1981. The patient is made to wear a mask at night that will impel air into the upper airway. This in turn raises the air pressure in pharynx. The air forces the soft palate to move forwards, thereby allowing pressure to reach the upper airway, which prevents it from collapsing. It is effective and has shown reduced AHI score < 5 but has poor patient acceptance.

**Surgical treatments:**

It is considered after failure of non-surgical interventions.

- **Tracheotomy**

  It is the first described surgical technique. Tracheal hole is kept closed throughout the day. A plug is used to help breathe through nose/mouth. Plug is removed at night, so air can penetrate distal part of trachea.

- **Uvulopalato-pharyngoplasty (UPPP)**

  Described by Fujita et al. UPPP corrects obstruction at oropharyngeal level. Uvula is modified and the posterior and anterior pillars are closed to expand the retropalatine tract. Kamami first described laser assisted
UPPP in 1980. It was first choice of treatment, but it improved the condition by only 50% of all OSAS patients.

-Tonsillectomy

Hypertrophic tonsils can cause OSAS. In obstructive tonsils, tonsillectomy at any age, has positive impact on obstruction of upper airway. Krespi and Ling described Tonsillectomy procedures with CO$_2$ laser. Laser surgeries took less time, less bleeding and less post-op pain. Another technique is Radiofrequency ablation of tonsils. In this technique, electromagnetic rations produced heat within tissues. Trials suggest less pain than with respective surgery$^{(5)}$.

-Maxillo-Mandibular advancement by osteotomy:

The first choice of treating OSAS. Advancing the mandible, stretches anterior digastric, mylohyoid, genioglossal and geniohyoid muscles. It also stretches the tongue forwards and away from the pharynx.

Success rate is 75 to 100%. AHI scores improved long term. Results were stable over time. Lye et al in 2008 reported high success rate with bimaxillary advancement. Indications of MMA is AHI >15, low oxygen saturation and ineffectiveness of mandibular advancement, weight loss. MMA is done in patients with 

Multiple sites of obstruction

Skeletal class 2 malocclusion.

A case was reported by Coney et al, of a patient with OSAS, who underwent transverse osteogenic distraction of maxilla, combined with maxilla – mandibular advancement. There was a significant improvement of the apnoea reported. MMA surgical procedure, leads to a greater posterior and lateral airway dimensions, with minimum complications$^{(15)}$.

Conclusion

Orthodontists developed newer and simpler methods to find OSA using cephalogram, which helps to prevent OSA patients leading to metabolic disorders and systemic diseases and restores them nearer to normal lifestyle.

Ethical Clearance – Not needed as it is a review article

Source of Funding – Nil

Conflict of Interest – Nil

References


Review Article

Temporomandibular Disorder in Pregnancy

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Abstract

Pregnancy is a happy stage in life of every woman, but at the same time it is a rather difficult period, since pregnancy represents a serious strain on the body. In the body of a woman during this period there are significant physiological changes that ensure the correct development of the fetus, prepare the body for the upcoming delivery. In this difficult period, the burden on all organs and systems of the woman’s body is significantly increased. Especially often suffer joints; there is a risk of permanent pain, the development of diseases or exacerbation of existing diseases. One of the most common problems is Temporomandibular Dysfunction or Disorder (TMD) which many women face, but still hasn’t been explained.

Key words – Pregnancy, TMD, Estrogen

Introduction

The term ‘temporomandibular disorder’ (TMD) embraces a number of clinical problems that involve the masticatory muscles and/or temporomandibular joints (TMJ) and associated structures. Temporomandibular disorder is the second most prevalent source of orofacial pain. A number of studies have also identified genetic (e.g., COMT, SCN1A) and inflammatory criteria of (e.g., free radicals and cytokines) risk factors that contribute to the development of TMD. According to epidemiological data, there is a strong predilection of TMD for women. The prevalence is the highest during reproductive years and the lowest before puberty and after menopause. The male to female ratio of TMD patients is estimated at around 1: 3 . It is suspected that this predisposition is related to female reproductive hormones, especially estrogen. The effects of estrogen are mediated by binding to its receptors. Three types of estrogen receptors are distinguished, two nuclear – alpha (ERα) and beta (ERβ), and one plasmatic – G-protein coupled estrogen receptor 1 (GPER1). Since 1986, when estrogen receptors were recognized for the first time in baboon temporomandibular joints, the potential influence of estrogen on TMD has become a matter of interest to many researchers. It is now known that estrogen receptors are localized in many structures of the stomatognathic organ, particularly TMJ tissues, such as chondroid tissue of condyle and retrodiscal tissues. Studies on the effect of estrogen deficiency performed on animal models revealed that estrogen depletion causes structural changes in TMJ. These include an increase in TMJ cartilage thickness, a decrease in subchondral bone volume, flattening of condyles, osteophyte formation or even serial degenerative changes.

The effect of estrogen on the development, restitution and metabolism of the temporomandibular joint and associated structures is one of the possible mechanisms in which these hormones can influence the incidence of TMD. Another probable mechanism is the modulation of the pain regulative mechanisms by estrogen. The presence of its receptors in tissues of both the peripheral and central nervous systems makes estrogen capable of modifying pain signaling . Estrogen receptors (ERα, ERβ) are found in the dorsal root ganglion (DRG) as well as in the trigeminal nerve nucleus. The influence of estrogen on pain regulatory
mechanisms seems to be very complex. Depending on the pain signaling type, estrogen may act as a pro- and anti-nociceptive. In physiological pain, estrogen seems to decrease pain while, in inflammatory pain, estrogen acts differently depending on the inflammation type. In acute inflammatory pain caused by formalin or ATP injection, estrogen has an anti-nociceptive effect. In the chronic inflammatory pain model with complete Freund’s adjuvant (CFA) or carrageen injection, the pro-nociceptive effect of this hormone is seen. It is worth noting that blocking estrogen receptors α and β diminishes sex differences in both physiologic and acute inflammatory pain. Recently, some estrogen related genetic factors predisposing to TMD have been discovered. ERα gene polymorphism causes receptor overexpression which makes certain allele carriers more susceptible to the effects of estrogen by enhancing processes associated with ERα receptor stimulation.

Etiology

Pregnancy produces dramatic changes in levels of estrogen & progesterone. Both estrogen & progesterone levels rise during pregnancy. Estrogens are known to increase joint laxity, at least during pregnancy, & laxity of temporomandibular joint is thought to play a role in development of some these disorders. Another possibility is that is that estrogens enhances a number of specific inflammatory responses in the temporomandibular joint. Another possible factor may be relaxin. Relaxin levels increase 2- to 3- fold during pregnancy. Increased systemic joint laxity in pregnant women has been linked to elevated levels of relaxin. As the levels of relaxin & estrogen increases throughout pregnancy, laxity of the temporomandibular joint may increase & there may be a tendency to TMD.

The symptoms classically associated with Temporomandibular Dysfunction (TMD) include

- Limitation of jaw range of motion
- Painful jaw range of motion
- TM joint clicking
- TM joint locking
- A sense of a bite discrepancy
- Tension in the face
- Daily headaches in the temples
- Morning headaches on arising
- Sore jaw muscles
- Jaw pain while eating
- Neck Tension

In addition, ear symptoms are rather common when a Temporomandibular Disorder is present. Ear symptoms can include pain, a sensation of stiffness or fullness, and a variety of odd sounds such as ringing, humming, buzzing, and whistling. Other less frequent symptoms include:

- Loss of balance and a sense of unsteadiness
- Tingling sensations in the face and jaw
- Some of these symptoms are directly related to the muscles of the face and/or TMJoint while others have their origins in the upper neck region.

TMJ treatment

TMJ problems are orthopaedic in nature and are the result of tired, tight, injured or sore muscles, inflamed tendons, or compromised ligaments, bone and cartilage. As a result, TMJ treatment options are similar to those offered by an Orthopaedist when managing a knee problem, for instance. The first step in TMJ treatment, of course, is to try to prevent further injury by avoiding certain foods (bagels, tough crusty breads, tough meats, uncut apples), and controlling any daytime behaviors that put strain on the jaw muscles or TMJ’s. These activities include:

- Gum chewing
- Nail and cuticle biting
- Biting on pen caps, straws, plastic items
- Teeth clenching
- Biting on your lips or cheeks
- Wide or frequent yawns
- Holding your glasses between your teeth
- Leaning your chin into your hands while at work, on the computer, or watching TV
- Phone cradling
- Ice chewing.
At times, compromise of the TMJoint and jaw muscles will require the use of an oral appliance (bite plate), which can be compared to a knee brace. These devices have different shapes and forms, can be made of variable materials and have different goals. Most importantly, they cushion the TMJs and diminish tightness in the jaw muscles. Over-The-Counter oral appliances sold in pharmacies can at times be used to protect the teeth over the short term, but remember, they are not designed to manage a jaw problem over the long term! If you’re pregnant, have had TMJ problems in the past, and suspect that they are beginning to resurface, see your dentist before it gets worse.

A custom-bitted night guard, a routine of jaw exercises, and some general relaxation techniques may just be what you need to relieve the symptoms and allow you enjoy the rest of your pregnancy.  

- Jaw exercises and physical therapy
- Medications (oral, topical, injectable)
- Massage
- Acupuncture
- Trigger point injections for pain and muscle tension in the jaw and neck muscles
- Behavior Modification strategies
- Breathing techniques

On occasion is there a need to move teeth or do other dental work to manage a jaw related problem. In some instances, changing the way teeth come together, or providing dental care to improve the efficiency of the chewing surfaces of the teeth may help jaw related problems.

Summary

The term ‘temporomandibular disorder’ (TMD) embraces a number of clinical problems that involve the masticatory muscles and/or temporomandibular joints (TMJ) and associated structures. Temporomandibular disorder is the second most prevalent source of orofacial pain. A number of studies have also identified genetic (e.g., COMT, SCN1A) and inflammatory criteria of (e.g., free radicals and cytokines) risk factors that contribute to the development of TMD. According to epidemiological data, there is a strong predilection of TMD for women. The prevalence is the highest during reproductive years and the lowest before puberty and after menopause. The male to female ratio of TMD patients is estimated at around 1: 3. It is suspected that this predisposition is related to female reproductive hormones, especially estrogen. Causes of pregnancy is due to dramatic changes in levels of estrogens and progesterone. Both estrogen and progesterone levels rise throughout pregnancy. And another hormonal factor is relaxin. Estrogens & relaxin are known to increase joint laxity. And increase in joint laxity gives rise tendency to TMD. Symptoms of TMD are painful jaw range of motions, limitation of jaw range of motion, TM joint clicking, TM joint locking, jaw pain while eating, neck tension, a sense of bite discrepancy, morning headache on arising. Ear symptoms are common in TMD. Ear symptoms can include pain, a sensation or fullness, variety of odd sounds like ringing, humming buzzing & whistling. Treatment of TMjoint & jaw muscles will require the use of oral appliance (bite plate), custom bitted night guard, a routine of jaw exercises & some general relaxation techniques.

Ethical Clearance – Not needed as it is a review article

Source of Funding – Nil

Conflict of Interest – Nil

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Combination Approach of Full Mouth Rehabilitation in Partially Edentulous Patient - A Case Report

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Abstract

Restoration of a partially edentulous patient’s mouth with complete esthetic and functional reconstruction may present numerous problems to the dental professional. The severe wear and collapse of anterior & posterior teeth results in the loss of normal occlusal plane and the reduction of the vertical dimension of occlusion. The major concerns include establishing centric relation, esthetics, phonetics and vertical dimension. Taking this into consideration this case report explains in detail the step-by-step procedure in treatment planning to completely rehabilitate a 43 year-old partially edentulous patient using a combination of fixed and removable prosthesis.

Keywords: Edentulous, RPD, PFM.

Introduction

A 43 year old female patient reported to Sree Balaji Dental College and Hospital with chief complaint of multiple missing & decayed teeth. On intra oral examination Missing irt 12,16,22,23,35,36,37,44,45,46,17 (fig 1 & 2), Decayed irt 17,27,42 associated with collapsed vertical dimension and unsatisfactory occlusion. Anatomic landmarks, facial measurements and the resting positions of mandibular jaw were used to determine appropriate vertical dimension for the patient.

Fig 1: Missing teeth in maxilla

Fig 2: Missing teeth in mandible

Fig 2: OPG

OPG were taken and examined (fig 3). Intraoral & extraoral condition was analysed, then different treatment plans ranging from conventional RPD to implants were made and discussed with the patient to restore the function and aesthetics of the dentition.
Examination of radiograph and anatomical factors like maxillary sinus floor position and residual ridge resorption, patient was made aware of the steps involved before and during the surgery. Regarding treatment plan the patient was not willing for surgical procedures and was satisfied from the previous RPD. So, For these reasons, instead of implant prosthesis, combination of fixed and fixed removal prosthesis in a form of extra coronal attachment was suggested to the patient and its advantages and disadvantages were also discussed. After taking patient’s approval clinical procedures were initiated. Impressions were made with alginate and casts were poured.

Face bow transfer were done for the diagnostic mounting with anterior deprogramming done using lucia gig and Occlusal wax rims were fabricated on the diagnostic casts and later they were mounted in centric relation for prosthodontic evaluation.

After restoring the VD, crown lengthing was done using biolaseirt 14,15 to achieve optimal crown – root ratio. All the teeth were prepared. Temporary restoration was fabricated with Protemp finished and cemented with temporary cement. Try-in of temporary partial denture was also done. The patient was satisfied with the provisional restoration. Thus, it was decided to reproduce the temporary VD and centric relation (CR) state on the final restoration. Gingival displacement was done using single cord technique. Definitive impressions were made with polyvinyl siloxane impression material using putty wash technique. The preglaze trail was done for PFM crowns and precision attachments wax-up try-in were done. Temporary denture base were adjusted to accommodate the precision on attachment bilaterally with a lingual bar. Posterior teeth arrangement and PFM crowns were prepared and try-in was carried out. Clinical adjustments were done.

The glazing of PFM crowns and acrylization of attachment retained partial dentures were completed. Pink colour rubber rings were placed (as manufacture’s instruction) in the female counter part slots present in the CPD using inserting tool . These rubber rings make the CPD retentive and stable and at the same time act as stress breakers. Crown and bridges were cemented with the CPD attached (Fig 6). Extra care was taken during cementation by applying petroleum jelly to the attachments and all parts of CPD to make removal of cement easily. After the final set-up, routine check-ups...
were performed in every 3 months for one year. The final result satisfied the patient’s chief complaints with the combination fixed partial dentures and semi precision retained CPD bilaterally with a lingual bar.

**Discussion**

Full mouth rehabilitation is not only the restoration of the worn out dentition, but also maintenance of the health of the entire stomatognathic system. Full mouth rehabilitation should re-establish a state of functional as well as biological efficiency where teeth and their periodontal structures, the muscles of mastication, and the temporomandibular joint (TMJ) mechanisms all function together in synchronous harmony\(^{(1)}\). A variety of philosophies are been used in full of reconstructions, they are twin stage philosophy, Pankeymannschyularphilosophy, etc. These techniques assist in concomitant laboratory construction of the units. When all of the prepared teeth are on a single articulator, there is flexibility in developing the occlusal plane, occlusal theme, embrasures, crown contour and esthetics \(^{(2)}\). The advantages of the simultaneous and quadrant full-mouth reconstruction are combined in the present technique. The chairside disadvantages include arduous, unpredictable patient visits, full arch anesthesia, full arch chairside treatment restorations, multiple occlusal records and possible loss of the VDO. Treatment restorations also provide a stable and esthetic interim prosthesis during the fabrication of the final restoration and allow appraisal of an altered VDO.

In 1984, Turner and Missirlian classified the treatment of a severely worn dentition by the amount of the loss of VDO and available space to restore. His classification and conventional treatment, which includes raising VDO with multiple crown-lengthening procedures, have been widely used\(^{(3)}\). The occlusal splint, which is reversible and conservative in nature, has been used as a diagnostic tool to judge adaptation to the altered VDO. The waiting period to judge adaptability is between 3 weeks and 5 months for the occlusal splint and 2-6 months for the provisional prosthesis \(^{(4)}\). In this case, the patient was carefully monitored for 6 weeks to evaluate the adaptation to the removable partial denture. Furthermore, the patient’s adaptation to the provisional restoration was monitored. Discomfort, wear and muscle fatigue were not observed during this period.

The restoring of VDO was determined by standardized esthetic golden proportion of anterior teeth and also by patient’s factors like interocclusal rest space and speech. If the increase of VDO was decided arbitrarily without close evaluation, multiple complications could arise. Depending on the patient’s situation and adaptability, the interim period can be modified.

**Conclusion**

The reasons for undertaking occlusal rehabilitation may include the restoration of mutilated teeth. Increasingly, occlusal rehabilitation is also required to replace improperly designed and executed crown and bridgework. Full mouth rehabilitation involves restoring the teeth, jaw muscles and self-esteem back to a natural looking condition. Optimum oral health should be the prime objective of all rehabilitation procedures because the ultimate goal will always be to restore the mouth to health and function and preserve this status throughout the life of the patient.

**Conflict of Interest**: Nill

**Source of Funding**: Nill

**Ethical Clearance**: Not needed – case report

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Abstract

Dental implants are widely used in dentistry to replace removable dentures among edentulous and partially edentulous patients. Since the demand for dental implants, artificial tooth roots, has grown considerably. Dental implants are used to replace removable partial or full dentures in edentulous and partially edentulous patients. Implants and implant-supported prostheses offer greater stability, comfort, and aesthetics than any other removable prostheses.

Keywords: MMP8, Biomarker, GCF, PICF

Introduction

Dental implants are titanium fixtures placed into the jaw bone during surgery. Titanium is the most common biometal used in endosseus dental implants because of its excellent biocompatibility properties in physiological conditions. The term osseointegration means direct bone contact with an alloplastic metallic implant. The hard and soft tissues surrounding an osseointegrated implant show some similarities to the periodontium around natural dentition. The gingiva around dental implants is called periimplant mucosa, and consists of well-keratinised oral epithelium, sulcular epithelium, and junctional epithelium with underlying connective tissue. Between the implant surface and epithelial cells are hemidesmosomes and the basal lamina. The most significant difference between natural teeth and implants is that implants lack the periodontal ligament. The collagen fibers are unattached and parallel to the implant surface rather than in functional contact from the bone to the cementum. The titanium screw attaches directly to the alveolar bone, which is in direct and tight contact with the implant surface.

Implant Versus Natural Tooth

Peri-implantitis is an inflammatory disease that affects alveolar bone and soft tissues around implants, eventually leading to loosening of the implant. The aetiopathogenesis of peri-implantitis remains somewhat unclear, but has a similar infectious and inflammatory background to the pathogenesis of periodontitis.

Laminin-332 is a glycoprotein essential to the adhesion of epithelial cells, especially in the formation of hemidesmosomes, and is produced in the oral cavity by gingival epithelial cells. The Ln-332 molecule consists of three different polypeptide chains, of which the _2-chain is specific to Ln-332. Several matrix metalloproteinases (MMP) can cleave the Ln-332 _2-chain into smaller fragments. This cleaved Ln-332 stimulates the migration of gingival epithelial cells and is believed to play a central role in the apical migration of sulcular epithelial cells and in the formation of periodontal pockets.

MMP8 And Its Importance

MMPs are catalytic proteins, enzymes capable of cleaving almost all extracellular matrix (ECM) and basement membrane (BM) proteins. MMPs are involved in many physiological processes such as bone formation, tooth eruption, and wound healing. MMP-8 is one of the most efficient enzymes in degrading type I collagen. MMP-8 is produced by many different cells in different tissues, but is expressed most dominantly by polymorphonuclear leukocytes (PMN). During inflammation, PMN cells invade from vessels to tissues, where they release MMP-8. Many studies explain the MMP-8 levels are pathologically elevated in human periodontitis and in periimplantitis.

MMP-8 Levels And Activation In GCF And PISF

GCF can be used in the diagnostics and investigation of the severity and degree of inflammation. The enhanced expression and activation of various MMP enzymes has
been demonstrated in periodontitis as well as in peri-
implantitis, where MMPs are believed to mediate multiple
functions associated with periodontal destruction and
inflammation\(^7\). Various study found that MMP-8 activity
was, together with GCF and PISF flow, enhanced with
increased clinical severity and degree of inflammation
in CP and PI. Furthermore, MMP-8 active forms in GCF
and PISF contribute to GCF/PISF collagenase activity.
GCF has been used to evaluate the risk for an individual
to develop periodontal disease as well as to monitor the
host response to periodontal therapy. MMP-8 levels and
activation reportedly to be increase during periodontal
inflammation, and MMP-8 can serve as a diagnostic tool
to monitor periodontitis\(^8\). The present result suggests
that PISF could also serve as a diagnostic tool in the
samemanner as GCF. Furthermore, MMP-8 levels and
PISF flow in diseased PI sites were even higher than
therespective levels and flow in severe CP sites.
Because periodontal and peri-implant inflammation are
associated with the extravasation and migration of
neutrophils towards the periodontal pocket and an
increase in the amount of GCF and PISF volume, these
phenomena (increase in PISF flow and MMP-8 activity)
could be attributed to even more rapidly progressing
inflammation, increased vascular permeability, PMN
activity, and influx into the peri-implant mucosal tissues
in PI than in CP. The results make PISF interesting and
important in the future investigation of the diagnostics
of peri-implant inflammation. Elevation and activation
of multiple species of PMN- and fibroblast-type MMP-
8 reflect periodontal and peri-implant inflammation,
and that MMP-8 is more likely to be produced in many
cellular sources rather than in single cellular sources in
diseased periodontium or peri-implant mucosa\(^7\).

## Discussion

MMPs are host proteinases responsible for both
tissue degradation and remodeling. During progressive
periodontal breakdown, gingival and periodontal
ligament collagens are cleaved by host cell-derived
interstitial collagenases. One vital interstitial collagenase
capable of degrading the triple helical structures of
native types I, II, and III collagens found in alveolar
bone matrix is collagenase-2. Collagenase-2, also
referred to as MMP-8, is released during the maturation
of PMNs in the bone marrow. Once produced, it
becomes glycosylated and is prestored in the sub-
cellular-specific granules, where it is subsequently
released in large quantities as the PMNs are recruited to
a site of inflammation. Chubinskaya et al. demonstrated
the ability of non-neutrophil-lineage mesenchymal
cells, such as human gingival and periodontal ligament
fibroblasts and chondrocytes, to also be able to produce
MMP-8\(^8\). MMP-8 is the most prevalent MMP found
in diseased periodontal tissue and GCF. Nomura et al.
found no difference in MMP-8 levels from patients with
periodontal disease when compared to patients with
gingivitis. From this early investigation, it was believed
that MMP-8 may serve as a proinflammatory marker, but
not as a discriminating marker for chronic periodontitis
and gingivitis. However, Mancini and co-workers found
an 18-fold increase of MMP-8 in patients experiencing
active periodontal tissue breakdown as compared with
patients under stable conditions. Conclusions from
this investigation indicated the potential use of MMP-
8 as a screening test for detection of active disease
progression\(^9\). Elevated MMP-8 levels in active disease
progression were observed by Lee et al. in a longitudinal
study using patients with gingivitis, nonprogressive,
and progressive periodontitis. The total collagenase
activity was observed to be 50% higher in the disease
progression group. Golub et al. introduced a 20-mg
low-dose doxycycline (LDD) capsule, which preserved
its proteinase-inhibitory ability to suppress connective
tissue breakdown, but without antibiotic/ antimicrobial
capabilities. The group went on to conduct several
studies demonstrating that LDD can function as an MMP
by way of suppressing the collagenase activity in GCF
and gingival tissues of patients with adult periodontitis.
To test the hypothesis that LDD could lower GCF levels
of bone-type collagen fragments, clinical parameters
(gingival inflammation, pocket depth, and radiographic
evidence of bone loss) that predicted excessive MMP
activity in periodontal pockets of 18 adult patients were
evaluated. All patients received supragingival scaling 1
month before the baseline appointment. At the baseline
visit and at the subsequent 1- and 2-month visits, GCF
samples were collected. Conventional clinical measures
(gingival index, plaque index, probing depth, and
attachment level) were taken at each time point in the
study. Western blots analyses determined that neutrophil-
type collagenase (MMP-8) was increased in disease and
substantially reduced by approximately 60% during the
2-month protocol of LDD\(^9\). MMP-8 may have some
future value as a diagnostic marker for periodontal
disease, an indicator for disease progression, and as a
signal to determine the efficacy of treatment.
MMP-8 has also been detected in elevated amounts in peri-implant sulcular fluid (PISF) from peri-implantitis lesions. Teronen et al. identified higher collagenase-2 levels in failing dental implants compared to nonmobile implants. Ma et al. went on to explore for the presence of MMP-8 and collagenase-3, MMP-13, in peri-implant sulcus fluid. Forty-nine randomly selected dental implant sites in 13 patients were studied. Implants were categorized into three groups according to the amount of bone loss in the vertical dimension: <1 mm, from 1 to 3 mm, or >3 mm. Results from this investigation showed that both MMP-8 and MMP-13 levels were significantly higher in the >3 mm bone loss group when compared to the groups that had less bone loss11. Additional studies were conducted by Kivela-Rajamäki et al., looking at MMP-8 levels in combination with laminin-5 and, during a separate study, with MMP-7. Conclusions drawn from both investigations indicate that elevated levels of MMP-8 can be seen in diseased PISF as compared to healthy PISF12. Collectively, these findings offer hope for the use of MMP-8 as a marker for active phase of peri-implant disease. Longitudinal studies are required to evaluate MMP-8 either alone or in conjunction with other molecular biomarkers to predict the risk of future disease occurrence and to monitor treatment interventions.

Conflict of Interest: Nill

Source of Funding: Nill

Ethical Clearance: Not needed – review article

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**Abstract**

For the fabrication of dental inlays and crowns precise information on tooth morphology is required. Besides the conventional method, the use of digital scanners has become an central part of impression making in dentistry. Intraoral scanners (IOS) are devices for capturing direct optical impressions. The purpose of this narrative review on the use of IOS was to discuss: (1) commercially available scanners, (2) the indications and contraindication, (3) precision of the digital impression compared to the conventional methods; (4) the advantages/limitations of using optical impressions.

**Keywords**: Zirconia, Impression, CAD/CAM, Implants.

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**Introduction**

The abbreviation “CAD/CAM” denotes computer-aided design and computer-aided manufacturing(1950). This technology enables modelling, design, and manufacture of objects. The use of CAD/CAM in dentistry has been used since the 1980s to produce inlay and onlay fillings, crowns, laminates, fixed dental prostheses (FDPs), and implants, and is increasingly used by dentists and technicians.

In the CAD/CAM system, digital impressions are recorded by intraoral scanner, which resembles an ordinary camera, collects information about projecting light. Reproducible tissues are shown on the hardware display as natural looking.

The main structures of the prosthetic design in terms of data are 3D in the prepared teeth, the adjacent teeth, and the occlusion with the opposing bite.

The intraoral scanner measures the light reflection times of the surface to be recorded. The description, based on data and calculation algorithms to copy the software, calculates and generates a computer screen image of the prepared area.

Intraoral cameras use video technique or still photo technique for scanning. Still images are based on triangulation or parallel confocal laser scanning. Systems take several still images from which a 3D image can be formed.

**CAD-CAM SYSTEMS**

LAVA C.O.S and Lava True Definition scanner use active wavefront sampling for data collection from which video image is formed.

CEREC AC Bluecam uses active triangulation and optical microscopy to produce still images.

The CEREC AC Omnicam CAD/CAM system uses video for data collection.

iTero and 3Shape Trios use the parallel confocal method to produce digital data.

**INDICATIONS**

Zirconia Coping

Single tooth restorations in lithium disilicate,
zirconia, all ceramics
Frameworks and Fixed Partial Dentures in Zirconia
Single Implant Crowns
Implant bridge
Implant-Supported bars
Digital smile design
Obturators
Guided implant surgery

CONTRAINDICATIONS
Long span fixed partial dentures and/or fixed full arches
Long span implant supported fixed partial dentures
Complete removable prosthesis

Are optical impressions as accurate as conventional impressions?

The main feature an IOS should have is accuracy: a scanner should be able to detect an accurate impression for a better treatment outcome.

In metrics and engineering, accuracy is defined as the ‘closeness of agreement between a measured quantity value and a true quantity value of a measurand’. Ultimately, accuracy is the sum of trueness and precision.

The two factors that influence the accuracy are: trueness, which describes the deviation of the impression geometry from the original geometry, and precision, which describes the deviation between repeated impressions rather than to the original geometry.

All ceramic single crowns
Zarauz et al conducted an in vivo study to evaluate the marginal fit of crowns based on conventional silicone impressions and digital iTero impressions. To evaluate the precision of crowns fabricated using conventional and digital impression systems, 26 crowns were made on each technique and cemented on their corresponding clinical preparation. Means of the internal misfit and marginal misfit were measured using stereomicroscopy of 2-mm-thick slices in a buccolingual orientation. Results of the digital impression were more accurate. Based on this, digital impression system and CAD/CAM technology can improve the marginal adaptation of all-ceramic single crowns.

FOUR UNIT FIXED ZIRCONIA FPD
Almeida e Silva et al conducted an in vitro study to evaluate the marginal and internal fit of four-unit fixed zirconia FDPs using both digital and conventional impression techniques. They found no statistical differences between the Lava C.O.S. digital impression group and the conventional impression group, using Impregum, although impressions made by the CAD/CAM system resulted in better marginal and considerable internal fit at the premolar mesial and molar distal faces.

IMPLANTED SUPPORTED CROWNS AND FPDs
An in vitro study by Abdel-Azim et al discovered the influence of computer-aided impression options on the accuracy of dental implant-based single units and complete arch frameworks. They reported that conventional impressions resulted in a smaller marginal discrepancy when compared to the digital methods for a single-implant framework. For single implants the mean marginal gap was 24.1 μm for conventional impressions compared to 61.4 μm for digital impressions.

Additionally, Lee et al conducted an in vitro study to compare the accuracy of implant impressions made with digitally manufactured models vs. gypsum models vs. CAD/CAM system models. The digital impressions were made with the iTero system and the conventional close-tray impressions with a VPS material. Gypsum models represented more details in grooves and fossae compared to CAD/CAM models. According this study, milled models based on digital impressions were comparable to gypsum models based on Conventional impression.

Full Arch FPDs
Ender and Mehl published an in vitro study on the accuracy of conventional and digital impression methods used in full-arch dental impressions. Four digital impression systems (CEREC Bluecam, CEREC AC Omnicam, iTero, Lava C.O.S.) and four conventional impression materials were used. A highly accurate reference scanner was used to evaluate the accuracy for
both full-arch conventional and digital impressions of the same dental morphology. The results showed that the highest trueness and precision was measured for CEREC Bluecam, vinylsiloxanether, and direct scannable vinylsiloxanether. The local deviations of the full arch impression were higher in digital impression when compared to the conventional methods. Ender and Mehl investigated the accuracy of the full arch impressions recorded by digital and conventional methods using a new reference scanner. In this in vitro study trueness and precision were evaluated from five conventional impressions with a vinyl siloxanether impression material and from five digital impressions of the reference model made with the CEREC AC Omnicam. The results showed that the trueness and the precision of the digital complete-arch impression were comparatively less accurate than those of the conventional impressions. The deviation patterns of conventional and digital impressions were also different.1,3,4

The advantages and limitation of optical impressions with respect to conventional physical impressions

**ADVANTAGES**

**LESS PATIENT DISCOMFORT**

The conventional method are subjected to cause momentary discomfort for the patient due to the inconvenience and hardship stemming from the materials positioned on impression trays. Some patients with strong gag reflex, children or non-cooperative individuals, find it hard to tolerate the classic procedure. For such patients, replacing conventional impression materials with light is an advantage; optical impression is therefore appreciated and encouraged.

**Time efficiency and better communication with the dental technician**

Several studies have shown that optical impressions are time-efficient, as they enable reduce the working times when compared to conventional methods. Pouring of stone cast is not need in digital methods; the recorded digital impression can be sent through an e-mail as a 3 Dimensional virtual models (proprietary or STL files) directly to the dental laboratory without the need to deliver anything via courier or regular mail. This saves considerable amount of time. Moreover, if the clinician is not satisfied with some of the details of the recorded optical impression, they can be deleted and recorded again without having to repeat the entire procedure.

**No more plaster casts**

The digital impression allows the skipping of pouring models and casts. The elimination of conventional impression materials translates into direct savings for the clinician, with reduced consumables costs.

**Better communication with patients**

Optical impression is one of the vital tool for patient communication and marketing. With optical impressions, patients feel more involved in their treatment and it is possible to establish more effective communication with them; this emotional involvement may have a positive impact on the overall treatment, for example, by improving patient compliance to oral hygiene.2,5

**Disadvantages**

**Difficulty detecting deep margin lines of prepared Teeth**

One of the most frequent problems encountered with intra oral scanner is difficulty in detecting deep marginal lines on prepared teeth or in the case of bleeding. In aesthetic areas where it is important for the clinician to place the prosthetic margins subgingivally, it may be more difficult for the light to correctly detect the entire finishing line. Unlike the conventional impression materials, light cannot physically detach the gum and therefore cannot register ‘non-visible’ areas. In the event of bleeding, as blood obscures the prosthetic margins, it is difficult to record the marginal lines. With the help of retraction cords and proper oral hygiene, it is possible for the clinician to detect a good optical impression even in difficult contexts.

**Purchasing and managing costs**

Over the last few years, manufacturers have released many new models on the market, and the growth in supply should be accompanied by a reduction in purchase costs. One important consideration is the additional managing costs related to software upgrades. Different manufacturing companies have different policies in this regard, and it is important for the clinician to be fully informed of the annual management costs and fees, where present, before purchasing an IOS. Finally, in the case of ‘closed’ systems, or with IOS that output
only proprietary file formats, an annual or monthly fee may be required to ‘unlock’ the files and render them usable by any CAD software or any laboratory. Once again, the clinician should be properly informed about these additional managing costs.\textsuperscript{2,5}

**Conclusion**

Optical impression are time-efficient, reduces patient discomfort and simplify clinical procedures for the dentist, eliminating plaster models and allowing better communication with the dental technician and with patients; however, it can be difficult to detect deep margin lines in prepared teeth and/or in case of bleeding and there are purchasing and managing costs. The current IOS are sufficiently accurate for capturing impressions for fabricating a whole series of prosthetic restorations (inlays/onlays, copings and frameworks, single crowns and fixed partial dentures) on both natural teeth and implants; in addition, they can be used for smile design, and to fabricate posts and cores, removable partial prostheses and obturators. The Digital impression techniques are a clinically acceptable alternative to conventional impression methods in fabrication of crowns and short FDPs. For fabrication of implant-supported crowns and FDPs, digital impression systems also result in clinically acceptable fit. Conventional and digital impression methods differ significantly in the complete-arch accuracy. Based on the evaluation of studies, the conventional impression technique is still recommended for full-arch impressions when compared to the digital impression technique.

**Ethical Clearance** – Not needed as it is a review article

**Source of Funding** – Nil

**Conflict of Interest** – Nil

**References**


Oral Lichen Planus- Treatment Planning

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Abstract

Lichen planus, a chronic autoimmune disease, affects the skin and mucous membrane. It is believed to represent an abnormal immune response in which epithelial cells are recognized as foreign, secondary to changes in the antigenicity of the cell surface. It is characterized by alternating periods of symptomatic remission and exacerbation. It has various oral manifestations, the reticular form being the most common. The erosive and atrophic forms of OLP are less common, yet are most likely to cause symptoms. Different treatment modalities have been tried with limited success. Topical corticosteroids constitute the mainstay of treatment for symptomatic lesions of OLP. Recalcitrant lesions can be treated with systemic steroids or other systemic medications. However, there is only weak evidence that these treatments are superior to placebo. The main objective of this paper is to review the current literature regarding the treatment of OLP.

Keywords: OLP, Malignant transformation, Differential diagnosis, corticosteroids, Immuno-modulators, Management

Introduction

Oral lichen planus (OLP) is a chronic autoimmune, mucocutaneous disease of unknown origin. It was first described by Wilson in 1869. It can affect the oral mucosa, skin, genital mucosa, scalp, and nails. Globally, Lichen planus affects about 1-2% of population and prevalence in India ranges from 0.1% to 1.5%.[4] This disease has most often reported in middle-aged patients 30-60 years of age and is more common in females than in males (1.4:1). Rarely, OLP is seen in children.[1] Although the exact etiology of lichen planus is unknown, an immune-mediated pathogenesis is recognized.[1] A meta-analysis of primarily case-control studies conducted in multiple countries found a statistically significant association between hepatitis C virus (HCV) infection and lichen planus,[8] although there is no known explanation for this association.[2]

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Pathophysiology

It is believed that the disease is caused by an abnormal cell-mediated immune response of both T4 and T8 lymphocytes in the basal epithelial cells.4 Autocytotoxic CD8 + T-cells activate apoptosis of oral epithelial cells. The CD8 + cytotoxic cells trigger the keratinocyte apoptosis through activation of the cells by an antigen associated with major histocompatibility Class I on basal keratinocytes.[1] The chronic course of OLP may result from the activation of the inflammatory mediator nuclear factor kappa B, and the transforming growth factor control pathway may cause keratinocyte hyper proliferation that leads to the white lesion.4 OLP may be associated with many systemic diseases, few have been confirmed, but infection with hepatitis C virus (HCV) can produce lichen planus.Carrozzo et al. have demonstrated a strong association between HCV infection and OLP. However, the association between OLP and HCV appears to be dependent on geographical heterogeneity.Moravvej et al. in 2007 found an association between Helicobacter pylori infection and lichen planus patients. However, an etiologic role of H. pylori in lichen planus is not yet properly established.[1]
CLINICAL PRESENTATION:

Six clinical forms of OLP have been described which are white forms namely reticular, papular, plaque-like and red forms namely the erosive (ulcerated), atrophic (erythematous) and bullous. Among the types, reticular and erosive are the main types.[3] Lichen planus lesions are described using the six P’s (table 1).[2]

The classic skin lesions of the cutaneous form of lichen planus can be described as purplish, polygonal, planar, pruritic papules and plaques. These skin lesions commonly involve the flexor surfaces of the legs and arms, especially the wrists. The nail beds may also be affected, with resultant ridging, thinning and subungual hyperkeratosis. Scalp involvement, if untreated, can lead to scarring and permanent hair loss.[4]

These lesions are often covered by lacy, reticular, white lines known as Wickham striae. The lesions may appear in a linear configuration, following the lines of trauma (Koebner phenomenon). It is common to see postinflammatory hyperpigmentation as the cutaneous lesions clear.[2]

OLP and may represent the gingival manifestation of many other diseases such as cicatrical pemphigoid, pemphigus vulgaris, epidermolysis bullosa acquisita, and linear IgA disease. Patients with reticular lesions are often asymptomatic, but atrophic (erythematous) or erosive (ulcerative) OLP is often associated with a burning sensation and pain. A greater malignant potential has been recognized for atrophic, erosive form of OLP and the plaques form on the back of the tongue. A regular follow-up of patients with OLP should be performed and in suspected cases, biopsy should be provided.[3]

Histopathological Features:

The classic histopathologic features of OLP include liquefactive degeneration of the basal cell accompanied by apoptosis of the keratinocytes, a dense band-like lymphocytic infiltrate [Figure 1] at the interface between the epithelium and the connective tissue, focal areas of hyperkeratinized epithelium (which give rise to the clinically apparent Wickham’s striae) and occasional areas of atrophic epithelium where the rete pegs may be shortened and pointed (a characteristic known as saw tooth rete pegs). Eosinophilic colloid bodies (Civatte bodies), which represent degenerating keratinocytes, are often visible in the lower half of the surface epithelium. [4]

Degeneration of the basal keratinocytes and disruption of the anchoring elements of the epithelial BM and basal keratinocytes (e.g. hemidesmosomes, filaments, fibrils) weaken the epithelial connective tissue interface. As a result, histologic clefts (Max-Joseph spaces) may form and blisters on the oral mucosa (bullous LP) may be seen at clinical examination. B cells and plasma cells are uncommon findings.[5]

Differential Diagnosis:

The differential diagnosis of erosive OLP includes squamous cell carcinoma, discoid lupus erythematosus, chronic candidiasis, benign mucous membrane pemphigoid, pemphigus vulgaris, chronic cheek chewing, lichenoid reaction to dental amalgam or drugs, graft-versus-host disease (GVHD), hypersensitivity mucositis and erythema multiforme. The plaque form of reticular OLP can resemble oral leukoplakia.[6]

Management:

Drug therapy is the most common method for treatment of OLP. Different drugs have been used for treatment of OLP including immunosuppressives, retinoids, and immunomodulators. Drugs are used in two

Table 1: The Six P’s to Describe Lichen Planus Lesions

<table>
<thead>
<tr>
<th>Planar (flat topped)</th>
<th>Purple</th>
<th>Polygonal</th>
<th>Pruritis</th>
<th>Papules</th>
<th>Plaques</th>
</tr>
</thead>
</table>

[Figure 1]
forms, topical or/and systemic.\(^\text{[7]}\) Since none of the available treatment is specific or universally successful and may have adverse effects, active therapy is largely reserved for erosive and ulcerative OLP or non-erosive symptomatic lesions. A wide list of medications (Table 2) have been advocated but few have been subjected to adequate placebo-controlled trials.\(^\text{[8]}\)

<table>
<thead>
<tr>
<th><strong>Table 2: Principle Treatment Modalities for OLP</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CORTICOSTEROIDS</strong></td>
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<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Topical</td>
</tr>
<tr>
<td>Betamethasone phosphate</td>
</tr>
<tr>
<td>Betamethasone valerate</td>
</tr>
<tr>
<td>Clobetasolpropionate</td>
</tr>
<tr>
<td>Flucinoloneacetonide</td>
</tr>
<tr>
<td>Flucinonide</td>
</tr>
<tr>
<td>Hydrocortisone Hemsuccinate</td>
</tr>
<tr>
<td>TraimcinoleAcetonide</td>
</tr>
<tr>
<td>Systemic</td>
</tr>
<tr>
<td>Prednisolone</td>
</tr>
<tr>
<td>Methyl prednisolone</td>
</tr>
<tr>
<td>RETINOIDS</td>
</tr>
<tr>
<td>Topical</td>
</tr>
<tr>
<td>Fenretinide</td>
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<tr>
<td>Isotetoin</td>
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<tr>
<td>Tretinoin</td>
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<tr>
<td>Systemic</td>
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<tr>
<td>Acitretin</td>
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<tr>
<td>Etretinate</td>
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<tr>
<td>Isotretinoin</td>
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<tr>
<td>Temarotene</td>
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<tr>
<td>Tretinoin</td>
</tr>
</tbody>
</table>

**Corticosteroids:**

Topical corticosteroids are the mainstay in treating mild to moderately symptomatic lesions. Options (presented in terms of decreasing potency) include 0.05% clobetasol propionate gel, 0.1% or 0.05% betamethasone valerate gel, 0.05% fluocinonide gel, 0.05% clobetasol butyrate ointment or cream, and 0.1% triamcinolone acetonide ointment. In patients
with widespread symptomatic lesions, in whom direct mucosal application of topical medication would be too uncomfortable, options include 1.0 mg/mL aqueous triamcinolone acetonide or 0.1 mg/mL dexamethasone elixir. IntraleSIONaL injection of corticosteroid for recalcitrant or extensive lesions involves the subcutaneous injection of 0.2–0.4 mL of a 10 mg/mL solution of triamcinolone acetonide by means of a 1.0-mL 23- or 25-gauge tuberculin syringe. The advantage of topical steroid application is that side effects are fewer than with systemic administration. Systemic corticosteroids are probably the most effective treatment modality for patients with diffuse erosive OLP doses of 1.5–2 mg/kg/daily, but adverse effects are possible even with short courses.\(^3\)

**Retinoids:**

Retinoids are metabolites of vitamin A. They have been noted to have anti-keratinizing and immunomodulating effects. Retinaldehyde 0.1\(^{36}\), isotretinoin gel 0.1% have been tried in OLP and they showed good clinical efficacy. OLP has been treated with fenretinide and tazarotene gel 0.1% successfully. These studies suggested that topical retinoid might be a suitable therapeutic agent in the treatment of hyperkeratotic OLP.\(^3\)

**Immunosuppressive Agents:**

**Azathioprine** (75–150 mg d\(^{-1}\)) may be a successful steroid-sparing adjunct to systemic prednisone therapy (Lozada, 1981) and as monotherapy may provide an alternative choice if there are risk factors against steroid use (Lear and English, 1996). However, azathioprine may induce bone marrow suppression especially in heterozygotes for high activity of the enzyme thiopurine methyltransferase (Snow and Gibson, 1995).

**Systemic cyclosporine** (6 mg/kg day) a non-myelotoxic immunosuppressant, is effective in controlling severe cutaneous LP (Ho et al, 1990). Cyclosporine induces in LP a substantial decrease of T cells and a corresponding reduction in activated CD25-positive cells and in antigen presenting cells possibly by inhibition of interferon \(\gamma\) production (Shiohara et al, 1988; Mozzanica et al, 1991). The adverse side effects of cyclosporine (most importantly, renal dysfunction) and the chronicity of the oral lesions have dissuaded clinicians from prescribing it in systemic treatment for OLP. Mouth rinses (450–1500 mg d\(^{-1}\) for 8–12 weeks) and finger applications of base solution (100 mg/day for 4 weeks) or cellulose-base preparation of cyclosporine (48 mg/day for 8 weeks) produce significant improvement in OLP, with no reliable side effects and little systemic absorption.\(^8\)

**Tacrolimus** is a macrolide immunosuppressant with a mechanism of action similar to that of cyclosporine, but is 10 to 100 times more potent and is better able to penetrate the mucosal surface. Treatment with topical tacrolimus 0.1% ointment four times daily induced a better initial therapeutic response than triamcinolone acetonide 0.1% ointment in patients with symptomatic OLP.\(^3\)

**Pimecrolimus (PI)** is a semi-synthetic product of ascomycin. Pimecrolimus has a similar mode of action to that of tacrolimus interacting with macrophilin-12 and inhibiting T-cell stimulation blocking both Th1 (IL-12, IFN-\(\gamma\), and TNF-\(\alpha\)) and Th2 cytokines (IL-4 and 10) but is more selective having no effect on Langerhans cells. PI is a weaker immunosuppressant than cyclosporine or tacrolimus, and it has lower permeation through the skin than topical corticosteroids or topical tacrolimus.\(^9\)

**Others:**

**Amphotericin** (a broad-spectrum antimycotic), when administered to patients with OLP and positive Candida cultures, resulted in a 94% clinical improvement (Lundstrom et al, 1984). A recent controlled trial suggests however that anti-Candida therapy plays a marginal role if any in the management of OLP (Carbone et al, 1999).

**Dapsone** occasionally helpful (Falk et al, 1985; Beck and Brandrup, 1986) mainly in patients with desquamative gingivitis (Matthews et al, 1989), but it has several adverse effects which may outweigh any likely moderate benefit.

**Levamisole** (150 mg d\(^{-1}\) for 6 weeks) may be best used as adjuvant medication during systemic steroid treatment (Shin-Yu et al, 1995) rather than as monotherapy (Sharps, 1978; Sun et al, 1994), and the side effects of levamisole preclude its routine use (Sharps, 1978).

**Systemic doxycycline** (200 mg d\(^{-1}\)) may improve desquamative gingivitis in OLP (Ronbeck et al, 1990) but not invariably (Eisen, 1994).
Hydroxychloroquine sulphate (an antimalarial agent) (200–400 mg d−1) has been recently reported to be useful in the treatment of OLP in a preliminary trial (Eisen, 1993), mainly in combination with topical steroids, because the effect of both agents appear to be additive.

Interferon - A pilot study had suggested that a topically applied gel preparation containing human fibroblast interferon (HuIFN-beta) may significantly improve erosive OLP (Sato et al, 1985). Systemic interferon-alpha (3–10 million IU thrice weekly) may be used to successfully treat OLP in patients with and without HCV infection (Doutre et al, 1992; Hildebrand et al, 1995). Despite these success rates, interferon has been reported to trigger or to worsen LP lesions (Protzer et al, 1993; Nagao et al, 1996a) and antibodies to interferon-gamma have been shown to abrogate experimentally-induced lichenoid reactions (Shiohara et al, 1988). Hence, there is equivocal evidence that expensive interferon therapy is a useful modality of treatment of OLP; indeed, it has been suggested that antibodies to this cytokine may be helpful (Walsh et al, 1990)

Glycyrrhizin- A recent small trial involving OLP patients with chronic HCV infection suggests than glycyrrhizin (an active component of liquorice roots) may also be useful in treating OLP (Nagao et al, 1996b).

Amitriptyline (Amy), a tricyclic antidepressant, has local anesthetic properties and seems to be more potent and safer than bupivacaine. Based on the topical anesthetic properties of Amy, a recent poor-quality randomized clinical trial compared a new mouthwash containing clobetasol, ketoconazole, and Amy with dexamethasone tablet, nystatin drop and diphenhydramine syrup. The new treatment worked better and was better accepted by the patients with OLP.

Amlexanox(C16H14N2O4) is a topical anti-inflammatory drug that has been developed as an oral paste (containing 5% amlexanox) for the treatment of patients with recurrent aphthous ulceration. Amlexanox can inhibit the formation and release of histamine, TNF-alpha, and leukotrienes from mast cells, neutrophils, and mononuclear cells, possibly through increasing intracellular cyclic adenosine monophosphate content in inflammatory cells.

Aloe vera (AV) is a cactus-like plant that belongs to the Liliaceae family. The pharmacological actions of AV include anti-inflammatory, antibacterial, antiviral and antifungal properties, and hypoglycemic effects. According to a Cochrane review, there is a weak evidence from two placebo-controlled RCTs, using different formulations, that AV may be associated with a reduction in pain in OLP. The amount of active drug substance in AV varies depending also on the age of the plant, the growing and harvesting conditions, the parts of the plant, and the extraction methods used.

Bacillus Calmette–Guerin polysaccharide nucleic acid (BCG-PSN)- A randomized comparative study employing intralesional injections of bacillus Calmette–Guerin polysaccharide nucleic acid (BCG-PSN) (0.5 ml every other day for 2 weeks) and triamcinolone acetonide (10 mg intralesional injection once a week for 2 weeks) showed similar effectiveness.

Curcuminoids have been well known as the major components in turmeric and used as the anti-inflammatory agents for a long time. Two RCTs on OLP have been published. The first study, comparing low doses of curcuminoids (2000 mg/day for 7 weeks) and prednisolone (60 mg/day for 1 week) with prednisolone alone, was withdrawn at the first interim analysis for futility. The second one employing higher doses (6000 mg/ day) showed some benefit particularly during the follow-up.

Hyaluronic acid (HA) is a linear polymer of glucuronic acid, N-acetylglucosamine disaccharide. The main function of HA appears to be in tissue healing, and a variety of mechanisms have been identified. A recent RCT evaluates the efficacy of a topical HA gel preparation (0.2%) in the management of OLP. HA (0.2%) caused just a very transient improvement in patients with OLP.

Lycopene (Ly) is a red-colored carotenoid predominantly accumulated in tomatoes as well as in other fruits and vegetables. Ly has shown some beneficial effects in the treatment of oral cancer, leukoplakia, and oral submucous fibrosis. A recent randomized, double-blind, placebo-controlled study found Ly (8 mg/day) helpful in reducing OLP symptoms.

Thalidomide has the anti-inflammatory and anti-immunologic properties of suppressing T-cell function. Because of its ability to decrease production of TNF-
alpha, thalidomide has been used in the treatment of oral disorders likely to be TNF-alpha driven such as aphthous stomatitis. Their anti-angiogenesis, anti-inflammatory, immune-modulatory properties of thalidomide could be applied in clinical use for the treatment of erosive OLP.[9]

**Surgery** - Surgical excision, cryotherapy, CO2 laser, and ND:YAG laser have all been used in the treatment of OLP. In general, surgery is reserved to remove high-risk dysplastic areas.[3]

**Conclusion**

OLP is considered a lesion with a low risk of malignant transformation to squamous cell carcinoma of the oral cavity, which rates among the ten most common cancers in the world. The five year survival rate of oral cancer is still being less than 50 %, however, oral cancer can be cured, if detected and treated early enough. Therefore, one should emphasize the importance of an early diagnosis of potentially malignant oral lesions; including OLP. A complete clinical evaluation includes a review of any medications that may be a cause of the disease. An overall assessment of the patient’s nutritional and emotional status as well as the elimination of precipitating factors, including traumatic habits and damaged dental restorations, is warranted. These may seem trivial and may rarely be relevant; however, any benefits achieved are significant when compared with a lifelong commitment to topical and systemic medications. Care should be taken when informing patients about these issues to avoid excessive worry that would only worsen the clinical picture.

**Ethical Clearance** – Not needed as it is a case report

**Source of Funding** – Nil

**Conflict of Interest** - Nil

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Titanium Casting for Removable Partial Denture

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Abstract

Titanium is an ideal material for use in Prosthodontics mainly due to improvement of techniques for casting titanium and its alloys. To expand the applications of Titanium alloys as dental prosthodontic materials, TiZr Alloy and TAMZ alloy are developed and to improve the physical and mechanical properties of removable partial denture castings. The purpose of this review is to prove that Titanium can be used for casting RPD frameworks because of its excellent mechanical, physical and chemical properties.

Key words – Titanium casting, RPD.

Introduction

Titanium was discovered in England by William Gregor in 1791 and is named by Martin Heinrich Klaproth for the Titans of Greek Mythology. Titanium is a chemical with the symbol “Ti” and atomic number 22. (fig.1). Titanium is a light, strong, lustrous, naturally corrosion resistant, transition metal with a grayish color. (fig.2). Many of Titanium’s physical and mechanical properties make it desirable to be used as Implants and Prostheses. Commercially pure titanium is used for dental implants, surface coating, crown, Removable Partial Denture, Complete Denture and Orthodontic wires.[¹, ²]

CASTING OF TITANIUM RPD FRAMEWORKS

Casting of Partial Denture frameworks were made using Titanium with 13%Cu and 4.5%Ni. Widely used Titanium alloy is Ti-6Al-4V alpha-beta alloy. The only Titanium alloy indicated for casting RPD frameworks is Ti-6Al-7Nb alloy which is developed by Sulzer Brothers Ltd., a Swiss Company.[³, ⁴] (fig.3 & 4)

EVOLUTION OF TITANIUM CASTING

In 1977, as suggested by Beder and Ploger, experimental castings of Titanium for removable partial denture were made by induction melting in vacuum. (fig.5) Waterstat and his associates’ casted dental prosthesis with Titanium alloy containing 13wt%Cu and 4.5wt% Ni. In 1985, Waterstat’s idea of using split chamber argon vacuum arc casting equipment for titanium casting with magnesia instrument was presented. Later, Waterstat along with Mueller et al was involved in the examination of the properties of commercially available investment materials for Titanium at American Dental Association, Chicago. In 1984, Greener and his colleagues at Northwestern University conducted a research to develop titanium alloys with corrosion resistance, biocompatibility and low fusion temperature. In 1985, Greener et al examined the capabilities of two commercial titanium casting machines acquired from Japan, the “TITANIUMER” by Ohara and the “CASTMATIC” by Iwatani. (fig.6) In 1989, Blackman et al presented 90% success rate for a cast titanium removable partial denture pattern based on observation of voids, peripheral irregularities etc., In 1990, Jelenko developed titanium casting equipment called TiCast3000 which uses a helium arc melting or centrifugal rotating system. In 1991, Tamaki
et al examined the effect of two commercial investment materials on the casting accuracy of pure titanium using different types of crucibles.

In a collaborative study at University of Texas by Sutton et al, the porosity of commercially pure titanium removable partial denture frameworks were compared among 5 different sprue designs using digital image analysis of radiographs. Watanabe et al reported on initial work using a NIOM-Baylor experimental pressure difference casting unit to find the optimal operating conditions for producing commercially pure titanium castings. Gilbert and Mante conducted a comparative electrochemical study on high purity polycrystalline and single crystal titanium. In 2001, Kyung Soo Jang and his coworkers compared the castability and surface roughness of commercially pure titanium and cobalt chromium denture framework using visual, radiographic and microscopic methods to find out that the results were qualitatively similar with surface roughness of titanium at 104.43 ± 69.24nm and cobalt-chromium at 133.91 ± 40.92nm. In 2002, Bert.T.Cecconi and Mark.L.Cecconi evaluated radiographically the castability of Titanium removable partial denture framework were technically acceptable for clinical use.

Benefits

Most of Titanium’s chemical, biological and mechanical properties make it desirable as a material for prosthesis.

- Titanium is highly biocompatible due to existence of titanium oxide layers on the metal surface.
- Titanium is relatively inert and has excellent corrosion resistance due to formation of an adherent and highly protective oxide film.
- Titanium is one of the best metals that allows for osseointegration.
- Titanium has greater flexibility and has better accuracy of fit.
- Titanium is a thermodynamically reactive metal.
- Titanium has a tensile strength of between 30,000 and 200,000 lbs. per square inch.
- Titanium alloy contains 6wt% Al and 4wt% V, which doubles its tensile strength relative to commercially pure titanium.
- Titanium has a Yield strength of 170-480MPa and Ultimate strength of 240-550MPa but it is lighter and has low density.
- Titanium is highly stable due to high strength to weight ratio.
- Titanium has a good shape memory effect as it has the ability to recover large strains and dissipate mechanical work without deformation.
- Titanium has non ferromagnetic property so that it can be safely examined with MRI.[6, 7]

Drawbacks

- Lengthy burnout
- Inferior castability and machinability
- Reaction layer formed on cast surface
- Difficulty of polishing
- High initial cost
- Discoloration of titanium surface
- Unpleasant metal taste
- Detachment of denture base resin
- Tendency of plaque adherence to titanium surface[8,9,10]

![Fig.1 - Titanium with the symbol “Ti”](image1)

![Fig.2 – Titanium - corrosion resistant, transition metal](image2)
Fig.3 - Titanium - RPD frameworks

Fig.4 - Titanium alloy indicated for casting RPD

Fig.5 - Removable partial denture were made by induction melting in vacuum

Fig.6 - Titanium casting machines

Conclusion

Titanium and titanium alloys based on their physical, biological, mechanical properties appear to be suitable for constructing RPD frameworks. Use of titanium is ideal in patients who report a history of allergies to conventional metal alloys. With the advent of technology, it has become less cumbersome to fabricate and machine Titanium. Therefore, it can be assumed as a viable alternative to other conventional metals for casting RPD framework.

Ethical Clearance – Not needed as it is a review article

Source of Funding – Nil

Conflict of Interest – Nil

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Non-Lobular Capillary Haemangioma - A Histopathological Variant of Pyogenic Granuloma

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Abstract

Pyogenic granuloma is a non neoplastic growth which most commonly seen in the oral cavity. It is a misnomer because the lesion is unrelated to infection and in reality arises in response to various stimuli such as low-grade local irritation, traumatic injury or hormonal factors. This is predominantly seen in the second decade of life. This pyogenic granuloma is also classified under a group of vascular lesion called lobular capillary haemangioma. Here we present a case of a lingual growth from the alveolar mucosa of a young patient which has been provisionally diagnosed as pyogenic granuloma. Later diagnosed as Non lobular capillary haemangioma (LCH) and lesion was excised and follow up was done with no recurrences.

Key words: Non Lobular capillary haemangioma (NLCH) Inflammatory hyperplasia, oral cavity, pregnancy tumor, pyogenic granuloma

Introduction

Pyogenic granuloma is a misnomer, which does not produce a purulent secretion. It was described by Hullihens in 1844, and 1897 by Poncet and Dor. Initially it was called as botryomycosis hominis and latter reffered as granuloma pediculatum, benignum, benign vascular tumor, pregnancy tumor, vascular epulis, crocker hartzell’s disease. It beleived that 1903 croker and 1904 Hartzell introduced the current term and histopathologically it has been termed as haemangiomatosus granuloma by Angelopoulos and cawson suggested granuloma telangecticum due to its higher vascularity. Nowadays it has been termed as Non lobular capillary haemangima and non lobular capillary haemangioma by its varying histology [1][2]

In this article we discuss a case of unusual presentation of pyogenic granuloma histopathologically.

Case report

The young male patient of age 16 came with a complaint of a swelling in the lower left lingual region for the past few months. On intra oral examination a sessile growth of size (3x2x2) cm which increases gradually for the past few months and attained the current size (figure 1 & 2). It was painless and non tender. The surface were smooth and intendeted and non fixed with intact overlying mucosa. The growth is firm and resilient. No bleeding on provocation. The growth is non fluctuant. With a differential diagnosis of pyogenic granuloma, haemangioma, irritational fibroma, peripheral ossifying fibroma, peripheral giant cell granuloma and Epulis. After a routine hematological investigation showing normal values. The lesion was excised and processed for the histopathological diagnosis. The given Haematoxylin Eosin stained shows a para keratinised startifed squamous epithelium with a moderately collagenous connective tissue stroma (figure 3). The vascularity is high with large and varying shaped vascular channels lined by endothelial cells, the endothelium shows increased in thickness of endothelial proliferation. The stroma also shows diffuse infiltration of chronic inflammatory cells.
predominately of lymphocytes. Extravasated RBC are seen (figure 4 & 5). Suggestive of on lobular capillary haemangioma.

**Figure 1 - Intraoral swelling – sessile growth of size (3x2x2) cm in lingual aspect**

**Figure 2 - Intraoral swelling – Lingual aspect**

**Figure 3 (scanner view) - Showing parakeratinized stratified squamous epithelium with underlying connective tissue stroma.**

**Figure 4 (10x view) - Showing numerous vascular channels lined by endothelium**

**Figure 5 (High power view) - Showing increased thickness of the endothelium**

**Discussion**

The pyogenic granuloma has a higher incidence of female predilection. It is a most common gingival tumour with between 26.8% and 32% of all reactive lesions with prevalence in 5% in pregnancy. Aetiology of the pyogenic granuloma was initially assessed as a mycotic infection of horses and later as streptococci, staphylococci, hormonal, minor trauma, and irritation. But later it was suggested that they might occur as a reactive inflammatory process associated with exuberant fibro vascular proliferation of the connective tissue secondary to trauma and infection. It will occur in any age, with the peak in the second to third decade of life. The female predominance is 1.5:1 in the Female- Male occurrence ratio.[2-5]

While the capillary haemangioma it is relatively rare in the oral cavity, especially in oral soft tissues and uncommonly encountered by the dental profession. Hemangiomas are most often recognized at an early age and encountered more frequently in females than males by ratio of 3:1. Vascular malformations occur in equal incidence among females and males. The hallmark of vascular malformations is proportionate growth throughout the life of the individual. The mucous membranes are often involved contiguously with facial port wine stains. Pyogenic granulomas frequently develop within port wine stained skin; this is particularly common with intraoral stains. Physicians must distinguish these non-proliferative enlargements from the proliferating hemangiomas.[6,7]

**Pathogenesis:**

Recent studies have revealed that sex hormones manifest a variety of biological and immunological effects. Estrogen accelerates wound healing by stimulating Nerve Growth Factor (NGF) production.
in macrophages, Granulocyte- Macrophage-Colony Stimulating Factor (GM-CSF) production in keratinocytes and basic Fibroblast Growth Factor (bFGF) and Transforming Growth Factor beta1 (TGF-β1) production in fibroblasts, leading to granulation tissue formation. Estrogen enhances Vascular Endothelial Growth Factor (VEGF) production in macrophages, an effect that is antagonized by androgens and which may be related to the development of PG during pregnancy. These regulatory effects of sex steroids may be manipulated as therapeutic or prophylactic measures in PG.[8,9]

Vascular malformations are localized or diffuse errors of embryonic development. These are also classified as capillary, lymphatic, venous, arterial or a combination of these depending on the clinical and histological appearance of abnormal channels. The most common capillary malformation[6,10]

There are two kinds of PG namely lobular capillary hemangioma (LCH type) and non-LCH type, which differ in their histological features. The pyogenic lesion usually has a pedunculated shape with a tiny stalk. The pathologist often designates the lesion a “capillary hemangioma, granuloma type” or “lobular capillary hemangioma.” It may be difficult to make a light microscopic differentiation between a true hemangioma of infancy and a pyogenic granuloma. However, pyogenic granuloma exhibits immunocytochemical and ultrastructural differences. It is predominantly perithelial, rather than an endothelial tumor.[11,12]

In pyogenic granuloma the presence of blood vessels with different luminal diameter in the lobular area of LCH PG and in the central area of non-LCH PG may be because different pathogenic factors influence their development. It has been observed that foci of fibrous maturation were present in 15% of non-LCH PG but were totally absent in LCH PG. Although it is possible that PG can undergo fibrous maturation, they showed that this happened only in non-LCH PG.[11]

In our case the patient is of young age and correlate with the site of Pyogenic granuloma of provisional diagnosis with no other portwine or vascular anomalies in history. The histopathology also favors the diagnosis of Pyogenic granuloma with a histopathological variant Non Lobular capillary haemangioma

Conclusion

The term hemangioma is used inconsistently, some sources including vascular malformations, others classifying vascular malformations separately. Also, capillary hemangiomas are infrequently seen on palatal mucosa and may easily be confused with different lesions— particularly with chronic inflammatory gingival hyperplasia Dental surgeons should therefore be aware of these risks during diagnosis and management and should take necessary precautions prior to attempts at excision of apparently innocent lesions. Such situation when a clinician is in dilemma, not cognizant with the possibility of this lesion in its unusual site, can be solved by histopathological assessment which remains the most accurate and satisfactory[13-15]

Conflict of Interest – Nil

Source of Funding – Self

Ethical Clearance – Not required as it as review article

References

Pyogenic granuloma (lobular capillary hemangioma) of the Tongue: a case report

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Types and Classification of Nerve Injury- A Review

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Abstract

Nerve injuries are the most common conditions with varying symptoms depending on the severity, intensity and nerves involved. Though much knowledge exists on the mechanisms of injury and regeneration, reliable treatments that ensure full functional recovery. The type of nerve injury alters the treatment and prognosis. This review article aims to summarize the various types of nerve injuries and classification.

Key Words: Axonotmesis, Neurotmesis, Neurapraxia, Wallerian degeneration.

Introduction

Nerve injuries are the most common conditions with varying symptoms depending on the severity, intensity and nerves involved. Recovery after any nerve injury is variable. Though much knowledge exists on the mechanisms of injury and regeneration, reliable treatments that ensure full functional recovery. The type of nerve injury alters the treatment and prognosis. This review article aims to summarize the various types of nerve injuries and classification of nerve injuries which is useful in understanding their pathological basis, and to evaluate the prognosis for recovery.

Understanding the basic nerve anatomy is important for the classification and also essential to evaluate the clinical prognostic value. In the CNS and PNS there are three connective tissue layers.

ENDONEURIUM- Individual nerve fibers (single axons) are covered with varying amounts of myelin and then covered by endoneurium.

PERINEURIUM-These individually wrapped nerve fibers (endoneurium) are then grouped into bundles of fibers called fascicles, which are covered by perineurium.

EPINEURIUM- Finally, groups of fascicles are bundled together to form the peripheral nerve (such as the median nerve), which is covered by epineurium.

CLASSIFICATION:

CLASSIFICATION BY TYPE OF NERVE INJURY

ANATOMICAL CLASSIFICATION OF NERVE INJURY

CLASSIFICATION BY TYPE OF NERVE INJURY

There are 3 types of nerve injuries:

1) NERVE SECTION:

Nerve section can be partial or complete, sharp or blunt. They often result from sharp wounds by glass, firearms or knives.

2) NERVE STRENGTHING

Stretching can occur in association with displaced fractures. During traction, the perineurium elongated, the axons and epineurium stretches and tears.

3) NERVE COMPRESSION:

Compression can either be extrinsic or intrinsic. Extrinsic is more common in median nerve injury in the carpal tunnel, ulnar nerve at the elbow. Intrinsic

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compression is caused mainly by the nerve tumor.

There are 2 mechanism of peripheral nerve injury results from compression

Indirect mechanism: acute or repeated prolonged compression may cause vascular stasis with vascular permeability increased and formation of endoneural edema.

Direct mechanism: a direct mechanical damage to the myelin sheath or the axon itself, thus limiting nerve conduction.

**ANATOMICAL NERVE INJURY**

There are 2 main types of nerve injury based on the part involved and classified based on correlation with the EMG finding.

Seddon’s classification⁴

Sunderland’s classification⁵

**SEDDON’S CLASSIFICATION**

Seddon provided a basis for assessment, prognosis, and management of nerve injury. He classified nerve injuries into three categories, neurapraxia, axonotmesis, and neurotmesis.

**NEURAPRAXIA**

It is the least severe nerve injury, caused by transient compression or stretch. Conduction block results in loss of nerve function. Paralysis of muscles is innervated by the nerve. This type of injury will recover completely providing the cause, for example, ongoing compression, is removed. Recovery will take hours to months (average 6-8 weeks)

**AXONOTMESIS**

This is an anatomical interruption of the axon with no or only partial interruption of the connective tissue (endoneurium, perineurium, and epineurium). This type of nerve injury requires regeneration of about 1.5-3mm/day of the axon to the target muscle which is inhibited by scar formation. Wallerian degeneration occurs due to loss of axoplasmic flow. Patients with axonotmesis will require surgical treatment depending on the number of axons disrupted and the extent of scar formation at the site of nerve injury. Axons grow in adults at about 1 inch per month, and the recovery may take weeks- months. In infants, the axon may regenerate more rapidly, and the distance to be covered is much less. When a muscle loses its innervation, the nerve receptors will disappear over a period of 1 to 2 years. This may show neurosurgical intervention because, a repair regenerated too late will not have receptors in the muscles for the regeneration of nerves.

**NEUROTMESIS**

Here the nerve is completely disrupted or so badly disorganized. This is the most severe form of nerve injury. Along with axons all the connective tissue layers of the nerve are disrupted. There is axon degeneration distal to the injury. Neurotmesis may be caused by laceration or high energy traction injuries. In addition ischemia or injection of noxious drugs can cause nerve injury. Recovery can only occur after appropriate surgical repair of the nerve and relies on axonal regeneration. Because mixing and disruption of fibers at the site of the repair results in failure of correct distal connections. So the recovery is either imperfect or incomplete.

**LIMITATIONS OF SEDDON’S CLASSIFICATION:**

All grades of intraneural damage is not distinguished in Seddon’s classification. Lesions classified as axonotmesis have been observed to have variable recovery. This is because variable degrees of damage to the connective tissue layers of the nerve, including the endoneurium and perineurium, as well as the axons are possible without loss of continuity of the nerve trunk.

**SUNDERLAND’S CLASSIFICATION :**

Sunderland in 1951 described 5 degree of nerve injury based on the disruption of the nerve and their continuity with the connective tissue. Mckinnon and Dellonadded⁶ a 6th degree injury to Sunderland’s classification where there was variable degree of nerve injury.

1ST DEGREE - conduction block (neurapraxia)

2ND DEGREE- axonal injury (axonotmesis)

3RD DEGREE-axonal injury with endoneurium injury

4TH DEGREE- axonal injury with endoneurium injury and perineurium injury
5\textsuperscript{TH} DEGREE- axonal injury with endoneurium injury, perineurium injury and neurapraxia.

6\textsuperscript{TH} DEGREE- combination of previous injuries

<table>
<thead>
<tr>
<th>Sunderland’s</th>
<th>Seddon’s</th>
<th>Axon</th>
<th>Endoneurium</th>
<th>Perineurium</th>
<th>Epineurium</th>
<th>Fibrillation Potential On Emg</th>
<th>Clinical Sign</th>
<th>Recovery</th>
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<tbody>
<tr>
<td>1\textsuperscript{st} Degree</td>
<td>Neuropraxia</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Absent</td>
<td>Paresthesia, Partial Or Total Palsy</td>
<td>Full (1 Day – 3 Months)</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Degree</td>
<td>Axonotmesis</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Present</td>
<td>Paresthesia, Partial Or Total Palsy</td>
<td>Generally Full (1-6 Months)</td>
</tr>
<tr>
<td>3\textsuperscript{rd} Degree</td>
<td>Axonotmesis</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>Present</td>
<td>Paresthesia, Dysesthesia, Partial Or Total Palsy</td>
<td>Partial (12-24 Months)</td>
</tr>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>Present</td>
<td>Hypothesia, Dysesthesia Or Total Palsy</td>
<td>None Without Repair</td>
</tr>
<tr>
<td>5\textsuperscript{th} Degree</td>
<td>Neurotmesis</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Present</td>
<td>Anesthesia, Total Palsy</td>
<td>None Without Repair</td>
</tr>
<tr>
<td>6\textsuperscript{th} Degree</td>
<td>Combination Of Previous Injury</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Present</td>
<td>Paresthesia, Partial Or Total Palsy</td>
<td>None Without Repair</td>
</tr>
</tbody>
</table>

Correlation between Sunderland, Seddon classification and intact connective tissue

‘+’ intact nerve; ‘-’ injured nerve (not intact)

Discussion

If there is a trauma and signs of a nerve injury then a surgery will be necessary to look at the nerve and if there it has been partly or completely disruption. If there is no wound then it is likely that a “wait & watch” policy will be adopted. Under these circumstances further investigations may be carried out to try and assess the damage to the nerve. There are various investigation method to diagnose the degree of nerve injury; this is done using neurophysiology testing\(^7\) where the nerves are stimulated with an electric current and the speed at which the nerve conducts is measured (electromyography). Neurophysiology tests can distinguish between injuries where axons have not degenerated (neurapraxia) and those where axons have degenerated distally (axonotmesis and neurotmesis). If axonotmesis has affected all the fibers in a nerve then the findings will be indistinguishable neurotmesis. However, in mixed lesion with some fibers intact detection of these will imply that there is no disruption of the nerve trunk. In addition very fine needles may be inserted into an affected muscle and recordings made of the activity in that muscle. Normal nerves can be visualized on MRI although their signal characteristics are not distinct from other tissues\(^8\). A technique called magnetic resonance neurography, which enhances neural tissue on images, was reported by Filler. Modern ultrasound scanners have improved to the extent that resolution is now greater than MRI. Ultrasound is being used increasingly to examine nerves damaged by closed trauma\(^9\). These will help to grade level of injury and can help in treatment planning and giving information on the potential outcome of the injury.

Conclusion

The result of a nerve injury depends on many variables as detailed in this article. The important thing to remember is that nerves take many months to years to repair and recovery. The final result may not be known for two years or more. The purpose of this article is to outline the main types, classification and correlating the nerve injuries to evaluate their clinical value and to improve the prognosis of nerve recovery.
Ethical Clearance - Not required

Source of Funding - Self

Conflict of Interest - Nil

References


Lymphangioma - A Case Report

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Abstract

Lymphangioma is a benign hamartomatous neoplasm of the lymphatic system with a marked predilection for the head and neck region. Most common location is submandibular region and in oral cavity tongue is commonly affected. Around half the cases are present since birth. Herein we report a case of lymphangioma in 25 year old female. The clinical and histopathological finding of the case with possible etiology, management are discussed.

Keywords - Lymphangioma, Hamartoma, Cystic hygroma.

Introduction

Lymphangioma is a benign hamartomatous neoplasm of the lymphatic system, with a marked predilection for the head and neck region and more commonly occurs in submandibular region¹⁻². Around half the cases are present since birth³. The lesion is assessed in the line with the vessels diameter into: microcystic or capillary, macrocystic or cavernous and hygroma or cystic hygroma⁴⁻⁵. Its prevalence in mouth is rare and is more often situated at the anterior two-third of the tongue; although cases in roof of the mouth, gingiva, mucous membrane, lips and alveolar process have been represented¹⁻⁶⁻⁷. Clinically, its location is superficial, seen as clear and usually grouped vesicles, which may be red or purple because of secondary hemorrhage. The deep lesion are seen clinically as nodular masses of variable color and superficial texture⁵. There are many therapeutic modalities for the treatment of oral lymphangioma. Surgical excision is usually indicated once vital structures are not involved⁴⁻⁸.

Case Report

A 25 year old female patient reported with the complaint of pain and swelling on the right side of the tongue for the past 2 months. Intraoral clinical examination revealed the lesion was present as growth on the right lateral surface of the tongue measuring about 1x1 cm in size, erythematous and sessile in nature. There was no regional lymphadenopathy noted. Clinically such lesion was diagnosed either as hemangioma or lymphangioma. To confirm the diagnosis, an incisional biopsy was performed. The haematoxylin and eosin stained histopathological section of the given specimen showed hyperplastic parakeratinized stratified squamous epithelium with underlying connective tissue stroma (Fig-1). The connective tissue was densely collagenized with moderate cellularity with diffuse dense chronic inflammatory cell infiltrate. Numerous endothelial lined blood vessels and lymphatic channels are seen (Fig-2). Therefore, the histopathological diagnosis confirmed it as lymphangioma.

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Discussion

Lymphangiomas are rare inborn malformations of the vascular system that may occur throughout the body with larger predilection for head and neck. Three theories are proposed to explain the origin of Lymphangiomas. The first theory suggests that a blockage or arrest of growth of the primitive lymph channels happens throughout embryogenesis. The second theory says that the primitive lymphatic sac doesn’t reach the blood vessel system, whereas the third theory advances the hypothesis that, throughout embryogenesis, lymphatic tissue lays within the wrong space as a result these cells don’t anastomose efficiently with larger lymphatic vessels, they then provoke areas of lymphatic blockage. Common within the neck region, the anterior triangle of the neck has been indicated because it is the commonest site, primarily bone, trapezius and sternocleidomastoid. The submandibular and salivary gland regions are the more associated areas to lymphangioma development. In oral cavity lymphangiomas occur in the anterior tongue but lip and alveolar ridge and buccal mucosa are involved.

In our case, the lesion is present in the tongue.

The incidence of lymphangiomas has been reportable to vary from 1.2 to 2.8 per thousand newborns. The foremost outstanding sign or symptom of all lymphangiomas is that the presence of a mass. In adult patients, tumor will switch to epithelial cell malignant neoplastic disease. The surface is granular as a result of clear vesicles and color is red or blue as a result of rupture of underlying blood vessels. The deeper lesion could cause higher respiratory tract disorder or incidental trauma at the location and problem in chewing, speech and deformity of the jaws.

Histologically, these lesions are composed of expanded lymphatic channels. These expanded lymphatics will vary in size, relying upon the situation and surrounding tissues and is that the basis for classification consistent with Yaita et al. Relying upon cystic area size, they’re classified as: macrocystic, microcystic and mixed.

Ultra-sonography, CT and imaging scans are often accustomed outline the link of the lesion with the neighboring structures and to assist arrange surgery. The clinical course of the pathology varies from a spontaneously regressive cyst to an aggressively invasive lesion. Spontaneous or traumatic hemorrhage of the cysts is the common complication.

While treatment of lymphangiomas includes surgical excision, cryotherapy, electro surgical procedure, sclerotherapy, steroids administration, embolization, and laser therapy. Surgical excision is the best treatment for lesions presenting localized growth.

Conclusion

Oral lymphangiomas are uncommon lesion occurring at the tongue. Superficial and localized lesion are often treated by conservative approaches like laser therapy, cryotherapy and surgical excision with less relapse rate. Therefore, proper diagnosis is important for proper therapeutic implications.

Conflict of Interest - Nil

Source of Funding - Self

Ethical Clearance - Not required
References


Identification Validity Early Detection of Child Development Using Indonesian Mch Handbook

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ABSTRACT

Children are inevitably essential parts of Indonesian population. Prevalence of children developmental disorders in Indonesia is still pretty high, ranging from 10-18%. In fact, approximately 70% of children with developmental delays are detected without screening. Surabaya is the city with the largest number of Early Childhood Education (PAUD) institutions in East Java, Indonesia. Ministry of Health publish the latest Maternal and Child Health (MCH) Handbook containing a child development checklist. Thus, the purpose of this study is to examine the validity of MCH Handbook as a measuring tool for early detection of child development with Indonesian Pre-Screening Developmental Questionnaire (KPSP) as a gold standard among Early Childhood Education students in Surabaya city. This research was a cross sectional study using diagnostic test design. The population of the study were the children aged 3-72 months in Surabaya city. The sample were selected using multistage cluster random sampling technique, totaling of 400 children. The data were analyzed using Mc. Nemar statistic tests and Kappa Agreement tests. The results showed that there is no difference in the value of development between MCH Handbook and KPSP (p = 1,000). The MCH Handbook was valid with the sensitivity value of 84.5%, specificity value of 96.9% and has a consistency rate of 81.9%. Thus, we can conclude that MCH Handbook is said to be a valid early detection tool for children aged 3 months to 72 months with high agreement value and high sensitivity and specificity. It suggested to health workers to promote the importance of MCH Handbook utilization through social media and Primary Health Care.

Keywords: Child Development, MCH Handbook, Validity

Introduction

Indonesia is one of the countries which has the highest number of population in the world. The number of toddlers accounts for 10% of the total population in Indonesia.1 In 2015, Ministry of Health issued special regulations for health and non-health workers to monitor child growth, including monitoring of gross motor movement, fine motor movement, socialization and independence, as well as speech and language abilities. The child growth monitoring is to perform regularly from children aged 3 months to 72 months. Children with good growth and development in accordance to the age stage are expected to become healthy and productive adults as the state asset, both socially and economically.1,2

The world’s developmental delay rate is around 10%.3 In recent years, there has been about 12-16% in the United States, 24% in Thailand, 22% in Argentina and 13-18% in Indonesia. Surabaya is the city with the highest number of Early Childhood Education in Indonesia. All of them have a risk of developing developmental delay2,3.

The coverage of each Primary Health Service on children under five in Surabaya has decreased since 2015 from 83.58% to 82.54% in 2016. It is in contrast to the fact that in 2010 Ministry of Health expected that 90% of children under five and preschool children be covered by early detection activities1. The unsuccessful attempt on periodic developmental screening is attributed to lack of cross-sector coordination, funding, the provision of Educational Game Equipment (APE) and the stabilization of commitments to implement policies on Stimulation, Detection and Early Intervention of Child Growth and Development (SDIDTK)4.
Most child development disorders are unnoticed at preschool age. In fact, approximately 70% of children with developmental delays are detected without screening. This is due to the absence of obvious symptoms of child development disorders if there is no screening in accordance to standardized instruments. A good screening tool must have the validity, reliability, sensitivity, specificity and suitability to local conditions. To know the quality of the instrument, it is required to test the validity and reliability, while to test the specificity and sensitivity, it is necessary to test the comparison of measuring instruments with gold standard.

In 2015, the government published the latest Maternal Child Health/ MCH Handbook containing a child development checklist. Previously, in 2013 the government issued an Indonesian Pre-Screening Developmental Questionnaire (KPSP). KPSP should only be used by health workers. To assess KPSP, someone requires special skills, unlike the MCH Handbook which can be read and used by parents as the first known child. Parents can utilize MCH Handbook as a stimulation guide and for monitoring child development. Hence, this study aims to identify the validity of MCH Handbook as a measuring tool of early detection of child development in Indonesia.

**Materials and Method**

This is a cross-sectional study with diagnostic test design. The study was conducted in Surabaya City from March to May 2018. Research respondents were 400 PAUD children aged 3 months to 72 months obtained by multistage cluster random sampling technique.

Primary data was collected by examining the child’s development status using KPSP and MCH Handbook. The KPSP measurement tool is a translation of the Indonesian version of Pre-screening Developmental Questionnaire (PDQ) which contains 10 questions about the child’s developmental skills, which parents must answer with yes and no answers, which only takes 10-15 minutes. In this study if the answer ‘Yes’ less than 9 suspected the problem (suspect), if the answer ‘Yes’ 9-10 is considered no problem (normal). While based on MCH Handbook, children are normal if not able to answer a maximum of 1 question posed.

Diagnostic tests are carried out by researchers to obtain the sensitivity and specificity of the MCH Handbook. Processing techniques and data analysis using a computer with statistical program and Mc test. Nenar and Kappa’s Agreement.

**Findings**

Table 1 shows that the distribution of child respondents by sex is approximately the same between women (50.8%) and men (49.2%). The most frequently age that encountered during developmental examination was 72 months (25.3%) while at least was 9 months (0.5%). The children age 72-months were easy to find at the educational level such as Kindergarten.

Table 1 shows that the majority of maternal respondents are mature and productive is about 60.8% (age 25-35 years). In terms of education level, the majority of mothers have a fairly high level of education (83.5%). When viewed in terms of employment, the majority of mothers choose to work at home (54%). The choice of mothers to work at home does not indicate a low level of family income. This condition is indicated by 69.5% of families fulfilled in accordance with the Regional Minimum Wage (UMR) in force in Surabaya.

**Table 1: Characteristic of Respondents**

<table>
<thead>
<tr>
<th>Characteristics</th>
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<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>197</td>
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<tr>
<td>Female</td>
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<td><strong>Age (months)</strong></td>
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<td>4.8</td>
</tr>
<tr>
<td>36 months</td>
<td>23</td>
<td>5.8</td>
</tr>
<tr>
<td>42 months</td>
<td>32</td>
<td>8.0</td>
</tr>
<tr>
<td>48 months</td>
<td>38</td>
<td>9.5</td>
</tr>
<tr>
<td>54 months</td>
<td>36</td>
<td>9.0</td>
</tr>
<tr>
<td>60 months</td>
<td>62</td>
<td>15.5</td>
</tr>
<tr>
<td>66 months</td>
<td>51</td>
<td>12.8</td>
</tr>
<tr>
<td>72 months</td>
<td>101</td>
<td>25.3</td>
</tr>
</tbody>
</table>
Table 2 shows that the majority of children are normal based on KPSP (82.3%) and MCH Handbook (82.5%). The prevalence suspicion of developmental disturbance is 17.8% based on KPSP and 17.5% based on MCH Handbook. The sensitivity value of MCH Handbook is 84.5% while the specificity is 96.9%. Positive Predictive Value (PPV) calculation is high, 85.7% with Negative Predictive Value (NPV) which is also high (96.6%).

Mc Nemar test is used to compare MCH Handbook with gold standard (KPSP). Table 3 shows that there is no difference in the results of the examinations of the two measuring devices (sig = 1,000; p-value> 0.05). This is indicating that the MCH Handbook can be used to assess the child’s developmental status at home.

From the analysis results in table 3, we can know that the measuring tool MCH Handbook declared valid in measuring the child’s development status. To see how much the consistency of MCH Handbook assessment, Kappa’s Agreement coefficient test was performed. Table 4 shows the agreement between the two measuring devices (sig = 0,000; p value <0.05). The level of agreement on the results of the examination between the two measuring instruments is high (81.9%).

Discussion

Validity of measuring instrument test is defined as the ability of a measuring instrument to distinguish who is sick and not sick. Then this validity can be assessed with sensitivity and specificity. Based on the results of the study, the sensitivity of the MCH Handbook is seen from its ability to correctly identify children who are suspected of deviation in their development. Determination of false positive and negative will impact on health services provided.

Table 2: Developmental status based on MCH Handbook and KPSP

<table>
<thead>
<tr>
<th>Developmental Status</th>
<th>Indonesian PDQ (KPSP)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suspect</td>
<td>%</td>
</tr>
<tr>
<td>MCH Handbook</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspect</td>
<td>60</td>
<td>15,0</td>
</tr>
<tr>
<td>Normal</td>
<td>11</td>
<td>2,8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>71</td>
<td>17,8</td>
</tr>
</tbody>
</table>

Sensitivity 60/60 + 11 = 84, 5%; PPV = 60/60 + 10 = 85, 7%;
Spesivisity 319/319 + 10 = 96, 9%; NPV = 319/319 + 11 = 96, 6%
### Table 3: Result of Mc. Nemar analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gold Standard</th>
<th>p-value</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCH Handbook</td>
<td>Indonesian PDQ (KPSP)</td>
<td>1,000</td>
<td>There is no difference developmental status (valid)</td>
</tr>
</tbody>
</table>

### Table 4: Result of Kappa’s Agreement analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gold Standard</th>
<th>p-value</th>
<th>Kappa’s Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCH Handbook</td>
<td>Indonesian PDQ (KPSP)</td>
<td>0,000</td>
<td>81,9%</td>
</tr>
</tbody>
</table>

Calculation of sensitivity value of measuring tool MCH Handbook classified as high (84.5%). This means that measurements using the MCH Handbook can represent 84.5% of cases of developmental suspicion correctly based on the gold standard. This is because the details of the questions in the MCH Handbook can represent the child’s development status before further diagnosis was made. Each of the details asked has included four aspects of development as set forth in the guidance of SDIDTK.¹

In Korea, Hyo Yun (2011) conducted a study on 226 children by comparing measurements issued in his country, Korean-Ages and Stages Questionnaire (K-ASQ) with Denver II. The result said that sensitivity of 76.3-90.2% was high. Based on the results of the study K-ASQ is feasible to be used to detect the child’s development status in Korean territory.⁸

The results of the study from Glascoe and Bryne (1992) concluded the same thing. According to him, the sensitivity value generated from Denver II is high at 83%. The study was conducted in 104 children ages 3 months to 72 months in five child care centers. Accurate screening will contribute to the necessary early intervention measures in children with suspected developmental impairment. Research in the Arab region conducted by Ansari and Bella (1998) revealed that the developmental pre-screening tool adopted from the DDST revision showed high sensitivity. Adoption is done by translating the points of development aspects that are asked in accordance with the ethnic and cultural conditions in Arabia.⁸³⁹

Dhamayanti (2006) from Bandung city, Indonesia less agree with the results of research. The sensitivity of the measuring instrument is moderate 60%. This is because the use of tools is not worth it. Similarly, Kadi (2008) who studied 85 children aged 12-14 months with a history of Low Birth Weight (LBW) in Bandung for one month in February to March 2008. The result said that sensitivity of the measuring instrument by 63%²⁰¹¹.

Calculation of specificity value of MCH Handbook measuring instrument is high (96.9%). This is due to the details of the question to assess the child’s development in the MCH Handbook according to the general condition of the child in the field so that the child is able to perform and execute the instruction easily. In addition, more or less questions asked have been based on the KPSP so that the details of the question difference are not too great. The results are supported by research of Artha (2014) on 133 toddlers aged 6-60 months in Yogyakarta, Indonesia.¹⁰¹¹,¹²

The result of research proves that MCH Handbook measuring instrument is valid with high agreement level (81.9%). The value of this high agreement is supported by the result of the assessment of normal child development status resulting from KPSP and MCH Handbook also tend to be the same i.e. 82.3% and 82.5%. The advantages of this study shows that this research was conducted on general population of children under five years’ age range 3 months to 72 months, not limited to toddlers with high risk factors such as some previous research. The selection of such research subjects is more appropriate in the context of the use of both devices as a means of screening. In addition, the location of the study does not lie in slum areas that are prone to experience developmental delays due to lack of stimulation. Field observations show the items that the MCH Handbook asks are likely to be easily answered or can be done by normal children in general, so the agreement obtained tends to be high.¹⁰¹¹,¹²

The value of the agreement of a high measuring instrument is supported by Artha, et al (2014). Furthermore, research conducted in the Tehran region by Shahshahani, et al (2010) states that the Persia version of the developmental expedition screening guidelines adopted from Denver II has good validity and reliability in detecting child development status when compared with Ages and Stages Questionnaire (ASQ). The study
was then followed up by Kazemnejad (2011) in Tehran in children aged 4-60 months. However, Marjolaine et al (2011) in his research area indicated that the agreement between ASQ and Denver II was high when compared with PEDS\textsuperscript{12,13,14}.

The results of the research in the field was less agree with Kadi (2008) which resulted in the value of a moderate agreement. This is due to the different research area conditions, the number of different research subjects and the tools used are also different. His study was conducted in one place and at one age point, thus less reflecting equality at other ages\textsuperscript{11}.

The disagreement on the results of the examination between commonly used screening tools further indicates the importance of good development surveillance processes. The role of clinician with experience and clinical skills becomes important to capture children who are likely or at risk of developing disorders. Some of the existing screening tools should be used with a good understanding of their respective advantages and disadvantages. Selection of any device should consider the things combined with the suitability of the existing clinical setting.

**Conclusion**

The MCH Handbook was valid as an early detection tool for children aged 3 months to 72 months with high agreement value (81.9\%) and high specificity sensitivity (84.5\% and 96.9\%). Most children were normal according to KPSP (82.3\%) and MCH Handbook (82.5\%). It is recommended for health workers to promote the importance of utilizing MCH Handbook through social media and Primary Health Care.

**Conflict of Interest:** There is no conflict of interest in the study

**Ethical Clearance:** The study was received ethical approval from the Health Research Ethics Committee, Faculty of Public Health, Airlangga University.

**Source of Funding:** Self

**REFERENCES**


Feasibility Study of Development in Financial Aspect of Hemodialysis Service in “Y” Hospital in East Java, Indonesia

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ABSTRACT

This study aims to analyze the feasibility of development hemodialysis service in “Y” Hospital in East Java based on the financial aspect. Descriptive observational study during June-December 2017. Data collection through interviews with the chief and staff in hemodialysis installation, observation and analysis of secondary data from reports of hemodialysis installations and other data from various sources of installation such as human resources, medical records. The data obtained are then analyzed, then the preparation of the estimated needs of investment funds and funding sources, making projected service revenues, making projected fixed costs and fixed costs, making projected cash flow for the next 10 years, and projected profit and loss 10 years. The development of hemodialysis service in “Y” Hospital from financial aspect analysis is not feasible, but hemodialysis service has benefit tangible and intangible benefit, which may be further investigated if the benefit value is greater. Thus the development of hemodialysis services is still needed.

Keywords: feasibility study, financial aspect, hemodialysis services, “Y” Hospital in East Java

Introduction

Indonesia is one country with a high rate of kidney failure, according to the Indonesian Nephrology Association (PERNEFRI) in The Report of Indonesian Renal Registry, in 2012 there were 16,040 patients with renal failure. Reportedly in 2012 only 9161 patients are active in hemodialysis activities1,2.

“Y” Hospital is a hospital belonging to Government B grade Education in East Java. One of the areas in the hospital that became a priority in the effort to improve the service quality in the hospital is hemodialysis service that has been increasing the number of patients in recent years. The number of patients with kidney failure each year also increased by about 15%3,4.

At the “Y” Hospital, there are still many patients who have not been able to receive hemodialysis services, one of them due to limited number of hemodialysis machines. More than 400 patients with chronic kidney disease undergo hemodialysis in the current “Y” Hospital. Due to the large number of patients with chronic kidney disease, they have to wait a long time to get hemodialysis services, because the number of hemodialysis machines in the “Y” Hospital is very limited ie only 23 machines5,6.

In a day, the average number of hemodialysis patients reached 69-70 people. Hemodialysis patients in “Y” hospitals were largely unhealthy for hemodialysis therapy, due to the large number of patients and the limited availability of hemodialysis machines. Seeing the condition of the “Y” Hospital took the initiative to plan the construction of hemodialysis building, with the addition of hemodialysis machine reached 100 units in 20197,8.

In accordance with the need to develop a hemodialysis unit by planning the addition of a hemodialysis machine at the “Y” Hospital, it is necessary to have a thorough analysis of all matters related to conducting a feasibility study or called feasibility study. One aspect analyzed from the feasibility study is the financial aspect.

Method

Descriptive observational study during June-December 2017. Data collection through interviews with the head of the installation and executive personnel in hemodialysis services; direct observation of hemodialysis service actions, completeness of infrastructure, human resources and equipment in the hemodialysis chamber; retrieval of secondary data from reports of hemodialysis
installations and other data from various installation sources such as human resources, medical records.

The data obtained were then analyzed to see the needs of hemodialysis services in “Y” Hospital through calculation of the number of patients and the number of hemodialysis actions in 2018-2027. In addition, feasibility analysis of the needs of land for buildings, infrastructure, human resources and equipment in accordance with regulation standards of hemodialysis services. Next make an estimate of the need for investment funds and funding sources, make projected service revenues, make projected fixed costs and fixed costs, make a projection of the next 10 years cash flows, and projected profit and loss 10 years to get Net Present Value (NPV) and Internal Rate of Return (IRR). So from these results can be concluded feasibility level of development of hemodialysis service in “Y” Hospital.

**Results and Discussion**

Table 1 shows the number of hemodialysis patients of the “Y” Hospital from 2012-2027 classified as: new patients, elderly patients, stop hemodialysis (drop out) patients, as well as patients on hemodialysis (active).

<table>
<thead>
<tr>
<th>Type of Patient</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>100</td>
<td>319</td>
<td>441</td>
<td>371</td>
<td>380</td>
<td>405</td>
</tr>
<tr>
<td>Elderly</td>
<td>196</td>
<td>204</td>
<td>220</td>
<td>244</td>
<td>261</td>
<td>372</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>515</td>
<td>645</td>
<td>591</td>
<td>624</td>
<td>666</td>
</tr>
<tr>
<td>Drop out</td>
<td>43</td>
<td>216</td>
<td>221</td>
<td>299</td>
<td>260</td>
<td>248</td>
</tr>
<tr>
<td>Active</td>
<td>-</td>
<td>299</td>
<td>424</td>
<td>292</td>
<td>364</td>
<td>419</td>
</tr>
</tbody>
</table>

Source: Data from Hemodialysis Installation in “Y” Hospital

Conducted forecasting with projected 10 years ahead of the number of patients in 2012-2017. The calculation of forecasting used using linear regression method. From the calculation of forecasting, then the data obtained the number of patients and the number of hemodialysis action in 2018-2027. In 2027 it is estimated that the number of regular active patients hemodialysis is 574 patients with an estimated action of 59.727. From the calculation it is found that hemodialysis and bed machines are needed as many as 103 units in 2027.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total of Patients</th>
<th>Need for Treatment (Year)</th>
<th>Need for Treatment (Day)</th>
<th>Need for Machine Total (Shift)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018*</td>
<td>413</td>
<td>42.973</td>
<td>148</td>
<td>74</td>
</tr>
<tr>
<td>2019</td>
<td>431</td>
<td>44.834</td>
<td>155</td>
<td>77</td>
</tr>
<tr>
<td>2020</td>
<td>449</td>
<td>46.696</td>
<td>161</td>
<td>81</td>
</tr>
<tr>
<td>2021</td>
<td>467</td>
<td>48.558</td>
<td>167</td>
<td>84</td>
</tr>
<tr>
<td>2022</td>
<td>485</td>
<td>50.419</td>
<td>174</td>
<td>87</td>
</tr>
<tr>
<td>2023</td>
<td>503</td>
<td>52.281</td>
<td>180</td>
<td>90</td>
</tr>
<tr>
<td>2024</td>
<td>521</td>
<td>54.142</td>
<td>187</td>
<td>93</td>
</tr>
<tr>
<td>2025</td>
<td>539</td>
<td>56.004</td>
<td>193</td>
<td>97</td>
</tr>
<tr>
<td>2026</td>
<td>556</td>
<td>57.866</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>2027</td>
<td>574</td>
<td>59.727</td>
<td>206</td>
<td>103</td>
</tr>
</tbody>
</table>

Machine hemodialysis and bed needed in 2027 as many as 103 units. With the addition of hemodialysis and bed machines, additional buildings for hemodialysis, additional facilities and infrastructure, additional medical and non-medical equipment, and the addition of doctors and nurses with hemodialysis competence are required. The above additions are made through calculations based on the Hemodialysis Service Guidelines.
Calculation of total income projection hemodialysis Installation in “Y” Hospital assumed 100% of patients with Board of National Health Insurance (called BPJS) financing, although in real data obtained 0.1% of hemodialysis patients are general patients. In 2018 the income received by “Y” Hospital from BPJS for one time hemodialysis service is Rp 879,100. It is assumed that there will be a 10% tariff increase every 2 years\(^1\). Then the projection of total revenue in 2018-2027 as in Table 3.

### Table 3: Projected Total Revenue of Hemodialysis Installation in “Y” Hospital in 2018*-2027

<table>
<thead>
<tr>
<th>Year</th>
<th>Need for Treatment (Year)</th>
<th>Estimate of Tariff in Hemodialysis from BPJS</th>
<th>Total Income from Hemodialysis Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018*</td>
<td>21.486</td>
<td>Rp 879.100,-</td>
<td>Rp 16,767,953.400,-</td>
</tr>
<tr>
<td>2019</td>
<td>44.834</td>
<td>Rp 967.010,-</td>
<td>Rp 43,355,313.144,-</td>
</tr>
<tr>
<td>2020</td>
<td>46.696</td>
<td>Rp 967.010,-</td>
<td>Rp 45,155,498.960,-</td>
</tr>
<tr>
<td>2021</td>
<td>48.558</td>
<td>Rp 1,063.711,-</td>
<td>Rp 51,651,253.254,-</td>
</tr>
<tr>
<td>2022</td>
<td>50.419</td>
<td>Rp 1,063.711,-</td>
<td>Rp 53,631,457.651,-</td>
</tr>
<tr>
<td>2023</td>
<td>52.281</td>
<td>Rp 1,170.082,-</td>
<td>Rp 61,172,828.254,-</td>
</tr>
<tr>
<td>2024</td>
<td>54.142</td>
<td>Rp 1,170.082,-</td>
<td>Rp 63,351,053.091,-</td>
</tr>
<tr>
<td>2025</td>
<td>56.004</td>
<td>Rp 1,287.090,-</td>
<td>Rp 72,082,205.721,-</td>
</tr>
<tr>
<td>2026</td>
<td>57.866</td>
<td>Rp 1,287.090,-</td>
<td>Rp 74,478,253.042,-</td>
</tr>
<tr>
<td>2027</td>
<td>59.727</td>
<td>Rp 1,415.799,-</td>
<td>Rp 84,561,730.400,-</td>
</tr>
</tbody>
</table>

**Note:** 2018* is July until December

Estimated amount of investment cost needed for the development of hemodialysis service in “Y” Hospital is divided into: investment cost of building land, investment cost of infrastructure, and investment cost of equipment. The total cost of land and building investment in the first phase of 2017 is Rp 15,132,320,000, while the second phase of building investment cost in 2018 is Rp 17,000,000,000. The cost of infrastructure investment in 2017 is Rp 2,698,055,000. The cost of equipment investment in 2017 is Rp 4,005,783,520. So the total investment cost required is Rp 38,836,158.520.

The cost calculation in this feasibility study also includes both direct and indirect costs. Estimated direct costs in the hemodialysis installation in “Y” Hospital include: the cost of consumable hemodialysis equipment, the cost of laboratory examination (complete blood, and S/TIBC), the cost of injection erythropoietin and iron injection preparations, the cost of dialysate fluid, the cost of clean water for the hemodialysis process, as well as the cost of medical services for hemodialysis services\(^14,15\). Total direct cost of hemodialysis installation in “Y” Hospital as in Table 4, below:

### Table 4: Total Direct Cost of Hemodialysis Installation in “Y” Hospital in 2018*-2027

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Direct Cost of Hemodialysis Installation Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018*</td>
<td>Rp 19,282,252.829</td>
</tr>
<tr>
<td>2019</td>
<td>Rp 42,634,196.249</td>
</tr>
<tr>
<td>2020</td>
<td>Rp 46,166,227.067</td>
</tr>
<tr>
<td>2021</td>
<td>Rp 50,869,663.112</td>
</tr>
<tr>
<td>2022</td>
<td>Rp 54,917,579.879</td>
</tr>
<tr>
<td>2023</td>
<td>Rp 60,341,568.944</td>
</tr>
<tr>
<td>2024</td>
<td>Rp 64,974,022.129</td>
</tr>
<tr>
<td>2025</td>
<td>Rp 71,216,474.187</td>
</tr>
<tr>
<td>2026</td>
<td>Rp 76,510,767.807</td>
</tr>
<tr>
<td>2027</td>
<td>Rp 83,682,055.767</td>
</tr>
</tbody>
</table>

**Note:** 2018* is July until December

Indirect costs of hemodialysis installation in “Y” Hospital include: the cost of electricity at hemodialysis installation, solid waste processing cost, the cost of doctor’s salary, and the cost of nurse salary hemodialysis installation\(^16,17\). Total indirect cost of hemodialysis installation in “Y” Hospital as in Table 5, below:
Table 5: Total Indirect Cost of Hemodialysis Installation in “Y” Hospital Year 2018*-2027

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Indirect Cost of Hemodialysis Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018*</td>
<td>Rp 1.490.360.197</td>
</tr>
<tr>
<td>2019</td>
<td>Rp 3.321.534.346</td>
</tr>
<tr>
<td>2020</td>
<td>Rp 3.696.278.081</td>
</tr>
<tr>
<td>2021</td>
<td>Rp 4.108.158.869</td>
</tr>
<tr>
<td>2022</td>
<td>Rp 4.560.679.771</td>
</tr>
<tr>
<td>2023</td>
<td>Rp 5.057.666.519</td>
</tr>
<tr>
<td>2024</td>
<td>Rp 5.603.296.813</td>
</tr>
<tr>
<td>2026</td>
<td>Rp 6.859.153.104</td>
</tr>
<tr>
<td>2027</td>
<td>Rp 7.579.796.257</td>
</tr>
</tbody>
</table>

Note: 2018* is July until December

Based on the results of financial cash flows analysis, as in Table 6, it is estimated that the nett cash until the year 2027 is still experiencing a deficit of Rp 6.700.121.625

Table 6: Ten Year Cash Flow Development of Hemodialysis Service in Hospital “Y”

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Income</th>
<th>Total Investment Cost</th>
<th>Total Cost (Direct and Indirect)</th>
<th>Nett Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Rp 15.132.320.000</td>
<td>(-) Rp 15.132.320.000</td>
<td>(-) Rp 27.708.498.146</td>
<td></td>
</tr>
<tr>
<td>2024</td>
<td>Rp 63.351.053.091</td>
<td>(-) Rp 7.226.265.851</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td>Rp 72.082.205.721</td>
<td>(-) Rp 5.336.400.714</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2026</td>
<td>Rp 74.478.253.042</td>
<td>(-) Rp 8.891.667.869</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2027</td>
<td>Rp 84.561.730.400</td>
<td>(-) Rp 6.700.121.625</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 2018* is July until December

While the results of financial profit and loss analysis, then obtained Net Present Value (NPV) of (-) Rp 69.002.308.249. Where the Value of Internal Rate of Return (IRR) produces a negative number so can not be calculated when the return of investment funds planned. So it can be concluded that the investment feasibility assessment is not feasible18,19.

Conclusion

The development of hemodialysis services from financial aspect analysis is not feasible, but Hemodialysis service has benefit tangible and intangible benefit, which may be further investigated if the benefit value is greater. Thus the development of hemodialysis services is still needed. In addition the function of the establishment of the Hospital is as a social function, so the development of Hemodialysis services is still needed.

Suggestions for the development of Hemodialysis services at “Y” Hospital are among others: (1) Efficiency effort is needed by negotiating consumable price to the vendor of hemodialysis machine providers, (2) Conducting KSO MOU tools with multiple vendors.
(more than 2 vendors) the opportunity to monopolize the consumable price, (3) It needs to be recounted on the distribution of medical services, so that the hospital gets a rational match between income and financing, and (4) Strives for additional government grants for the development of hemodialysis services, since development indication is a social indication.

Conflict of Interest: The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

Source of Funding: All sources of funding from author.

Ethical Clearance: This study get the ethical approval from ethical committee in Faculty of Public Health, Universitas Airlangga.

References
Spatio of Lungs Tuberculosis (Tb Lungs) in East Java Using Geographically Weighted Poisson Regression (GWPR)

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ABSTRACT

Pulmonary tuberculosis patients lose nearly 40% of their productive time. This results in reduced productivity if he is the head of the family or productive. In addition, pulmonary tuberculosis patients become highly dangerous transmitters if they do not pay attention to handling the correct cough and being in a location with a high sexual percentage. Likewise, people who are hurt, will have great information, contracting, if any, and very experienced. This study aims to map the grouping of tuberculosis patients and who are at risk of contracting by time rather than looking at the factors that influence it by using poisson regression that address the presence of GWPR over dispersion. The results obtained there are 5 grouping of areas, with the most significant factors of the district plus the ratio of Trenggalek basic health facilities (Z2) and the percentage of school (Z4) and poor population (X1), BTA + (X2), HIV / AIDS incidence rate (X3) incidence of diabetes mellitus (X4), population density (X5) and ratio of health personnel (X6).

Keywords: TB Lungs, Poisson Regression, GWPR

Introduction

Tuberculosis sucks the attention of developing and world governments, as the treatment of pulmonary TB patients takes a lot of money, energy and time. A pulmonary tuberculosis patient requires substantial funds to complete treatment and involves field workers who monitor and take 8 (eight) months treatment even more. This has a negative impact on developing countries that should require funding to advance education, technology and community prosperity1. The economic status is very closely related to TB transmission, since small income makes people unable to live by meeting health requirements. Pulmonary tuberculosis patients with low economic levels find difficulty in meeting the requirements of healthy homes or balanced nutrition, this is in line with the Rosiana2 study, which lists 34.4% of respondents with smear + and resistant to Anti-Tuberculosis (OAT) drugs, derived from economic level below. Kizito et al (2014, p.300) in the Journal of Tuberculosis and Lung Diseases3, wrote in Kampala, Uganda, that there were 100,000 people who had been notified and waiting treatment in 2013 who all lived in slum and densely populated with bad personal hygiene, which is the source of transmission of Mycobacterium tuberculosis. People with HIV / AIDS (Human Immunodeficiency Virus / Acquired Immuno Deficiency Syndrome) are susceptible to contracting pulmonary tuberculosis, this is supported by Mesfin, et al’multi-drug resistant tuberculosis (MDR). Likewise with Diabetes Mellitus, people with DM will experience weakness of the immune system, causing the sufferer to have 3 times more likely to suffer from TB, this is written by Laurentia M, et al4, which within 10 years obtained the results of
DM screening (Diabetes Mellitus) in patients with TB showed a high prevalence of about 5.4% - 44.0%, and otherwise diabetes mellitus as a risk factor to make TB resistant (OR: 1.5 - 8.9). So people with HIV-AIDS and people with DM if they become patients with pulmonary tuberculosis, are highly infectious transmitters.

Bera, dkk\(^3\) writes with low house sanitation in a slum neighborhood in Maharashtra India, making children susceptible to contracting Mycobacterium Tuberculosis. The same thing was written in Fatimah, dkk\(^4\) on the result of his research getting the lighting (OR = 3,286), humidity (OR = 3,202), ventilation (OR = 4,144). Home sanitation contributes to the survival of the Mycobacterium Tuberculosis germ, which is then a source of contagion. Kuruc V., et al. (2014) as well as Grant M (2014) writes in The International Journal of Tuberculosis and Lung Disease\(^5\), in Cape Town South Africa the difficulty of reaching basic health facilities is one factor that makes a person slow to be detected as a tuberculosis patient.

Jacob, dkk\(^3\) writes that the most dominant risk factor is education. To support the global tuberculosis control program, early introduction of pulmonary tuberculosis in primary schools and the use of information media needs to be improved in order to decrease cases and deaths from pulmonary tuberculosis especially in the productive age.

Based on the above explanation, this research would like to see the grouping of regions around Tuberculosis sufferers in East Java Province along with predictor variables that are likely to influence and see good relationship model by using poisson regression analysis.

### Material and Method

This study uses secondary data from East Java Province Health Profile Year 2015 and P2TB Report Year 2015 East Java Provincial Health Office. The first dependent variable was the pulmonary tuberculosis sufferer who was first confirmed as the first patient \(Y_1\) with 6 predictor variables of the percentage of poor families \((X_1)\), BTA + \((X_2)\), the number of HIV / AIDS \((X_3)\), numbers Genesis Diabetes Mellitus \((X_4)\), the percentage of the population density of \((X_5)\) and the ratio of health workers \((X_6)\). \(Y_2\) is a patient with pulmonary tuberculosis determined 3 months later, with 4 predictor variables of healthy house \((Z_1)\), ratio of basic health facility \((Z_2)\), percentage of household PHBS \((Z_3)\), percentage of school population \((Z_4)\) and the layout of the latitude South \((u_i)\) and East longitude layout \((v_i)\).

Data analysis using the following steps:

1. Detecting the presence of multicollinearity on the predictor data \(Y_1\) and \(Y_2\)
2. Looking for the best model of poisson regression from transmitted and infected tuberculosis patient in East Java Province
3. Certainty of overdispersion
4. Looking for the best model from GWPR by looking at the smallest AICc number

### Results

The detection result of non-occurrence of multicollinearity in each predictor of each dependent variable can be seen in table 1

<table>
<thead>
<tr>
<th>Transmitters TB ((Y_1))</th>
<th>Infected TB ((Y_2))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
<td><strong>VIF</strong></td>
</tr>
<tr>
<td>Percentage of Poor Family ((X_1))</td>
<td>2.002</td>
</tr>
<tr>
<td>BTA + ((X_2))</td>
<td>4.684</td>
</tr>
<tr>
<td>Number of Occurrences of HIV/AIDS ((X_3))</td>
<td>5.183</td>
</tr>
<tr>
<td>Genesis of Diabetes Mellitus ((X_4))</td>
<td>3.028</td>
</tr>
<tr>
<td>Percentage of Population Density ((X_5))</td>
<td>7.721</td>
</tr>
<tr>
<td>Ratio of Health Personnel ((X_6))</td>
<td>2.112</td>
</tr>
</tbody>
</table>

The result of the parameter estimation value reach convergent after the 5th iteration. Furthermore, the simultaneous parameter testing to determine whether there is influence of independent variables to the dependent variable with the following hypothesis:

Table 1: Data Multicolastic Detection
\[ H_0 : \gamma_i^* = \gamma_1^* = \gamma_2^* = \gamma_3^* = \gamma_4^* = 0 \]
\[ H_1 : \text{most no one } \gamma_i^* \neq 0, j = 1, 2, 3, 4, 5 \]

The deviance value in this analysis is 1660.2 and \( c_\alpha((32,0,0)) = 46.1943 \), then reject \( H_0 \) because \( D(\hat{\beta}_{\text{arithmetic}}) > \chi^2(\nu;\alpha) \) so it can be concluded that there is at least one independent variable that has a significant effect on the dependent variable. Partial parameters are then tested to determine the effect of each independent variable.

\[ H_0 : \gamma_j = 0 \text{ (the i-th variable has no significant effect)} \]
\[ H_1 : \gamma_j \neq 0, \text{ (the i-th variable gives significant influence)} \ j = 1, 2, 3, 4, 5 \]

By using MLE method obtained the following parameter estimation:

**Table 2: Partial Test Parameters Poisson Regression In pulmonary tuberculosis contracted with pulmonary tuberculosis source prediction**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Estimated</th>
<th>Standard Error</th>
<th>Z</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \gamma_0 )</td>
<td>6.05500</td>
<td>0.0425600</td>
<td>142.249</td>
<td>0.000</td>
</tr>
<tr>
<td>( \gamma_1 )</td>
<td>-0.00663</td>
<td>0.0003728</td>
<td>-17.789</td>
<td>0.000</td>
</tr>
<tr>
<td>( \gamma_2 )</td>
<td>0.00359</td>
<td>0.0003666</td>
<td>9.778</td>
<td>0.048</td>
</tr>
<tr>
<td>( \gamma_3 )</td>
<td>0.00117</td>
<td>0.0005919</td>
<td>1.975</td>
<td>0.002</td>
</tr>
<tr>
<td>( \gamma_4 )</td>
<td>-0.00131</td>
<td>0.0004171</td>
<td>-3.143</td>
<td>0.018</td>
</tr>
<tr>
<td>( \gamma_5 )</td>
<td>0.0008563</td>
<td>0.0000083</td>
<td>103.708</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 2 shows that \( |Z_{\text{arithmetic}}| > Z_{(0.02)} \) where equal to 1.96, so at a significant level 5% reject \( H_0 \) which means variable percentage of healthy homes \( (Z_1) \), ratio of basic health facilities \( (Z_2) \), percentage of households with PHBS \( (Z_3) \), percentage of school population \( (Z_4) \) and prediction \( Y_1(\hat{Y}) \) has a significant effect on the number of people with pulmonary TB infected in 2015. So the poisson regression model obtained is as follows:

\[ \hat{\mu} = \exp(6.055 - 0.007Z_1 - 0.004Z_2 + 0.001Z_3 - 0.001Z_4 + 0.0009(\hat{Y}_1)) \]

The increase and decrease of the number of lung tuberculosis patients infected with \( Y_1 \) per district/city in East Java Year 2015 depends on the coefficient value of each influencing variable. Further examination of overdispersion cases in the Poisson regression model presented in table 3

**Table 3: Overdispersion Inspection**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Value</th>
<th>db</th>
<th>Value/db</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviance</td>
<td>1660.2</td>
<td>32</td>
<td>51.88</td>
</tr>
</tbody>
</table>

Table 3 shows that the deviance/db value of 51.88 is greater than 1 so it can be concluded in the poisson regression model the number of infected pulmonary tuberculosis patients with \( Y_1 \) per district/city in East Java 2015 overdispersed.

The next step to get the GPR model is to determine the point of coordinates of latitude and longitude at each location, calculate the euclidean distance, and determine the optimum bandwidth value based on Cross Validation (CV) criteria. The next step is to determine the weighting matrix with the kernel function.

The weighted matrix obtained for each location is then used to form the model, so that different models are obtained at each observation location. Estimation of GWPR model parameters is presented in table 4 below:

**Table 4: Parameter Model Estimation of GWPR**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \gamma_1 )</td>
<td>6.35866</td>
<td>6.93825</td>
</tr>
<tr>
<td>( \gamma_2 )</td>
<td>-0.79574</td>
<td>0.12149</td>
</tr>
<tr>
<td>( \gamma_3 )</td>
<td>0.00171</td>
<td>0.35332</td>
</tr>
<tr>
<td>( \gamma_4 )</td>
<td>-0.16109</td>
<td>0.36839</td>
</tr>
<tr>
<td>( \gamma_5 )</td>
<td>-0.38866</td>
<td>0.48457</td>
</tr>
</tbody>
</table>

Modeling the number of pulmonary tuberculosis patients infected with in the District / City of East Java Province using the Geographically Weighted Poisson Regression (GWPR) approach is temporarily a better model when compared to the Poisson regression model.

The hypothesis testing of the GWPR model consists of two tests, namely the GWPR model conformity test and the parameter significance test of the GWPR model. Here are the results of hypothesis testing GWPR model:
H₀: \( \gamma_i(u, v) = \gamma_k; k = 1, 2, \ldots, 38 \) (There is no significant difference between the poisson regression model (global) and the GWPR model)

H₁: There is at least one \( \gamma_i(u, v) \neq \gamma_k \) (There is a significant difference between the poisson regression model (global) and the GWPR model)

Table 5: Table of Conformity Testing of GWPR Model with Adaptive Gaussian Weighing

<table>
<thead>
<tr>
<th>Source</th>
<th>Deviance</th>
<th>DOF</th>
<th>Deviance/DOF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global model</td>
<td>1.660.164</td>
<td>32.000</td>
<td>51.880</td>
</tr>
<tr>
<td>GWR model</td>
<td>281.060</td>
<td>6.661</td>
<td>42.192</td>
</tr>
<tr>
<td>Difference</td>
<td>1.379.104</td>
<td>25.339</td>
<td>54.427</td>
</tr>
</tbody>
</table>

Table 5 shows that the deviance/dof difference of 54.427 and \( \chi^2_{(26; 0.05)} = 38.8851 \), then reject \( H_0 \) because it can be concluded that in the model the number of pulmonary tuberculosis patients is infected with \( Y_i \) per district/city East Java The year 2015 is GWPR

Next is the partial test of GWPR model parameter significance to find out which parameters significantly influence the number of infected pulmonary tuberculosis patients with \( Y_i \) in each observation location. The hypothesis used is as follows:

\( H_0: \gamma_i(u, v) = 0 \)

\( H_1: \gamma_i(u, v) \neq 0; i = 1, 2, \ldots, 38; k = 1, 2, \ldots, 5 \)

With a significance level (α) of 5%, \( t_{(0.025;26)} = 2.055 \). Predictor variables that influence significantly on each location of observation with bandwidth size = 3 can be seen that all observation locations identified variables that significantly affect all districts/municipalities in East Java Province.

Discussion

There are several variables that indicate the relationship of almost no correlation that meets the poisson regression requirements. Percentage of poor and average of school population variable in each district in East Java.

Predictor variables that significantly influence each location of observation with bandwidth size = 3, it can be seen that all observation locations significantly identify the variables that affect in all districts in East Java province grouping 5 areas. Being a reference for the treatment of pulmonary tuberculosis.

Conclusions

Based on the results of the analysis and discussion, it can be concluded that the GWPR model is more appropriate to analyze pulmonary TB patients in East Java because it has a smaller AIC value. The dominant factor in influencing pulmonary tuberculosis in all districts in East Java is the most significant factor except Trenggalek district ratio of basic health facilities and percentage of school population and poor families, BTA +, HIV/AIDS incidence rate, incidence of diabetes mellitus, population density and power ratio health. Influencing pulmonary tuberculosis patients in 5 districts/cities in East Java.

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Ethical Clearance: Ethical reviewed has been done at the ethical standards of the Health Research Ethics Committee Faculty of Public Health Airlangga University.

REFERENCES


Influence of Attitude Toward Behavior and Subjective Norms in Predicting Intention to Provide Healthy Foods on Child Stunting Under Five Years Old

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ABSTRACT

The immediate cause of child stunting under five years old was lack of food intake and infectious disease\(^{(3)}\). Providing healthy food on child stunting has been shown to influence the growth of body height\(^{(1)}\). This study aims to determine the effect of attitudes toward behavior and subjective norms in predicting intention of caregivers to provide healthy foods on child stunting under five years old. This research was an observational analytic with cross sectional design. The study was conducted on 137 caregivers of child stunting under five years old in Tuban District. Data were collected by interviews using questionnaires.

Data analysis was using cross tabulation to know the frequency of behavioral beliefs, evaluation of behavioral outcomes, attitude toward behavior, normative beliefs, motivation to comply, subjective norms, and intention to provide healthy food on child stunting under five years old. Then data analysis using logistic regression to know the influence of attitude toward behavior and subjective norms in forming intention to give healthy feeding on child stunting under five years old.

The results obtained that most of caregivers have supportive attitude toward behavior, strong behavioral beliefs, strong evaluation of behavioral outcomes, weak subjective norms, weak normative beliefs, strong motivation to comply, and strong intention. Attitude toward behavior has strong influence on intention forming to provide healthy foods. Attitude toward behavior was the strongest predictor in forming intention to provide healthy foods on child stunting under five years old. Recommendation of this research was to provide counseling on the social environment of caregivers, especially to grandmother related to nutrition and child stunting.

Keywords: Attitude Toward Behavior, Subjective Norms, Intention, Healthy Foods.

Introduction

Malnutrition was a condition of inadequate food nutrition substances that entered to the body. Malnutrition occurs in many developing and poor countries. One of the most common forms of malnutrition was stunting. Child stunting under five years old was a long-term manifestation of malnutrition that can lead to decrease learning ability, increased risk of degenerative disease, poor health and reduced productivity.\(^{(1)}\)

Prevalence of child stunting under five years old in Indonesia in 2013 reached to 37.2%. This number was increased when compared to 2010 and 2007 prevalences. Tuban district was one of the areas in Indonesia with high prevalence of child stunting under five years old. In 2016, prevalence of child stunting under five years old in Tuban district has reached 28% of all child under five years old in Tuban district.\(^{(2)}\)

The global target of handling child stunting under five years old problem was decreased 40% prevalences of child stunting in the world. Framework for action to address this problem were by providing complementary food with high diversity in child stunting, and consumption foods from animal source. It was proven to increase linear growth in child stunting.\(^{(1)}\) The immediate cause of child stunting under five years old due to insufficient dietary intake, and infectious diseases.\(^{(3)}\) The majority of mothers in Tuban district have not provided healthy food to their child stunting, it will worsen the
nutritional status of children. This condition can be caused by food insecurity at the household level, and poor feeding practices. Children who do not get enough nutrient intake will be disturbed in growth. A girl with stunting status will grow into a mother with a short body structure, and then will increase the risk of offspring from this mother will have low birth weight that became one of the factors causing stunting problems in children. Therefore, it takes effort to break the chain of child stunting from mothers who have a history of stunting. The efforts to improve nutritional status of child stunting under five years old were by providing healthy feeding consumption to child stunting every day.

Intention was strong predictor of behavior. Intention to implementation of behavior was assumed to be a follow-up based on beliefs to carry out the behavior. Intention to carry out the behavior can be influenced by attitudes toward behavior, subjective norms, and perceptions of behavioral control. Therefore, this study aims to determine the effect of attitude toward behavior and subjective norms in predicting intention to provide healthy food on child stunting under five years old.

Materials and Method

This research was an observational analytical study with cross-sectional design. The research location was conducted in working area of Puskesmas Singgahan in Tuban District, East Java, on December 2017 until April 2018. The sample in this study was 137 caregivers of child stunting under five years old.

The independent variables in this research were subjective norms and attitudes towards behavior. Then for the dependent variable was intention to provide healthy food on child stunting under five years old. Subjective norms were measured using normative beliefs and motivation to comply indicators, then attitudes were measured using behavioral beliefs and evaluation of behavioral outcomes. All data were collected through interviews using a questionnaire guide.

Findings

Table 1: Distribution Frequency of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Beliefs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>112</td>
<td>82</td>
</tr>
<tr>
<td>Weak</td>
<td>25</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 2: Influence of Attitude Toward Behavior and Subjective Norms on Intention to Provide Healthy Feeding

<table>
<thead>
<tr>
<th>Variable</th>
<th>α</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Toward Behavior</td>
<td>0,05</td>
<td>0,000</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>0,05</td>
<td>0,192</td>
</tr>
</tbody>
</table>

Behavioral belief was a belief about the implementation of behavior associated with positive or negative feelings to execute it. Based on Table 1, it could be seen that most of caregivers have strong behavioral beliefs. It was means that the caregivers believe by providing healthy foods to child stunting under five years old was good behavior. Performing the healthy feeding behavior to child stunting can provide adequate nutrients for the child daily activities. A pregnant woman belief that eating a healthy balanced diet behavior will ensure getting all nutrients for their health, ensure have a healthy baby, because the baby getting all the nutrients it needs. The strong beliefs of caregivers were motivated by good knowledge of nutrition. Most of the caregivers of child stunting under five years old receive nutritional information through health service posts in each village at working area of Puskesmas Singgahan.

Evaluation of behavioral outcomes was assessed of the outcome of a behavior. Most of caregivers have strong evaluation of behavioral outcomes. It means, by providing healthy foods to child stunting
will be beneficial for the health of children. Adequate consumption of vegetables and fruits with high diversity were very recommended as part of healthy diet.\(^8\) The caregivers of child stunting have explained that giving healthy feeding to child stunting can improved their health status, maintain and increase the immunity of children, making the growth optimally, can be used as learning healthy food consumption early, and can increase knowledge and ability for the caregivers to process healthy food.

Attitude toward behavior was define as the degree to which a person has a support or not support evaluation or an appraisal of the behavior outcome in a question.\(^5\) The equation to measure attitude toward behavior as below:

\[ A_g = \sum b_i e_i \]

Score of attitude toward behavior was obtained from the sum of behavioral belief multiplied by evaluations of behavioral outcomes.\(^5\)

Based on table 1, most of the caregivers have support attitude to give healthy feeding behavior on child stunting under five years old. This supportive attitude suggests that the majority of caregivers have a positive perception to provide healthy feeding behavior. Providing dietary education can improve the attitudes toward healthy feeding behavior on children.\(^9\) The caregivers have a supportive attitude toward healthy feeding on child stunting, because of getting information from mother who have provided healthy feeding, and feel the benefits to the health status of her child.

Attitudes toward behavior have a significant influence (p-value 0.000 < \(\alpha\) 0.05) on the intention to provide healthy feeding on child stunting under five years old. This finding was similiar to the study by Dermot et al which aims to promote the selection of healthy food consumption for people with health problems. The results of this study indicate that attitude toward behavior was the strongest predictor affecting intention in food consumption.\(^10\) So it's necessary to designed a program that aims to improve the positive attitude toward behavior of someone to be able to carry out the behavior.

Normative Beliefs was a beliefs about whether each referent in social environment approves or disapproves to provide healthy feeding behavior on child stunting.\(^6\) Based on table 1, it could be seen that most of the caregivers have weak normative belief to provide healthy feeding. It means that the social environment of caregivers did not approve to provide healthy feeding on child stunting. The social environment of caregivers was comes from grand mother, husbands, neighbors, or health workers in health services. A child stunting that living with grandmother will experience delayed initiation of breastfeeding, discarding colostrum, and delayed introduction of complementary feeding.\(^11\) The amount and frequency of foods to be given to child stunting by grandmothers was inappropriate. Grandmothers have an important role in decision making by caregivers in feeding behavior on child stunting.

Motivation to comply was define as motivation to do what each referent or groups thinks about behavior.\(^6\) Most of caregivers have strong motivation to comply with their social environment. Caregivers will tend to follow what their social environment think or did, in this case to provide healthy feeding on child stunting. Most of caregivers will follow the grandmother’s recommendation in child feeding practice. Majority of caregivers more follow the grandmother’s opinion and suggestions in childcare activities and less in household work, like keeping the child clean, and playing with the child.\(^11\) A study in rural Gambia revealed that presence of maternal grandmother was more influential in decision making of feeding practice to child.\(^12\) Respecting and following the opinions of grandmother or older people was a culture for people living in the village. The grandmother or older person was considered to have better experience and knowledge in carrying out the feeding practice on child. So the majority of caregivers living in the village will follow what the grandmother suggested in feeding practice on a child, including child stunting.

Subjective Norms was an assessment of the extent to which important others would approve or disapprove of performing a given behavior.\(^5\) In this study, the majority of caregivers have weak subjective norms for implementing healthy feeding behaviors in child stunting under five years old. It means that most of them didn’t approve performing healthy feeding behavior on child stunting, because of the influence of their social environment factor that didn’t approve performing healthy feeding behavior on child stunting. In a study of the influence of grandmother in child care in India explained that grandparents provide an important role in feeding their grandchildren, but usually the role of
grandparents in general was provide unhealthy food for their grandchildren. Grandparents were often discussed as one of the main drivers of unhealthy child food conditions, but in some efforts to increase the consumption of healthy foods for child under five years old, the role of grandparents was often ignored. Weak of subjective norms due to influence from the opinion of grandparents who didn’t approve to provide healthy feeding on child stunting. Most of Grandparents assume that child stunting was not a nutritional problem, but it was due to heredity. So if a child stunting given healthy feeding every day, it will not affect with the nutritional status of child stunting. The equation to measure subjective norms as below:

$$SN = \sum n_i m_i$$

Based on the equation, score of subjective norm was obtained by summing the result of multiplication between normative beliefs and motivation to comply.

Based on table 2, it could be seen that subjective norms has no significant influence (p-value 0.192 > α 0.05) on intention to provide healthy feeding behavior on child stunting under five years old. The same results of a study conducted at the University of Parma, Italy which explains that subjective norms did not become a significant predictors of intention to eating novel food products containing insect flour.

Intention was the core construction in carrying out a behavior. The possibility of behavioral performing will be increased if it has a high intention to perform the behavior. Intention was assumed to be follow up based on beliefs to perform a behavior. Intention was influenced by three main components, such as attitude toward behavior, subjective norms, and perceived behavior control. Most of the caregivers have strong intention to perform healthy feeding behavior on child stunting under five years old. The intention to perform healthy feeding on child includes intention to pay attention the type of food, the frequency of eating, the suitability of child’s age with the foods, and provide high diversity foods to child stunting.

**Conclusion**

The result of the study found that most of caregivers have support attitude (61%) to give healthy feeding behavior on child stunting under five years old. But most of caregivers have weak subjective norms (81%) to give healthy feeding behavior on child stunting under five years old. Attitudes toward behavior have a significant influence (p-value 0.000 < α 0.05) on the intention to provide healthy feeding on child stunting under five years old. Then, subjective norms has no significant influence (p-value 0.192 > α 0.05) on intention to provide healthy feeding behavior on child stunting under five years old. Recommendation of this research is to provide counseling on the social environment of caregivers, especially to grandmother related to nutrition and child stunting.

**Conflict of Interest:** All authors have no conflicts of interest to declare.

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**Ethical Clearance:** This study was approved by Ethical Commission of Health Research, number 119-KEPK, Faculty of Public Health, University of Airlangga, Surabaya.

**REFERENCES**


Employees’s Perspective on Istawa Basic Value in Lamongan Muhammadiyah Hospital

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ABSTRACT

Human resources are the most important part of the hospital. Lamongan Muhammadiyah Hospital makes an organizational culture which called ISTAWA as the foundation of employees in serving patients. This study aims to determine the level of knowledge and understanding of employees to the ISTAWA basic value in Lamongan Muhammadiyah Hospital. This survey conducted from August to November 2016 and involved 84 employees of Lamongan Muhammadiyah Hospital. Research instrument through questionnaire. Data analysis was done descriptively. This study shows that most (67%) of employees do not know the ISTAWA basic value. Information about the value obtained by employees from direct supervisors (76%), regular unit meetings (10%), SDI 7%, and Director (7%). Understanding the meaning to the ISTAWA basic value from employees of Lamongan Muhammadiyah Hospital which is the highest lies in the aspect of sincerity. This research recommends that the management of Lamongan Muhammadiyah Hospital make socialization program and internalization of the ISTAWA basic value to all employees so that the value can be an organizational culture that is implemented in every services to patient.

Keywords: Employees’s Perspective, ISTAWA Basic Value, Organizational Culture

Introduction

Human resources becomes an important asset in an organization such as a hospital. Human resources as an actor because it plays a role in the implementation of policies and operational activities in the hospital. Effective human resource management can provide valuable capital so that patients get the best service. Each founder of the hospital must grow the basic values to all employees to form an organizational culture. Organizational culture serves as a foundation for employees in providing excellent service to all patients.

Observable organizational culture is referred to as organizational behavior. Organizational behavior affects the performance of employees in providing services to patients. If the organizational culture is successfully built, then the performance of employees in serving patients will be more optimal. Organizational culture is a strategic aspect to be studied in an effort to increase patient satisfaction.

Lamongan Muhammadiyah Hospital organizes organizational culture along with the owner of the foundation along with the manager. The values made refer to Muhammadiyah guideline and missionary journals by previous founders and aktivists of Muhammadiyah. The set base value is known as ISTAWA.

The value dissemination program has been done by Lamadah Muhammadiyah Hospital management with the hope that corporate value can serve as the principal foundation in every employee action so that organizational culture is expected to be created. Internalization effort of value of ISTAWA must be implemented comprehensively so that the implementation process can be successful. This study aims to examine the level of knowledge, understanding and implementation results of the internal effort of ISTAWA basic values in Lamongan Muhammadiyah Hospital.

Method

This research is an observational study with cross sectional design. This study lasted for 3 months, from August to September 2017 in Lamongan Muhammadiyah Hospital. This research is based on...
survey through questionnaires to 84 employees of Lamongan Muhammadiyah Hospital.

Determination of the respondents randomly or simple random sampling. The research questionnaire was also tested on the validity and reliability of the Jemursari Islamic Hospital in Surabaya due to consideration of the context and the homogeneous situation with the research location. The research variables include knowledge, understanding and result of implementation of effort of internalization of ISTAWA base value in Lamongan Muhammadiyah Hospital. The process of data analysis is done descriptively.

Results and Discussion

Overview of ISTAWA basic value: The base value is the criterion, standard, or principle used to determine behavior, reflecting the belief that determine what should and should not be done. The value formulated by Lamongan Muhammadiyah Hospital is expected to be owned by all employees. Lamongan Muhammadiyah Hospital started from the beginning of January 2013 and determined that the base value is formed from the acronym word of ISTAWA. Once the base value is selected by the managers and owners of the hospital, the Director determines the underlying value and makes a simple definition of each predefined base value. No code of conduct has been made from the base values. The basic value is taken from the acronym word ISTAWA in the form of itqon, istiqomah, ikhlas, shobru, tartibu, and waqtihi. This value has a sense that is translated again in accordance with organizational culture.

<table>
<thead>
<tr>
<th>Itqon</th>
<th>Human resources have competence according to applicable professional standard and carry out activities according to the latest science development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Istiqomah</td>
<td>Health services are carried out continuously based on the worship of the teachings of Islam, always follow the progress of science and make improvements and innovation in a sustainable manner according to customer needs</td>
</tr>
<tr>
<td>Ikhlas</td>
<td>Providing safe, effective, and friendly service for pleasing Allah</td>
</tr>
</tbody>
</table>

Changes in organizational culture are necessary because of cultural adjustments to address organizational challenges, change environments and achieve organizational goals more quickly. For that to be conducted a discussion involving members of the organization especially those who bring impacts as drivers of change such as owners, directors and managers.

Relation of basic values and organizational culture: The result of survey of organizational culture of Lamongan Muhammadiyah Hospital at employee level that the culture that is currently being applied in Lamongan Muhammadiyah Hospital is hierarchical culture, whereas the culture which become the expectation of Lamongan Muhammadiyah Hospital employee is clan culture. Measurement of OCAI culture is done to determine the steps in conducting Measurement of OCAI culture is done to determine the step in doing effort of internalization of ISTAWA culture in Lamongan Muhammadiyah Hospital so that approach and program can refer to expectant culture of Lamongan Muhammadiyah Hospital, Clan.

The things needed to support the change of organizational culture type from hierarchical organizational culture to group organizational culture is a formal statement of organizational philosophy, mission, vision, values and materials in the process of recruitment, selection and socialization; role models or role models for employees, training programs, teaching, and guidance by managers and supervisors; Commitment and employee participation to seek ways of organizing and managing to gain competitive advantage.

Employee knowledge of ISTAWA basic value: Based on the results of the questionnaire about the level of knowledge of employees about the baseline value and then made a comparison of the level of knowledge about the basis of service units and non services as shown in Figure 1.

### Table 1: ISTAWA Basic Value

<table>
<thead>
<tr>
<th>Shobru</th>
<th>Provide a friendly service, not easily angered, serve with great pain and patience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tartibu</td>
<td>Providing health services in accordance with professional standards or established procedures</td>
</tr>
<tr>
<td>Waqtihi</td>
<td>Providing health services in accordance with the schedule or time set</td>
</tr>
</tbody>
</table>
Figure 1: Employee Knowledge Level

Figure 1 shows the level of knowledge of Muhammadiyah Hospital Lamongan employee to the basic value ISTAWA still low. As many as 67% of employees stated not know. Based on the results of questionnaires on information sources about ISTAWA's stability can be seen in Figure 2.

Figure 2: Information Source of ISTAWA

Figure 2 shows the largest role holder in the socialization program is from the direct supervisor. This can be a capital in the effort to internalize the basic value of ISTAWA, it is expected that the boss can be a role model for the employees with the level of office below. To analyze further factors affecting the process of planting the basic value of ISTAWA in Lamongan Muhammadiyah Hospital needed analysis of each of ISTAWA's own basic values, the type of organizational culture that has been established and expected in Lamongan Muhammadiyah Hospital as well as preparing the grand design effort to build the ISTAWA culture in Muhammadiyah Hospital.

Conclusion

This study concludes that knowledge and understanding of the meaning of employees to the basic value ISTAWA not comprehensive. Therefore, the recommendation of this research is Muhammadiyah Hospital management Lamongan need to arrange socialization program and internalization of basic value of ISTAWA to all employees so that the value can become organizational culture that implemented in every service.

Conflict of Interest: The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

Source of Funding: All sources of funding from author.

Ethical Clearance: This study get the ethical approval from ethical committee in Faculty of Public Health, Universitas Airlangga.

REFERENCES

Determinant of Waste Causes in Outpatient and Inpatient Rooms of Surabaya Islamic Hospital

Puryanti

Master Program in Hospital Administration, Universitas Airlangga, Indonesia

ABSTRACT

Hospitals as healthcare providers are demanded more competitive in the era of national health insurance. Therefore, the hospital faces the challenges of improving the quality of health services by using available resources. The study aims to identify waste in outpatient and inpatient rooms of Surabaya Islamic Hospital. The descriptive study involved 90 patients from outpatient and inpatient rooms. The study found waste by defect category, waiting time, non-utilize talent, transportation, inventory, motion, and extra processing based on business process analysis. Category of waste over production not found. The causes of the occurrence of waste most comes from the man, material, and method factors. Program recommendations include scheduling patient-based arrival of service group, visita scheduling and polyclinic service and temporary payment method change, for inpatient program program consisting of 5R program implementation, rearranging standard operating procedure of patient’s diet information, improvement of prescribing system for patient and standard operating procedure rearrangement return of insurance patients.

Keywords: management, waste, effectivity, efficiency, health service

Introduction

In the era of National Health Insurance, competition in healthcare business is increasingly competitive so hospitals are increasingly striving to improve the quality of services through effective and efficient resource management. Hospitals in the face of competition are required to always ensure the level of effectiveness and efficiency at each stage of the service process in order to be able to produce superior service quality, ensure patient safety, and use appropriate resources by minimizing cost.

Table 1: Outpatient Visits 2015-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>General n</th>
<th>General %</th>
<th>Board of National Health Insurance (BPJS) n</th>
<th>BPJS %</th>
<th>Insurance n</th>
<th>Insurance %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>42,379</td>
<td>31,4</td>
<td>62,343</td>
<td>46,2</td>
<td>30,123</td>
<td>22,3</td>
</tr>
<tr>
<td>2016</td>
<td>38,149</td>
<td>27,5</td>
<td>88,049</td>
<td>63,5</td>
<td>12,289</td>
<td>8,8</td>
</tr>
<tr>
<td>2017</td>
<td>20,849</td>
<td>13</td>
<td>129,36</td>
<td>81</td>
<td>7,816</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: medical record

During 2015-2017, the percentage of patients with BPJS increased from 63.5-81% of general patients. The challenge facing hospitals in the face of increasing BPJS patients is the efficiency in managing hospitals without necessarily reducing the quality of patient care. If the hospital does not perform efficiently well it will greatly affect the financial of the hospital. Another problem faced by Surabaya Islamic Hospital is the decline in hospital profit margin for three consecutive years, since 2015-2017.

The decline in profit margin causes hospitals to work to improve the efficiency of health services by implementing lean hospital management. Therefore, this
study was conducted to identify waste in outpatient and inpatient of Surabaya Islamic Hospital.

**Method**

Descriptive study with cross sectional design was conducted in September-October 2017 at Surabaya Islamic Hospital. 90 patients from outpatient and inpatient selected by simple random sampling, to be involved as respondents. Data obtained through in-depth interviews, observation and documentation.

**Results and Discussion**

**Business process and waste analysis in outpatient:**
The outpatient room of Surabaya Islamic Hospital is under the Head of Medical Services, included several poly such as maternal and child health, dental, early detection clinic and child growth, physiotherapy, and specialists poly

The report on service quality indicators in outpatient is well achieved. The waiting time is less than 30 minutes according to predefined standards. The waiting time calculation begins when the patient is called for an examination and action from a specialist until the patient is completed and goes to the investigation or goes to the pharmacy unit to take the drug. The wait time calculation illustrates how long the service delivery process is by doctors and nurses who are part of the processing time. Some hospitals, outpatient service waiting times are set when the patient completes the registration until he/she receives a doctor’s service\(^4,5\).

Observation of outpatients without disaggregating general patients and BPJS patients and not distinguishing patients with investigational and nonprivileged patients. Observations were performed on patients in general poly, surgical poly, interna medicine poly, poly neurons, ENT polymers and obgyn poly. Observations have been made since the patient arrives until the patient returns, starting with the patient coming in, picking up the queue number, filling out the medical record file request form, waiting for the registration, registering, waiting to get the doctor’s services, obtaining services and acting, conducting investigations in the laboratory and or radiology, make payments at the checkout and take drugs in the pharmacy unit. Activities carried out by such patients, will be described further in the value stream mapping chart in the outpatient unit\(^6\).

### Table 2: Category of Outpatient Activities

<table>
<thead>
<tr>
<th>Process</th>
<th>Sub-Process</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The patient came</td>
<td>Take queue number</td>
<td>VA</td>
</tr>
<tr>
<td></td>
<td>Fill out the patient’s medical record file request form</td>
<td>NVAN</td>
</tr>
<tr>
<td></td>
<td>The process of retrieving medical record files</td>
<td>NVA</td>
</tr>
<tr>
<td>Registration</td>
<td>Waiting for the registration queue</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Input data participation</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Print SEP</td>
<td>x</td>
</tr>
<tr>
<td>Examination of doctor</td>
<td>Waiting for a doctor</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Anamnesis</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Physical examination</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Action and therapy</td>
<td>x</td>
</tr>
<tr>
<td>Supporting investigation</td>
<td>Laboratory examination</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Radiological examination</td>
<td>x</td>
</tr>
<tr>
<td>Patient Returning</td>
<td>Reception</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Medicine preparing</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Waiting for medicine</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Getting medicine</td>
<td>x</td>
</tr>
</tbody>
</table>

VA: value added, NVAN: necessary but non value added, NVA: non value added
The observation result in value stream mapping shows the category of waste that can be identified based on the business process and presented in table 3.

**Table 3: Category of Outpatient Waste**

<table>
<thead>
<tr>
<th>Waste</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting Time</td>
<td>Waiting for registration</td>
</tr>
<tr>
<td></td>
<td>Waiting for a doctor</td>
</tr>
<tr>
<td></td>
<td>Waiting for medicine</td>
</tr>
<tr>
<td></td>
<td>Waiting for laboratory results</td>
</tr>
<tr>
<td>Transportation</td>
<td>General patient three times to the cashier</td>
</tr>
</tbody>
</table>

**Table 4: Category of Inpatient Activities**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Treatment</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services when patients come</td>
<td>Hand over of patient between nurses and hospitalized nurses</td>
<td>VA</td>
</tr>
<tr>
<td></td>
<td>Hand over patient status</td>
<td>NVAN</td>
</tr>
<tr>
<td></td>
<td>Patient orientation</td>
<td>NVA</td>
</tr>
<tr>
<td></td>
<td>Reexamination by nurse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nursing care</td>
<td></td>
</tr>
<tr>
<td>Inpatient services</td>
<td>Nursing actions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Visiting by doctor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supporting services (laboratory, radiology)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pharmaceutical services</td>
<td></td>
</tr>
<tr>
<td>Patient service before out of hospital</td>
<td>Statement of out of hospital by doctor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cash payment for general patients</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verification for insurance patients</td>
<td></td>
</tr>
</tbody>
</table>

VA: value added, NVAN: necessary but non value added, NVA: non value added

Based on observations depicted in value stream mapping in inpatient wards can be identified in the business process presented in table 5.

**Table 5: Category of Inpatient Waste Room**

<table>
<thead>
<tr>
<th>Waste</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion</td>
<td>Taking medical records</td>
</tr>
<tr>
<td>Inventory</td>
<td>The patient’s food is not eaten because the patient is home</td>
</tr>
<tr>
<td>Extra Processing</td>
<td>Double drug between UDD and prescribing from doctor</td>
</tr>
<tr>
<td>Waiting time</td>
<td>Waiting for confirmation from the insurer</td>
</tr>
</tbody>
</table>

Waste motion, the movement that should not be done by the officer when looking for medical record documents, due to the arrangement of files that are not neatly arranged\(^9\). Waste inventory, ie the food of the patients presented is not eaten by the patient because the patient has gone home or out of hospital\(^7\). Waste extra processing, which is the existence of a double drug patients because doctors prescribe medication prepared by pharmacy with UDD program. Waste waiting time, which is waiting for the administrative process for patients with insurance payment guarantee, diakeranakan verifier of the insurance\(^10\).

**Business process and waste analysis in inpatient ward:** The inpatient room has 111 bed facilities with 6 units Muzdalifah room, 10 units Shofa room, 6 units of Tan’im room, 18 units of Mina room, Marwah room 9 units, Marwh room 6 units, Multazam room 12 units, Arofah 8 units, Ismail Hijr room or 21 units bnak room and Zam-Zam room or nursery 10 units.

During the study, observation of inpatient services in Marwah and Hijr Ismail rooms was conducted. Observations included patient flow, inpatient status file flows, and staff flow in the inpatient unit. Activities carried out by the patient will be described further in the value stream mapping chart in the inpatient unit. All patient service activities are presented in Table 4.

**Conclusion**

The study found waste by defect category, waiting time, non utilize talent, transportation, inventory, motion,
and extra processing based on business process analysis. Category of waste over production not found. The most likely cause of waste occurrence is due to man, material, and method factors. Recommendation programs offered in outpatient room, including scheduling patient-based arrival of service group, visite scheduling and polyclinic service and temporary payment method change, for inpatient program program consist of implementation of 5R program, re-arranging standard operating procedure of patient’s diet information, improvement of prescribing system for patients and re-arrangement of standard operating procedure for the return of insurance patients.

Conflict of Interest: The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers’ bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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Ethical Clearance: This study get the ethical approval from ethical committee in Faculty of Public Health, Universitas Airlangga.

REFERENCES
Satisfaction Assessment on Healthcare Service of COB Healthcare Social Security Agency Patient in Hospital X

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ABSTRACT

Background: Coordination of Benefit (COB) is a process of two or more insurers who warrant the same person for the same health insurance benefit. COB Healthcare Social Security Agency patient’s visit has been increasing in the last 3 years but the percentage of healthcare services utilization was below the normative standard (10.4%). This research aimed to assess satisfaction of COB Healthcare Social Security Agency patient in Hospital X.

Method: This research conducted on 28 respondents as the research sample which visited the outpatient unit in Hospital X. This was descriptive analytic research with cross sectional design.

Results: Research result showed that reliability and assurance indicator of COB Healthcare Social Security Agency patient in Hospital X satisfaction categorized as bad while in tangible, empathy and responsiveness indicator categorized as good or the patient satisfied.

Conclusion: Research result showed that Hospital X should increase the satisfaction of health services in reliability and assurance of COB Healthcare Social Security Agency patient. The result could be used as an evaluation related to the healthcare service utilized by the COB Healthcare Social Security Agency patient in Hospital X. Research from this research hopefully could increase the visit and utilization of healthcare services by the COB Healthcare Social Security Agency patient in Hospital X.

Keyword: Coordination of Benefit, healthcare, hospital, patient satisfaction, utilization

Introduction

Coordination of Benefit (COB) is a process of two or more insurers who warrant the same person for the same health insurance benefit(1). Healthcare Social Security Agency is an agency which managed the national health insurance in Indonesia(2). Hospital X already cooperated with the Healthcare Social Security Agency since 2014. Healthcare Social Security Agency already applied Coordination of Benefit (COB) with private health insurance (commercial insurance) since 2015. Hospital X has been cooperating with a few of company which warrant COB Healthcare Social Security Agency since 2015. COB Healthcare Social Security Agency patient’s visit has been increasing in the last 3 years from 10 visits become 95 visits. The visit increasing did not mean that the utilization of the healthcare services also increase. Percentage of COB Healthcare Social Security Agency patients showed in Table 1.
Table 1: Percentage of Patient Visit Based on The COB Warrant of Healthcare Social Security Agency in 2015 – 2017

<table>
<thead>
<tr>
<th>Warrantor Company</th>
<th>Cooperation Time</th>
<th>Number of Employee</th>
<th>Semester</th>
<th>Visit</th>
<th>Total Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>n</td>
</tr>
<tr>
<td>PT. Yakes Telkom</td>
<td>December 2015</td>
<td>811</td>
<td>1st</td>
<td>ER</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2nd</td>
<td>Outpatient</td>
<td>46</td>
</tr>
<tr>
<td>PT. PJB Services</td>
<td>July 2017</td>
<td>377</td>
<td>1st</td>
<td>ER</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2nd</td>
<td>Outpatient</td>
<td>1</td>
</tr>
<tr>
<td>PT. Trakindo</td>
<td>August 2016</td>
<td>130</td>
<td>1st</td>
<td>ER</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2nd</td>
<td>Outpatient</td>
<td>-</td>
</tr>
<tr>
<td>PT. POS</td>
<td>September 2017</td>
<td>143</td>
<td>1st</td>
<td>ER</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2nd</td>
<td>Outpatient</td>
<td>-</td>
</tr>
<tr>
<td>PT. Djarum</td>
<td>July 2016</td>
<td>140</td>
<td>1st</td>
<td>ER</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2nd</td>
<td>Outpatient</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1601</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Based on Table 1, it showed that visits of patients from company with COB Healthcare Social Security Agency increased in 2017 but the utilization of healthcare services in ER, Outpatient Unit, and Inpatient Unit categorized as low. The low utilization indicator in accordance with the result of Riskesdas (Basic Health Research)(3) which showed that 10.4% Indonesian citizen in 1 month utilize outpatient service, and 2.3% utilize inpatient service. This research aimed to assess satisfaction of COB Healthcare Social Security Agency patient in Hospital X.

Method

This was descriptive analytic research with cross sectional design. This research conducted in Hospital X in January until May 2018. Sample taken was 28 respondents with purposive sampling technique. Respondent of this research was patient which have been utilize the healthcare services in Hospital X. Instrument used in this research was questionnaire. Data collected will be analysed descriptively.

Result and Discussion

Indicator of the satisfaction assessment of COB Healthcare Social Security Agency patient in Hospital X including reliability, assurance, tangibles, empathy and responsiveness. The score of each indicator shown in Table 2.

Table 2: Score of satisfaction assessment of COB Healthcare Social Security Agency patient in Hospital X

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Good</th>
<th>%</th>
<th>Bad</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td></td>
<td>f</td>
<td></td>
<td>f</td>
</tr>
<tr>
<td>Reliability</td>
<td>10</td>
<td>35,7</td>
<td>18</td>
<td>64,3</td>
<td>28</td>
</tr>
<tr>
<td>Assurance</td>
<td>13</td>
<td>46,4</td>
<td>15</td>
<td>53,6</td>
<td>28</td>
</tr>
<tr>
<td>Tangibles</td>
<td>26</td>
<td>92,9</td>
<td>2</td>
<td>7,2</td>
<td>28</td>
</tr>
<tr>
<td>Empathy</td>
<td>22</td>
<td>78,6</td>
<td>6</td>
<td>21,4</td>
<td>28</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>23</td>
<td>82,1</td>
<td>5</td>
<td>17,9</td>
<td>28</td>
</tr>
</tbody>
</table>

Based on Table 2, showed that 50% COB Healthcare Social Security Agency patient in Hospital X evaluate reliability and assurance indicator of the health care service provided in the hospital categorized as bad while on tangibles, empathy and responsiveness indicator categorized as good.
Result of the research showed that reliability of the healthcare service provided by the hospital categorized as low. Reliability is one of the component which influenced the achievement of patient satisfaction(4). Among all the indicators, reliability is an important indicator. The poor result of reliability assessment could be one of the factors caused the low visit of COB Healthcare Social Security Agency patient in Hospital X.

Assurance is one of manifestation of behaviour and medical ethics of healthcare workers(5). Patient who have good impression of a healthcare by the healthcare workers would make a visit to that healthcare facility. The COB Healthcare Social Security Agency patient in Hospital X mostly stated that they could not meet the doctor freely to consult on their health issues. Patient who feel their health is guaranteed and will have good services on health care have great impact towards their visit and satisfaction(6). Patient who gets more time to meet and consult with a doctor will feel more satisfied(7).

Facilities and infrastructure in a healthcare facilities affect the assessment of service quality and patient satisfaction(5). Result showed that on tangible indicator assessment which including hospital’s facilities and infrastructure categorized as good. Only a few patient rate bad in tangibles indicators, they feel that some of hospital facilities still need some improvement.

Empathy in this research defined as modesty and giving more attention from the healthcare workers and other workers in the hospital. Result from this research showed that the empathy of the healthcare workers categorized as good. However, empathy is not always directly affect the patient satisfaction(8).

Responsiveness also one of the important component which affecting service quality and patient satisfaction in healthcare services(5). Component which provide services in hospital not only healthcare workers, but also the supporting workers in hospital. In this research, supporting workers which assessed by the patient was the administration staffs. Administration staffs who were responsive and have good empathy will increase the patient satisfaction(9).

**Conclusion**

Research result showed that reliability and assurance indicator of COB Healthcare Social Security Agency patient in Hospital X satisfaction categorized as bad while in tangible, empathy and responsiveness indicator categorized as good. This result could be used as an evaluation related to the healthcare service utilized by the COB Healthcare Social Security Agency patient in Hospital X.

**Conflict of Interest:** The authors have no conflict of interest in regard to this research.

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**Ethical Clearance:** This research has been proved by Health Research Ethics Committee, Faculty of Public Health Universitas Airlangga, Surabaya Indonesia Number 166-KEPK approved in April 5th 2018.

**REFERENCES**

Need and Demand for Eye Health Services: Experience from Surabaya

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ABSTRACT

Introduction: Healthcare institutions should take into account the needs of the community for the services provided to be effective. The research aims to find out the needs and needs of the public on eye health services in Surabaya.

Method: A survey involved 59 respondents from Wonokromo, Gayungsari, Jemursari, and Darmahusada in May of 2017. The research instrument was a questionnaire. Data analysis using descriptive statistical test.

Results: The research indicates that respondents need eye health services include good and professional services (27.10%), friendly human resources (32.20%), complete laboratory (39.00%), information system (44.10%), willingness to use (79.70%), good service system (37.30%), unreliable human resources and cost and distance factors respectively 28.80%, staff counseling (54.20%), treatment (76, 30%), puskesmas (30.50%), clinics (16.90%), taking medicine (36.00%), Eye Hospital in Undaan (37.00%), close to home (20.00%).

Conclusion: The study recommends that survey results can be used as a reference for hospital management in developing eye health services in line with community expectations.

Keywords: needs, demand, eye health service

Introduction

Each individual will strive to achieve the best health status by investing and consuming a number of health goods and services. So to achieve a good health condition is needed good health facilities as well. Viewed from an economic perspective, health is a determinant factor in the low quality of human resources. The microeconomic theory of demand for health care services states that prices are inversely proportional to the number of health service requests. This theory says that if health care services are normal good, the higher the family income the greater the demand for the health services. Conversely, if these types of health services are inferior good, increased family income decreases the demand for these types of health services.

Health factors are not inferior goods, because the higher the level of wealth will increase access to health care services. Other factors that tend to increase access to health care services are the age and number of health problems suffered. Health factors are closely related to the quality of human resources itself. The high quality of human resources is determined by health status, education and income level per capita. In the economic activities, the three indicators of human resource quality indirectly will also impact on the high level of human resource productivity, in this case especially labor productivity.

Healthcare services consist of two types: modern and traditional health services. Modern health care services are services that provide health services based on modern medical science, including private and government healthcare services. Health services must be felt by all levels of society and able to improve public health status. Then health services must also meet several requirements, including in accordance with the needs of users of the service and assured quality (accessibility, affordability, quality assurance).

Ronald Andersen et al. divide the factors that determine the utilization of health services into three predisposing factors, namely the tendency of individuals in using health services that are determined by a set of variables such as demographic conditions (age, gender, marital status), social circumstances (education,
race, family number, religion, ethnicity, occupation), emerging attitudes/beliefs (towards health services, labor, community behavior on health and ill health); supporting factors are factors that indicate an individual’s ability to use health services, as indicated by variables of family income sources (family income and savings, insurance or other sources of income, types of health services available and affordability of health services in terms of distance or service prices) the existing power in the community as reflected in the availability of health including the type and ratio of each service and its health personnel to the population, then the price of adequate health services and in accordance with their ability; the need factor is a factor that indicates an individual’s ability to use health services as indicated by the need for strong reasons such as the approach to perceived illness and the answer to the disease by seeking health services. Service to a disease is part of the need.

Laksono mentioned that there are several factors that influence the demand for health services, namely physiological needs, personal health status, tariff economic variables, community income, health insurance and health insurance, demographic and age variables, and gender. Surveys of needs based on needs and demand for eye health services in communities in the city of Surabaya were conducted to determine the needs and needs of the public on eye health services in the city of Surabaya.

Method

A survey involved 59 respondents with the criteria of living in the city of Surabaya and a minimum age of 17 years. Research respondents came from Wonokromo, Gayungsari, Jemursari, and Darmahusada areas. The survey was conducted in May of 2017. The research instrument was questionnaire and asked on the respondent. Data analysis using descriptive statistic test through frequency distribution table to know the need and demand of eye health service for Surabaya city population.

Results and Discussion

Characteristics of respondents: A detailed description of the sociodemographic picture of respondents can be seen in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>18</td>
<td>30.50</td>
</tr>
<tr>
<td>Female</td>
<td>41</td>
<td>69.50</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>5</td>
<td>8.50</td>
</tr>
<tr>
<td>Private employees</td>
<td>29</td>
<td>49.20</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>3</td>
<td>5.10</td>
</tr>
<tr>
<td>Civil servants</td>
<td>15</td>
<td>25.40</td>
</tr>
<tr>
<td>Business</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Retired</td>
<td>2</td>
<td>3.40</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>8.50</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tidak pernah sekolah</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Elementary school</td>
<td>2</td>
<td>3.40</td>
</tr>
<tr>
<td>Junior high school</td>
<td>5</td>
<td>8.50</td>
</tr>
<tr>
<td>Senior high school</td>
<td>12</td>
<td>20.30</td>
</tr>
<tr>
<td>Graduate of diploma</td>
<td>13</td>
<td>22.00</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>27</td>
<td>45.80</td>
</tr>
<tr>
<td>Family income (million)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1</td>
<td>8</td>
<td>13.60</td>
</tr>
<tr>
<td>1-5</td>
<td>34</td>
<td>57.60</td>
</tr>
<tr>
<td>5-10</td>
<td>14</td>
<td>23.70</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>3</td>
<td>5.10</td>
</tr>
<tr>
<td>Insurance ownership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45</td>
<td>76.30</td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>23.70</td>
</tr>
<tr>
<td>Type of insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td>44</td>
<td>97.77</td>
</tr>
<tr>
<td>Company insurance</td>
<td>1</td>
<td>2.33</td>
</tr>
<tr>
<td>Private insurance</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table 1 shows that most of the respondents were female (69.50%), worked as private employees (49.20%), had recent education from undergraduate (45.80%), earned 1-5 million in a month (57.60%), have insurance (76.30%), type of insurance from health insurance (97.77%).

Needs Analysis: The respondent’s need for eye health services is assessed based on several indicators, consisting of the need for services, human resources, completeness, facilities and infrastructure, the willingness to use the service, the reason for trust, the reason for mistrust, the type of information, the first action at the time of illness,
selected referral sites, first-time eye acts, ophthalmological services, and reasons for the selection of eye health services, are presented in Table 2.

<table>
<thead>
<tr>
<th>Table 2: Description of Respondent’s Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Good service and professional</td>
</tr>
<tr>
<td>Friendly human resources</td>
</tr>
<tr>
<td>Complete laboratory</td>
</tr>
<tr>
<td>Information systems</td>
</tr>
<tr>
<td>Willingness to use eye services</td>
</tr>
<tr>
<td>Good service system</td>
</tr>
<tr>
<td>Unreliable human resources</td>
</tr>
<tr>
<td>Cost and distance factor</td>
</tr>
<tr>
<td>Counseling officer</td>
</tr>
<tr>
<td>Medicated</td>
</tr>
<tr>
<td>Public health center</td>
</tr>
<tr>
<td>Clinic</td>
</tr>
<tr>
<td>Taking medication</td>
</tr>
<tr>
<td>Undaan Eye Hospital</td>
</tr>
<tr>
<td>Close to home</td>
</tr>
</tbody>
</table>

Table 2 explains that the majority of respondents expect to receive good and professional services (27.10%), friendly human resources (32.20%), complete laboratory (39.00%), information systems (44.10%), willingness to use health services eye (79.70%), good service system (37.30%), unreliable human resources, cost and distance factor (28.80%), counseling officer (54.20%), treatment (76.30%), public health center (30.50%), clinics (16.90%), taking medication (36.00%), Undaan Eye Hospital (37.00%), close to home (20.00%).

Based on the results of the survey can be concluded that the need for eye health services vary. The condition is influenced by several factors. Previous studies explain the factors that affect the needs of a society is the geographical conditions, the needs of people living in the village is different from the needs of people living in the city; civilization, the higher the civilization the higher the quality of goods needed; customs, community traditions affect the needs of society.

**Demand Analysis:** Respondent’s demand for eye health services is assessed based on several indicators, consisting of morbidity, general illness category, illness, history of healing, willingness to move to another health service, symptoms of eye diseases.

Table 3: Description of Respondent’s Demand

<table>
<thead>
<tr>
<th><strong>Category</strong></th>
<th><strong>n</strong></th>
<th><strong>%</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never get sick</td>
<td>55</td>
<td>93.20</td>
</tr>
<tr>
<td>Flu and fever</td>
<td>28</td>
<td>47.00</td>
</tr>
<tr>
<td>Last 3 months</td>
<td>28</td>
<td>47.50</td>
</tr>
<tr>
<td>Doctor</td>
<td>20</td>
<td>33.90</td>
</tr>
<tr>
<td>Heal</td>
<td>49</td>
<td>83.10</td>
</tr>
<tr>
<td>Want to move</td>
<td>46</td>
<td>78.00</td>
</tr>
<tr>
<td>The eyes are red and itchy</td>
<td>23</td>
<td>39.00</td>
</tr>
</tbody>
</table>

Table 3 shows that most of the respondents were ill (93.20%), flu and dementia category (47.00%), illness in the last 3 months (47.50%), choosing a doctor (33.90%), (83.10%), had a desire to move to another health facility (78.00%), had symptoms of red and itchy eyes (39.00%).

Similarly to demand, demand is also influenced by various factors such as consumer income, the intensity of consumer needs, tastes or habits, the price and availability of related products, the price of the goods themselves; total population; future price forecasts; income distribution; producer efforts to increase sales.

**Conclusion**

The tendency to seek health care solutions for the first time by visiting general practitioners. Tariff is a major consideration in determining the choice of health services. The first health-care institution is the Undaan Eye Hospital. Easy access to information is a top priority for non-medical services. The services of specialist doctors are a major requirement in hospitals. Expected tariff is reasonable tariff in accordance with the services provided from the respondents who had undergone inpatient treatment, choose a local hospital as an option in health services. Distance is the dominant factor in determining the choice of health services. The results of the previously described survey are part of the initial assessment activities that can be used as a reference for hospital management in developing eye health services in accordance with community expectations.

**Conflict of Interest:** The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

**Source of Funding:** All sources of funding from author.

**Ethical Clearance:** This study get the ethical approval from ethical committee in Faculty of Public Health, Universitas Airlangga.
REFERENCES


An Approach of Predisposing Factor to Increase Immunization Coverage

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¹Public Health Faculty, Airlangga University, Surabaya, Indonesia; ²District Surveillance Officer, Lumajang District Health Office, East Java, Indonesia

ABSTRACT

Background: Immunization for infants is a national program that should be given to all infants under 1 year of age. However in the last 3 years, coverage of basic infant immunization in Lumajang District still has not reached the target or below than 91.5%. This could be a potential outbreak of the vaccine preventable disease such as diphtheria and measles. Parents as a determinant of health decisions for children are the main actors to be approached by health workers.

Purpose: This study aims to identify predisposing factors that affect mother’s health behavior about immunization and the correlation with completeness of basic immunization.

Method: This is observational analytic study with cross sectional design. The sample was taken by proportionate stratified random sampling method with the sample size is 188 mothers. Predisposing factors in this study are age, number of children, education, knowledge, employment status and children parenting. Data collected using structured questionnaire.

Results: There are 122 children with complete basic immunization and 66 children was incomplete. There are significant correlations between education (P Value = 0.010) and mother’s knowledge (P Value = 0.000) with completeness of basic immunization. There aren’t any correlations between mother’s age, number of children, employment and children parenting with completeness of basic immunization.

Conclusion: Mother’s knowledge is predisposing factors that affect immunization behavior. To elevate achievement completeness of basic immunization, health worker must give enough information about benefit and also risk about immunization with social cultural approach in promoting immunization programs.

Keywords: Predisposing Factor, Knowledge, Immunization

Introduction

Almost all developing countries around the world have to face triple burden disease that is contagious diseases, non-communicable diseases and new emerging disease. Indonesia is also has some health problem to solve. Vaccine preventable disease such as diphtheria, pertussis and measles are still common happened in community. This is because the immunity is not yet established in the community.

Immunity is obtained from vaccination to some or all communities. Immunizations begin from infancy to adulthood to prevent people get ill from some vaccine preventable disease. The 0-1 year period is a period in which infants should be given 9 kinds of vaccine at certain intervals in accordance with the national program later called as basic immunization.

In the last three years, Lumajang district didn’t reach their target to make herd immunity in all villages. Immunization withdrawal are still occurs. Some issues were emerged such as health worker performance, stakeholder support and parents decision about
immunization. Parents are the ultimate decision makers and they responsible for all of their child’s health efforts.

Mother as a person closest to her child becomes an important factor in efforts to improve the completeness of basic immunization of infants. According to Green (1999) there are 3 factors that can affect people’s health behavior that is predisposing, enabling and reinforcing factor. Predisposing factors are internal factors of a person such as age, gender, education, knowledge, attitudes and values that can cause a behavior to occur.

The purpose of this study is to determine the predisposing factors that cause mother’s behavior in giving immunization to their children. Ages, number of children, education, knowledge, employment status, and baby care are the factors to be studied.

**Materials and Method**

This is observational analytic study with cross sectional design in Lumajang district of East Java, Indonesia. The sample is a mother with at least has one child younger than 3 years old. The sample was taken with stratified random sampling method. A total of 188 mothers became respondents.

Data were obtained from the interviews using a questionnaire. The data were processed using chi-square test SPSS 23.0 to see the frequency and correlation between predisposing factors consisting of age, education, knowledge, employment and parenting status with completeness of basic immunization.

### Results

**Table 1: Basic Immunization Distribution**

<table>
<thead>
<tr>
<th>Type of Vaccine</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn’t get vaccine</td>
<td>5</td>
<td>2.66</td>
</tr>
<tr>
<td>HB0</td>
<td>8</td>
<td>4.26</td>
</tr>
<tr>
<td>BCG+OPV 1</td>
<td>12</td>
<td>6.38</td>
</tr>
<tr>
<td>DPT-HB-HiB 1+OPV 2</td>
<td>12</td>
<td>6.38</td>
</tr>
<tr>
<td>DPT-HB-HiB 2+OPV 3</td>
<td>10</td>
<td>5.32</td>
</tr>
<tr>
<td>DPT-HB-HiB 3+IPV 4</td>
<td>19</td>
<td>10.11</td>
</tr>
<tr>
<td>MR</td>
<td>122</td>
<td>64.89</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The result shows that 122 children complete following immunization programs which get 9 type vaccines. 5 children didn’t get any vaccinations because refusal from their parents. Vaccination refusal was found to rely on multiple factors including cultural, emotional, religious, and social issues.[2]

Most immunization withdrawal occurs after the baby gets first, second or third stage DPT-HB-HiB vaccination. This is because some children have a fever after getting the vaccine so the mother decides not to follow the next vaccination interval. There are some mild problems (common) such as fever, redness and soreness where the shot was given. The risk of DPT vaccine causing serious harm or death is extremely small.[2]

Mother didn’t want their children became sick or weak after getting vaccination. Some parents who refuse or delay vaccines worried that their decisions may be putting their child at risk for infection.[4]

### Table 2: Distribution of predisposing factor and the correlation with completeness of basic immunization

<table>
<thead>
<tr>
<th>Predisposing factor</th>
<th>Completness of Basic Immunization</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Age (years)</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>11-20</td>
<td>4</td>
<td>26.7</td>
</tr>
<tr>
<td>21-30</td>
<td>36</td>
<td>35.0</td>
</tr>
<tr>
<td>30-40</td>
<td>23</td>
<td>36.5</td>
</tr>
<tr>
<td>&gt;40</td>
<td>3</td>
<td>42.9</td>
</tr>
<tr>
<td>Number of children</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1-2</td>
<td>55</td>
<td>34.8</td>
</tr>
<tr>
<td>&gt;2</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>Education</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Didn’t take a school</td>
<td>3</td>
<td>50.0</td>
</tr>
<tr>
<td>Primary School</td>
<td>30</td>
<td>53.6</td>
</tr>
<tr>
<td>Junior High school</td>
<td>13</td>
<td>26.0</td>
</tr>
<tr>
<td>Senior High School</td>
<td>17</td>
<td>30.4</td>
</tr>
<tr>
<td>Diploma and Bachelor</td>
<td>3</td>
<td>15.0</td>
</tr>
</tbody>
</table>
**Discussion**

From the table we can conclude that mostly mother is at their adult age to have married and children. In general, woman can think more wisely when they are at adult stage. It’s also show that mostly of them only has 1 or 2 child. They think have less children are good in social and economic. Because if they have more than 2 children, they have to give more attention and also have to spend more money for their daily need. The result shows there are no correlation between ages P value 0.630 (>0.050) and number of children that mothers have P Value 0.463 (>0.050) with completeness of basic immunization.

In education, mostly mother had get a 9 year basic education which is at least they graduate from junior high school. There are correlation between education and completeness of basic immunization with P Value 0.010 (<0.05). Higher their degrees in education, the chance of their children completeness of immunization are increase too. In line with others study, the association was significant and strongest among children of mothers with the lowest education level and may reflect the challenge of keeping accurate vaccination records when multiple providers are involved. [3]

When mother have enough education, they consider that giving basic immunization as a right choice in maintain and increasing children health. Education about herd immunity and local vaccination coverage could be a useful tool for increasing willingness to vaccinate. [9]

The result show that mostly mother’s knowledge is at intermediate and good level. There is correlation between mother’s knowledge levels with completeness of basic immunization P Value 0.000 (<0.050). These result has the same result with past study that there is a correlation between mother’s knowledge with complete basic immunization in infants. [8][11] Mother’s knowledge about immunization can change their behavior about giving immunization for their children.

Mother gets their knowledge about immunization mostly from health worker such as midwife in village or public health center. Health worker must give information equally between benefit and risk of immunization. Parents need information about risks of vaccination as well as the components and effectiveness of the vaccines, and that they would like to receive more detailed scientific information. [7]

Most mothers do not have a job with a percentage of 75.53%. They spend their entire time in home while caring their children. This is in line with the result that most mothers take care of their own children (82.97%) and the rest of mothers who have jobs entrust their children to parents or in-laws to care for their children during their work.

There is no correlation between employment status P Value 0.631 (>0.50) and parenting status P Value 0.266 (>0.050) with completeness of basic immunization. Others study state that there is few associations were found between parental employment and up to date vaccination status. [3] Even mother has a plenty time with children, it doesn’t change the behavior of mother about giving immunization to their children. Children who are cared by their own mother have an almost equal opportunity to get complete basic immunization or not.

**Conclusion**

Education that has been taken by the mother became one of the primary factors on how mother’s thinking. The more complex something like immunization, they will try to get more information and knowledge about it before they make a decision. Health worker must provide the right information to them about benefit and risk of immunization so that it can increase the chance completeness of basic immunization.
In the other hand, mother’s knowledge should be improved through health promotion efforts with a more personal approach so that knowledge of mothers increases and also can improve the positive attitude of mothers against immunization.

**Ethical Approval:** Health Research Ethics Committee, Faculty of Public Health, Airlangga University, number 41-KEPK 7th February 2018

**Conflict of Interest:** there isn’t any conflict of interest

**Source of Funding:** self

**REFERENCES**


The Application of Lesson Study in Education of Stunting Prevention

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ABSTRACT

Background: The concept of Lesson Study (LS) has been used in the field of educational science. In the time being, Lesson Study is a concern in the health sector, due to health problems, especially stunting, which enable it to be prevented through education, especially education for mothers of toddler. This is an important factor to educate mothers of toddler with good use of lesson study. The purpose of this article is to summarize previous studies of the literature on Lesson Study, which is based on learning education for adults with applications that might be applied in educating these adults. It is hoped that the education provided through lesson study may help in improving the knowledge and attitudes of mothers of toddler in the purpose of stunting prevention efforts.

Method: The method used is by finding the keywords likes: education, andragogy, Lesson Study application techniques, health promotion, and media and adult learning methods.

Finding: 128 articles are reviewed and then the data extracted to: (1) reveal reasons for implementing Lesson Study, (2) identify the benefits of Lesson Study, (3) describe facilitators and obstacles to implementing Lesson Study.

Conclusion: Lesson Study includes: analyzing community needs about what they need to know, planning learning, community training/education sessions, communication technology, process mapping and reflection. So from that the health sector in the application of Lesson Study with the opportunity to analyze their needs for learning, designing the strategies used, implement and evaluate the Lesson Study system needs to be conducted. While further research needs to be done about the best way to do this lesson study so that it is applied to the health sector, especially in educating the public so as to provide a basis for preventing stunting.

Keyword: Lesson Study, Education, stunting.

Introduction

Health problems that have not been resolved until now one of them is stunting. The National Team for the Acceleration of Poverty Alleviation noted that there were several obstacles in the implementation of stunting prevention, including: the limited capacity and quality of program organizers, the limited number of health workers and the lack of competency in implementing programs1. In addition, there is still a lack of advocacy, campaign, and dissemination related to stunting and prevention efforts.

In general, people do not realize the importance of nutrition during pregnancy and the first two years of life. The Minister of Health, Antara (2017) explained that: “Women must increase their knowledge about nutrition, so that they can prevent cases of stunting in children or stunting. The nutrition education program that has been carried out in the form of counseling and counseling is felt to be ineffective. This happens because learning/counseling is done on a monologue basis. Monologue learning has not involved students directly in the learning process it self2.
Education for adults (toddlers' mothers) is very important. This is very possible, because adults are part of the community who will take strategic decisions in the family. Education carried out aims to change the mindset of society towards nutrition and health, so as to be able to change people’s attitudes in preventing stunting.

Education or learning in adults is a specific one. According to Makarao (2009) and Kartono (1992), adult learning is assumed that, the more mature students are, then: 1) self-directed behavior and mutual learning, 2) their learning orientation changes from mastery of material to problem solving abilities, 3) mastering ability in carrying out real life tasks, 4) requires self involvement in planning, implementing and evaluating learning (problem centered-orientation)²³.

The activity of planning the learning process, one of which can be done with lesson study. Lesson studies have developed in Japan since the early 1900s. In the 1970s the Japanese government benefited from konaikenshu and since then the Japanese government has encouraged schools to implement konaikenshu by providing cost support and incentives for schools that implement konaikenshu. The reason why lesson study in Japan is popular is because lesson study is very helpful for teachers. Although lesson study takes time, the teachers benefit greatly from valuable information to improve their teaching skills.

Lesson study not only helps students find their problems in learning, but also finds problems faced by the teacher in delivering material⁴. The advantages of applying study lessons in improving the quality of learning are: 1) Can be applied to all classes both schools and communities, 2) Encourage and assist in overcoming problems in learning, 3) encourage students to be more active in a pleasant learning atmosphere, 4) Participants students help each other in understanding the material, 5) encourage students to think and work as well as possible.

Lesson studies have long been developed in Japan and have been proven to improve the quality of learning. In addition, lesson study can improve communication and teacher competence⁵. Through the application of lesson study in adult learning, especially for mothers of children under five, it is assumed to have a positive effect not only for mothers of children under five, but also for instructors (health workers and cadres). The purpose of this study is to implement effective nutrition education for the community with the lesson study approach to stunting prevention, test the effectiveness of application of Lesson Study (ALS) in educating the public to prevent stunting and to find nutritional education programs to prevent stunting for the community.

Method

Literature Review: Lesson Study is identified by using electronic databases or browsing articles, journals, theses, dissertations and other research related to community health, andragogy, and health promotion. The searches were limited to English and Indonesian articles published from 1970 to 2019. In the literature search, the author read, summarized and summarized the contents of articles or journals independently, to identify themes to fit the theme written. Most articles are presented in the form of research, case studies, grounded theory or research methodology. Articles that have been collected, identified, and used to support the basic ideas of this study.

Result

Through 128 articles collected, after identification, 32 articles were obtained that did not meet the criteria, leaving 67 articles used in expressing, (1) reasons for implementing Lesson Study in the community, (2) identifying the benefits of Lesson Study, (3) describing the facilitator and obstacles to implementing Lesson Study.

Reasons for applying Lesson Study: Health efforts sourced from the community cannot be separated from public education. Low parental education has a greater risk of malnutrition status compared to highly educated parents⁶. The nutrition education program that has been carried out in the form of counseling and counseling is felt to be ineffective. This happened because learning/counseling carried out by health workers was carried out on a monologue basis. Monologue learning has not directly involved the community in the learning process itself. It is necesssurytano to find a solution in the process of nutrition education to the community. Behavioral problems that often arise in adult education programs, namely, get new things, arise incompatibility (feeling bored), grandiose theory (difficult to practice), new recipes/instructions (independent), not specific and difficult to accept changes ⁷.
Adults have a tendency to orient themselves toward solving life problems. Because learning for adults is a need to face problems in life. Before learning to the community begins, it must be planned in advance. Planning is an effort to involve the community in the learning process. The activity of planning the learning process, one of which can be done with lesson study. Lesson study not only helps students find their problems in learning, but also finds problems faced by the teacher in delivering material. The advantages of applying study lessons in improving the quality of learning are: 1) Can be applied to all classes both schools and communities, 2) Encourage and help in overcoming problems in learning, 3) encourage students to be more active in a pleasant learning atmosphere, 4) Participants students help each other in understanding the material, 5) encourage students to think and work as well as possible.

The community needs to be empowered in teaching the community itself. This is in accordance with the concept of lesson study, where learning is done by including from planning to evaluating the effectiveness of the learning provided. Lesson study carried out has a cycle that includes planning (plan), implementation (do) and reflection (see). The success of lesson study is not a person’s achievement in a moment, but is a result of the collaboration of many parties. This means that lesson study applied in the nutrition education process is a collaborative effort between health workers, cadres and the community, with the aim of improving the quality of nutrition education, which is carried out on an ongoing basis.

Lesson study applied in adult learning has a positive impact, because collaborative learning fosters enthusiasm for learning because there is involvement of participants in the learning process. Teachers can always conduct evaluations on each process that has been carried out. This can improve teacher competency. In addition, by implementing lesson study in learning provides a positive effect for teachers and students.

Lesson study can help improve the quality of learning. In this dissertation concept, the principles of lesson study are used to find the problems faced in providing nutritional learning to the community, help find solutions to those problems, plan how best to implement the solution and evaluate the implementation of learning that has been planned together between the community, staff health and cadres. Combining learning models and lesson study in nutritional learning in the community, is expected to be able to concretize effective learning/prevention of stunting.

Through the stages in lesson study, the community together finds what material they need so that they know about nutrition, parenting and healthy living habits. While health workers and cadres were helped to find out what material should be given, how the strategy for delivering the material, so that collaboration between the community, health workers and cadres was formed. A distinctive feature of learning in adults is learning together with colleagues, finding problems faced and solving problems together. Learning that is based on needs will foster interest in knowing about nutrition, parenting and healthy living habits. If community interest has grown, it is expected that there will be an increase in nutritional knowledge, changes in attitudes and healthy behavior in the community.

**Solution and Strategy: Implementation of Lesson Study in Formal Classes**

Lesson study is a process of learning implementation which consists of several stages in Mulyana, mentioning there are four stages in doing lesson learning, namely: 1) Analysis Phase (identification), 2) Planning Stage, 3) Implementation Phase, 4) Reflection Stage.

**Picture 1: The Lesson study Cycle**

1. **Analysis Phase (identification):** Planning begins with setting learning objectives, analyzing the needs and problems faced in providing education.
2. **Planning Phase:** Get around the lack of learning facilities, and collaboratively find solutions in solving problems faced by teachers in providing education in the classroom.
3. **Implementation Phase:** At this stage there are two activities, namely the implementation of
Learning activities carried out by one of the agreed instructors or at one’s own request to practice the learning plan that has been compiled together and observation activities carried out by other instructors acting as observers or observers.

4. Reflection Phase: This stage was carried out in the form of a discussion attended by all observers in the lesson study implementation activities guided by a facilitator. The discussion starts from conveying the impressions felt during practicing learning. Furthermore, all observers submit comments or suggestions wisely on the learning process that has been carried out supported by evidence obtained from observations, not based on their own opinions. This is done as an effort to improve the learning process going forward.

Application of Lesson Study in Non Formal Classes: In this informal class, it is conducted on very heterogeneous communities. Learning or education is based on the theory of learning in adults (Andragogy). According to Lunandi (1987) and Knowles (1970), the teacher’s own abilities must also be improved, because teaching adults requires strategies and methods tailored to the abilities of adults\textsuperscript{15,16}. Besides the limitations possessed by adults such as the ability to understand a material, feeling bored faster, the limited time available, should be the attention of the teacher in choosing the methods, strategies and media used\textsuperscript{17}.

The application of lesson study to stunting prevention education is oriented towards improving the quality of non-formal learning. Modified the application of lesson study to this educational process. Modifications include the place of study, time of study/duration, participants and instructors as well as the learning environment. The process carried out at each stage of lesson study also undergoes modification, but it is still implemented using the lesson study cycle. If in the implementation of lesson study in class, the more instrumental is the teaching community, namely the teacher lecturer, but in the Lesson Study Application (ALS) the teacher and participants collaborate to achieve the learning objectives that have been set together. In ALS, students are mothers who have stunting toddlers and mothers who have children under five with normal nutritional status. This is intended to fulfill the characteristics of adult learning, which tends to study with peers. In ALS teaching is not a teacher or lecturer, but health workers (health workers) are in charge of providing counseling to the community and posyandu cadres. This is done because health workers and cadres in the health education and promotion program carried out by the government are nutrition counseling staff and have close relations with the community, especially mothers of children under five.

Study of Limitations: The main limitation of this review is that most of the research in English has been included in databases of the social sciences and humanities. There is also another disadvantage is the consistency of research design included in the review using different methodologies.

Conclusion

There are several obstacles in the implementation of the acceleration of stunting prevention, including: Limited capacity and quality of program organizers, limited number of health workers who provide counseling to the community. Besides the limited number of health workers, the government is also faced with the problem of lack of competency of officers in carrying out the program (WHO, 2018)\textsuperscript{1}. 5) Still lack of advocacy, campaigning and dissemination related to stunting, and various prevention efforts. The limitation of organizing nutrition intervention programs, has not shown a significant impact in preventing stunting and improving child nutrition. Several studies have been conducted in countries with high prevalence of stunting, such as Peru, Vietnam, Indonesia and Bangladesh, recommending that the importance of a national campaign to encourage public awareness about stunting.

Prevention of stunting itself must get the right response, concrete evidence found the importance of implementing lesson study to educate the public. The advantages of implementing lesson study in improving the quality of learning are: 1) Can be applied to all classes both schools and communities, 2) Encourage and assist in overcoming problems in learning, 3) encourage students to be more active in a pleasant learning atmosphere, 4) Participants students help each other in understanding the material, 5) encourage students to think and work as well as possible.

Lesson study applied in the nutrition education process is a collaborative effort between health workers, cadres and the community, with the aim of improving the quality of nutrition education, which is carried out on
an ongoing basis. In addition, lesson study is a transition and if possible further research must apply this education to make changes in public education.

**Author Contributions:** K leads at the beginning of article search, identification, writing and review analysis. NI leads in the identification of additional articles, analysis, weighting of articles and writing. I give ideas for research, and help compile research designs, revisions and finalizations. M assists in the supervision and revision of research, especially regarding research methodology. H helps in revisions, identification of additional articles, evaluation of articles and rearranged until the end of article writing.

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**Ethical Clearance:** Health Research Ethics Committee, Faculty of Medicine Andalas University of Padang

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Implication of Uncertainty and Sensitivity Analysis of Ebola Virus Disease Transmission

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ABSTRACT

Ebola epidemic model threshold value indicates whether the disease will continue to spread in a population or not. However, the accurate value of this threshold is influenced by uncertainty in its parameters’ values which are marred by parameter estimation errors due to procedure, errors in data collection and underlying model assumptions. Understanding the implication of changes in parameters values is necessary in order to guide outbreak control decision. Next generation matrix approach was used to determine the basic reproduction number of SVEQHIFR Ebola epidemic model. In assessing the influence, direction, and strength of relationship parameters to Ebola basic reproduction number, 1000 simulations run for LHS/PRCC procedure was used. Positive or negative sensitivity indices of the threshold value to parameter changes indicate that control measure should be intensified in reversing or enhancing these indices. This information can gauge implementation of interventions strategies in the attempt to decelerate Ebola disease transmission.

Keywords: Ebola, uncertainty analysis, sensitivity analysis, basic reproduction number

Introduction

Ebola outbreak infected over 28,000 and killing nearly half the number infected in West African region. It spread to more than 5 countries (Guinea, Liberia, Sierra Leone, Nigeria Mali and Senegal) in the region, adversely affecting Guinea, Sierra-Leone, and Liberia¹. Epidemic models’ parameters are more-or-less uncertain and outcomes of model fits are themselves uncertain as due to several factors. An important static parameter value that shows if a disease outbreak will stop or not, is the basic reproduction number. It is defined as average number of secondary infections caused by a single infectious individual during its entire infectious lifetime in a fully susceptible. As different diseases have different values, so do different methods are used to determine this parameter². Though there are alternatives to this parameter³-⁵, the basic reproduction number has been widely used to analyze its sensitivity to changes in its parameter changes to interpret growth of epidemic in order to gauge prevention and control. Ebola is known to have threshold value ranging from 1.2 to 2.8 in the affected countries⁶-¹⁰. Performing uncertainty and sensitivity analysis upon this model threshold is important for determining influential parameters of Ebola virus disease transmission. Sensitivity indexes will help identify whether a small change in any of the model parameters will lead to a greater or lesser effect in the increase or decrease in Ebola transmission or prevalence.

This study is divided into four sections, section one provided the review and background of the problem. Section two considered the Ebola transmission model used to determine the threshold parameter, the basic reproduction number. The third section performed local and global uncertainty and sensitivity analysis of Ebola basic reproduction number to its parameters, finally the conclusion.

Ebola Transmission Model: The model considered for this investigation is a nine compartmental deterministic epidemic model, intended to model Ebola disease,
following which has caused at least 14 confirmed outbreaks in Africa between 1976 and 2006. Using data from two epidemics in Democratic Republic of Congo (DRC) we developed SVEQIHFR for Ebola epidemic, in which the population is divided into susceptible, susceptible-quarantined, vaccine, asymptomatic exposed and quarantined, nonisolated and isolated symptomatic infectious, safely removed dead and recovered individuals. The model is depicted in Figure 1.

The ordinary differential equations of the Ebola growth model is

\[
\begin{align*}
\frac{dS}{dt} &= -(1-\gamma)\lambda S - \gamma L S - \lambda S - \xi S \\
\frac{dV}{dt} &= \lambda S - (1-\eta)\lambda V \\
\frac{dE}{dt} &= (1-\gamma)\lambda S + (1-\eta)\lambda V - (\chi + \alpha_1)E \\
\frac{dQ}{dt} &= \gamma_1L + \chi E - \alpha_2 Q \\
\frac{dI}{dt} &= \alpha_1 E - (\theta_1 + (1-\theta_1)\delta_1 + (1 - \delta_1)\gamma_1) I \\
\frac{dH}{dt} &= \alpha_2 Q + \theta_1 - (\delta_2 + (1 - \delta_2)\gamma_2) H \\
\frac{dF}{dt} &= -(1-\theta)\delta_1 I + \delta_1 I, F \\
\frac{dR}{dt} &= (1-\theta)(1-\delta_1)\gamma_1 I + (1-\delta_1)\gamma_2 H + \gamma_2 F \\
\end{align*}
\]

The process of disease transmission and transition among compartments starts with a susceptible individual becoming infected through contact with infectious individuals. Susceptible individual enters into the latent class at a rate \(\lambda S\). Among the infected individuals (\(S\)) a fraction \(\gamma\) will be quarantined (Q) at the early stage of infection. A fraction of exposed individuals (1 - \(\gamma\)) who are not quarantined at the beginning of infection will be quarantined at a constant rate \(\chi\) throughout the latent period. Susceptible individuals are vaccinated at a rate \(\xi\). Effectiveness of immunization is assumed to be \(\eta\) where 0 \(\leq\) \(\eta\) \(\leq\) 1 that is vaccine effectiveness ranges from imperfect to perfectly effective vaccination. Proportion of susceptible individuals upon whom vaccine is not effective is exposed to infection at a rate \(\lambda(1 - \eta)\). Non-quarantined and quarantined individual progresses to infectious stage at constant rates \(\alpha_1\) and \(\alpha_2\) respectively. Proportion of infectious individuals \(\theta\) will be isolated at a rate \(\gamma_1\), non-isolated infectious individuals die and are removed through safe burial at a rate \(\delta_1(1 - \theta)\gamma_1\). The non-isolated infectious survivors are removed at a rate \((1 - \theta)(1 - \delta_1)\gamma_1\). Hospitalized individual die and are safely buried at a rate \(\delta_2(1 - \delta_2)\gamma_2\) but they recover at a rate \((1 - \delta_2)\gamma_2\). Cadavers from community and isolated centers are safely buried or removed at a rate \(\gamma_2\).

With the force of infection defined as, 
\[
\lambda = \frac{\beta_1 I + (1 - \rho)\beta_2 H + (1 - \Psi)\beta_3 F}{N} 
\]

Where \(\beta\) (relative to infectious individuals in community, hospital and funeral) the transmission coefficient, \(\rho \in [0, 1]\) is the fraction of reduction in the transmission rate of isolated with \(\rho = 1\), \(\rho = 0\) and \(0 < \rho < 1\) denotes a completely effective, completely ineffective and partially effective isolation. Fraction of reduction in transmission during safe burial is \(\Psi \in [0, 1]\) with \(\Psi = 1\), \(\Psi = 0\) and \(0 < \Psi < 1\) denoting completely effective, completely ineffective and partially effective safe burial respectively.

\textbf{Ebola Reproduction number (R\(_9\))}: Basic reproduction number (usually denoted as \(R_0\)) is the average number of secondary infections caused by a single Ebola infectious individual during the entire infectious lifetime. Epidemiologists make use of \(R_0\) to gauge control requirement. Since the model SVEQIHFR consists of multiple infective classes, we used the next generation matrix approach, developed by specifically for the most frequently used so-called compartmental models. We present a detailed easy recipe for the construction of the NGM from basic ingredients derived directly from the specifications of the model. We show that two related matrices exist which we define to be the NGM with large domain and the NGM with small domain. The three matrices together reflect the range of possibilities encountered in the literature for the characterization of \(0\), to determine the reproduction number of the Ebola epidemic model. The reproduction number is the dominant eigenvalue (spectral radius) of \((FV^{-1})\) as \(R_0 = \rho(FV^{-1})\). Hence

\[FV^{-1}\]
R₀ = \frac{β₁α₁}{(χ + α₁)(γ₁ + γ + (1 - θ)(1 - δ₁) + γ₂ + (1 - θ)δ₁)}
+ \frac{β₂}{γ₁ + γ₂ + γ₃(1 - δ₂)} + \frac{β₁(1 - ρ)}{(χ + α₁)(γ₁ + γ₂ + γ₃(1 - θ)(1 - δ₂) + γ₄ + (1 - θ)δ₂)}
+ \frac{β₃}{γ₃ + (χ + α₁)(γ₁ + γ₂ + γ₃(1 - θ)(1 - δ₁) + γ₄ + (1 - θ)δ₁)}
+ \frac{β₄(1 - r)}{γ₄ + (χ + α₁)(γ₁ + γ₂ + γ₃(1 - θ)(1 - δ₁) + γ₄ + (1 - θ)δ₁)}
+ \frac{β₅}{γ₅ + (χ + α₁)(γ₁ + γ₂ + γ₃(1 - θ)(1 - δ₁) + γ₄ + (1 - θ)δ₁)}

\text{Sensitivity index of Ebola Transmission Threshold (R₀):} \text{ Performing a sensitivity index will help identify parameters of significant influence on the disease transmission and prevalence. Therefore the normalized sensitivity index of each parameter is evaluated using}

\frac{∂R₀}{∂y_j} = \frac{y_j}{R₀} \frac{∂R₀}{∂y_j}

\text{Using the parameter in values indicated in related study, we determine the sensitivity index of } R₀ \text{ with respect to the model parameters of each country and is provided in Table 2}

\text{Table 2: Sensitivity index (Γ⁻¹) for Guinea, Liberia, and Sierra Leone Ebola outbreaks}

<table>
<thead>
<tr>
<th>Parameters (y_j)</th>
<th>Guinea</th>
<th>Liberia</th>
<th>Sierra Leone</th>
</tr>
</thead>
<tbody>
<tr>
<td>β₁</td>
<td>0.5280</td>
<td>0.8732</td>
<td>0.8475</td>
</tr>
<tr>
<td>β₂</td>
<td>0.3724</td>
<td>0.0913</td>
<td>0.1064</td>
</tr>
<tr>
<td>β₃</td>
<td>0.0996</td>
<td>0.0355</td>
<td>0.0462</td>
</tr>
<tr>
<td>ρ</td>
<td>-0.2774</td>
<td>-0.1186</td>
<td>-0.0771</td>
</tr>
<tr>
<td>Ψ</td>
<td>-0.4537</td>
<td>-0.1066</td>
<td>-0.1400</td>
</tr>
<tr>
<td>Χ</td>
<td>-0.0696</td>
<td>-0.1183</td>
<td>-0.1149</td>
</tr>
<tr>
<td>α₁</td>
<td>0.1861</td>
<td>0.1498</td>
<td>0.1536</td>
</tr>
<tr>
<td>δ₁</td>
<td>0.0401</td>
<td>-0.8996</td>
<td>0.0996</td>
</tr>
<tr>
<td>δ₂</td>
<td>0.1322</td>
<td>0.0371</td>
<td>-0.0320</td>
</tr>
<tr>
<td>θ</td>
<td>0.1872</td>
<td>-0.4547</td>
<td>-0.4906</td>
</tr>
<tr>
<td>γ₁</td>
<td>-0.0315</td>
<td>-0.1547</td>
<td>-0.0445</td>
</tr>
<tr>
<td>γ₂</td>
<td>-0.2163</td>
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<td>-0.0409</td>
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<td>γ₄</td>
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<td>-0.7295</td>
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<td>γ₅</td>
<td>-0.3162</td>
<td>-0.0513</td>
<td>-2.7538</td>
</tr>
<tr>
<td>γ₆</td>
<td>-0.1502</td>
<td>-0.0124</td>
<td>-0.0624</td>
</tr>
</tbody>
</table>

\text{Sensitivity Index of Ebola transmission in Guinea:} \text{ The most sensitive parameters of Ebola transmission rate in the Liberian outbreak are the transmission coefficients in the community } β₁, \text{ fatality rate of Ebola in the community } δ₁, \text{ proportion of hospitalized individuals } θ \text{ and hospitalization rate } γ_{IH}, \text{ followed by the average incubation of individuals in the community } α₁, \text{ transmission coefficient in the hospital } β_{IH}, \text{ fatality rate in hospital } δ₂, \text{ transmission coefficient during burial } β₇, \text{ efficiency of isolation } ρ \text{, quarantining of exposed } χ \text{ asymptomatic individuals, rate infectious non isolated or isolated individuals survive } γ₇, \text{ rate non-isolated individuals die and are given safe burial } γ_{IH}, \text{ rate of safe burial } γ₈ \text{ and finally rate isolated individuals die and that are given safe burial } γ_{IH}.

A desired percentage reduction in the Ebola transmission rate in the Liberia population will demand
intervention strategies that reduce the transmission coefficients. Since $\beta_1$, $\delta_1$, $\gamma_{HF}$, $\theta$ have high sensitivity index, a percentage change in control strategies that minimizes or maximize these parameters will equivalently influence Ebola transmission rate in Liberia. Intensive efforts to enhance the hospitalization rate coupled with effective isolation and reduction in fatality rate in the community through effective contact tracing and identification of exposed asymptomatic individuals will largely decelerate Ebola transmission in Liberia. A 10% reduction in transmission coefficient in the community and an increase in hospitalization will result in an 8.72% and 4.55% reduction in transmission rate.

**Sensitivity index of Ebola transmission in Sierra Leone:** Parameters that have high sensitivity index in the transmission of Ebola in Sierra Leone are transmission coefficient in the community $\beta_1$, rate of non-isolated individuals die in the community that are safely buried, $\gamma_{IF}$ hospitalization rate of symptomatic individuals $\gamma_{II}$ and proportion of individuals that are isolated $\theta$, these are followed by $\alpha_1$, $\beta_{HF}$, $\delta_1$, $\beta_r$, $\psi$, $\chi$, $\rho$, $\gamma_r$, $\gamma_I$, $\gamma_{HF}$, $\gamma_b$, $\gamma_f$. With high isolation and safe burial efficacy, the transmission rates in hospital and during burial will be reduced, hence a decrease in the transmission of the virus in Sierra Leone population. Equivalent percentage change in $R_0$ due to changes in parameters, will empirically explain the Ebola transmission minimization objective. A 10% change in reduction in the Ebola virus transmission in the community $\beta_1$, increase in hospitalized individuals $\theta$, reduction in death rate of non-isolated individuals from the community $\gamma_{IF}$ and increased rate of hospitalization $\gamma_{II}$ will result into 8.4%, 4.9%, 7.2% and 27.0% a decline in disease transmission in Sierra Leone population.

**Uncertainty analysis of Ebola Transmission:** There are different methods for carrying out a uncertainty analysis on static or functional epidemic quantities. In this study, we carried out uncertainty analysis of the reproduction number using sample-based Latin Hypercube Sampling/Partial Rank Correlation Coefficient. Using PRCC we can rank the effect that each parameter has on $R_0$ while other parameters simultaneously vary within their ranges. With sample runs of 1000 simulations, transmission rate of Ebola in each country was determined to be 2.076 with confidence interval [1.9764, 2.1749] for Guinea, 2.0242 with CI of [1.9316, 2.1168] for Liberia, and 2.0282 with CI of [1.9351, 2.1213] for Sierra Leone. This is within range, as determined by other studies. Uncertainty analysis showed that transmission coefficients in the community $\beta_1$ and hospitals $\beta_2$, and effective safe burial rate $\psi$ have higher correlation to the disease transmission, as is established. This is followed by transmission coefficient at funeral $\beta_f$ and effective contact tracing and quarantining of exposed individuals $\chi$, while death rates in hospital $\delta_1$ and proportion of hospitalized individuals $\theta$ also have moderately lower correlations along with average periods of recovery from community $\gamma_f$ and hospital $\gamma_{HF}$ or removal of deaths from isolation centers $\gamma_{HF}$ and non isolated victim $\gamma_{IF}$. Average period from onset to hospitalization $\gamma_{II}$ and average period of safe burial of victims $\gamma_{IF}$, this findings concurs with . Qualitative information showing the correlation coefficients of parameters changes to Ebola transmissions are provided in Figures 1, 2 and 3 for respective countries’ outbreaks. Preventive measures like limiting contact rate, restriction of movement, closure of public places and borders across countries and communities, enhanced public and personal hygiene will reverse the positive influence of these parameters to Ebola transmission. On the other hand safe burial rate having negative correlation coefficient thus requires quick and safe burial practices involving trained teams, sterilization of fomites from victims, and cordon sanitaire of premises in improved upon. To control the high chances of Ebola virus transmission in the hospital, intensive support and barrier nursing practices will curb the increase in transmission.

![Figure 1: PRCC showing the influence of parameter changes on the transmission rate ($R_0$) of Ebola in Guinea](image-url)
Figure 2: PRCC showing the influence of parameter changes on the transmission rate ($R_0$) of Ebola in Liberia

Figure 3: PRCC showing the influence of parameter changes on the transmission rate ($R_0$) of Ebola in Sierra Leone

Conclusion

Assessing the epidemic threshold’s change to parameter can help gauges deployment of preventive and control measures to stall the rising transmission rate of Ebola in the populations. Based on these findings it is recommendable that concerted efforts in controlling the epidemic should involve reducing contact rate among the susceptible population by identifying and tracking exposed (both symptomatic and asymptomatic) individuals that will be promptly moved to safe isolation centers. Victims’ relatives and medical personnel should make use of personal protective equipment and barrier nursing to limit contact with victim’s body fluid. Prompt and effective safe burial protocols should be adhered to so that dead victims from the community should be handed over to the trained teams for effective safe burial. For high impact of preventive and control interventions upon Ebola transmission in these countries, contact tracing and safe burials, restricted movement across borders and the provision of diagnostic and support facilities in isolation centers should be enhanced.

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Conflict of Interest: The authors have no conflict of interest

Ethical Statement: The study only made use of data from public domain (WHO and CDC), to simulate Ebola epidemic growth model in the populations of affected countries. It did not involve any experiment on human or animal.

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The Influence of Topical Propolis Administration Against the Number of Macrophag Cell Migration in Mice Wounds

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ABSTRACT

Background: Wounds are lost or damaged body tissue integrity due to trauma experienced such as sharp objects trauma. The initial occurrence of the wound will trigger the body’s response to inflammation which is a complex biological response and the body’s immune system to dangerous stimuli. Clinically the inflammatory phase is characterized by symptoms around the tissue such as increased heat, redness (rubor), pain (dolor), swelling (tumor), and loss of function. Excessive trade processes can be suppressed by giving anti-inflammatory ingredients such as propolis. Propolis is a natural material from bees that has anti-inflammatory properties that can be an alternative ingredient in suppressing inflammation that occurs to reduce the clinical symptoms that appear.

Objective: To know the potential for topical administration of propolis to the migration of macrophages to wounds in mice.

Method: This study was a pure laboratory experiment with a post-test only control group design. The subjects of this study were 24 mice divided into 12 treatment groups which were given topical propolis and a control group of 12 who were not given propolis. An incision with a wound of 2 mm and a length of 15 mm was carried out on the back of the mice then the wound was smeared with 80% propolis extract twice a day for the treatment group. Three mice were sacrificed for each observation day, namely days 1, 3, 5, 7 and then made tissue preparations, then macrophages were observed using a microscope.

Results: There were significant differences between the treatment and control groups using the Mann Whitney test statistical analysis.

Conclusion: There is the influence of topical propolis administration in mice wounds against macrophage cell migration as an anti-inflammatory effect of propolis.

Keywords: propolis, wounds, inflammation and, macrophages

Introduction

Wounds are lost or damaged body tissue integrity due to trauma experienced such as trauma by sharp objects or blunt, changes in temperature, chemicals, explosions, electric shock or animal bites that can cause a total injury which will then trigger a reaction from the body to hold healing process.¹ The wound healing process will involve a complicated relationship between cellular, humoral factors and connective tissue elements. Host responses to wound healing are generally divided into several phases, each of which overlap, namely the inflammatory phase, proliferation, and maturation.²,³ The first phase of the inflammatory phase is a complex biological response of vascular tissue and immune cells to dangerous stimuli, characterized by phagocyte migration, accumulation of neutrophils, monocytes, macrophages and loss of tissue function. During the inflammatory process, some release of pro-inflammatory cytokines are activated by macrophages, causing more severe symptoms of inflammation.⁴
Macrophage is one of the most leukocyte cells that play a role in the inflammatory phase. Generally macrophages appear first 48-96 hours after injury and reach a peak on the third day until the healing process runs perfectly. Macrophages play an active role as phagocytes that are capable of affixing and digesting agents, macrophages also play a role in producing various types of mediators that regulate various biological activities such as arachidonic acid metabolism which will produce pathways of cyclooxygenase and lipoxygenase pathways which trigger the appearance of inflammatory symptoms. The best results from inflammatory reactions can be achieved if there is little or no tissue damage below. Therefore the excessive inflammatory process must be suppressed by giving anti-inflammatory drugs.

Propolis is a resin material that is attached to flowers, shoots and bark. It is concentrated, gummy, blackish brown, with a distinctive odor, and bitter taste. Propolis is obtained from various types of plants, especially from buds and leaves which are often used as traditional medicines that have various beneficial effects such as anti-bacterial, anti-fungal, anti-inflammatory, anti-viral, immunostimulator, and anti-cancer.

Propolis has anti-inflammatory activities that can increase the body’s immune system because it contains CAPE (Caffeic Acid Phenethyl Ester) in it. CAPE is a chemical compound in propolis which can inhibit inflammation (anti-inflammatory), because CAPE is able to enter the cell and it can inhibit lipoxigenase or LOX and cyclooxygenase or COX enzymes involved in the arachidonic acid metabolic pathway and also inhibit the release of proinflammatory cytokines and increase the production of anti-inflammatory cytokines. In addition CAPE can also reduce inflammatory cell neutrophils and monocytes infiltration.

Method

This type of research is an experimental (true experiment) laboratory with a post test only with control group design research.

Propolis used is propolis from Trigona Spp bee, which is widely found in South Sulawesi’s North Luwu Regency. What is applied to the wound is mice twice a day.

The mice used was Mus Musculus with ages 2-3 months and weighing 20-30 gr. The next one will be wound with a length of 15 mm and a depth of 2 mm (full thickness).

The results of the calculation of the number of macrophage cells per field of view in the control group showed the average number of macrophage cells on the first day after the wound was 56.66 and then increased on the third day 106 cells, then observations on the fifth day showed a decrease in the number of cells, 51 cells and continued to decline until the seventh day, which were 38 cells.

The results of the calculation of the number of macrophage cells per field of view in the treatment group or by giving propolis showed the average number of macrophage cells on the first day after the wound was 35 cells and then increased on the third day 50.3333 cells, then observations on the fifth day showed a decrease in the number of cells, 32 cells and continued to decline until the seventh day, which were 29 cells.
From the results of observations in both groups, namely the control and treatment groups, it can be concluded that the average number of macrophage cells is higher in the control group compared to the treatment group or those given propolis.

From the above data it can be visualized the number of polymorphonuclear in the graph below:

![Figure 1: Graph of average polymorphonuclear quantities](image)

Based on the graph above it can be seen that macrophages began to appear on the first day then increased on the third day and then decreased on the fifth day and seventh day and the average number of macrophages in the group given propolis extract was lower compared to groups not given propolis.

Statistical analysis with the Whitney mann test showed a significant difference between the control group and the treatment group.

The description of the results of observations of macrophage cells as follows:

1. First Day (Control)

![Figure 2: First day of control](image)

2. First day (Treatment)

![Figure 3: First day of treatment](image)

3. Seventh day (treatment)

![Figure 4: Seventh day of treatment](image)

**Discussion**

Based on observations and calculations of the number of cells per field of view it was found that the number of macrophages in the treatment group given propolis was lower than the group not given propolis. The highest number of macrophages was on the third day in the control and treatment groups and there was a significant difference between the two groups on the third day, according to the literature which said that the peak migration of macrophages would occur on day 3 to day 5 after injured.

Inflammatory process is a complex biological response from vascular tissue and the body’s immune system against harmful substances such as irritation, damaged cells, pathogens. The presence of wound stimulation will trigger cellular activity such as phagocyte migration, accumulation of neutrophils, monocytes and macrophages. During trade macrophages will activate some release of pro-inflammatory cytokines so that it will cause more severe symptoms of inflammation.

Clinically inflammation will cause symptoms of inflammation such as heat, redness, swelling, pain.
and even cause loss of function.\textsuperscript{11} Symptoms of severe inflammation must be suppressed by giving anti-inflammatory drugs.\textsuperscript{6}

Propolis is a natural ingredient derived from bees, has various health benefits, one of which is to provide an anti-inflammatory effect, this has been proven based on the results of research that show that the average number of macrophages in groups with topical propolis is lower than those who do not given propolis and in the treatment group (given propolis) on the third day it has shown that there is a process of reepithelialization on the surface of the wound until the 7th day epithelialization of the wound surface begins to form well and begins the formation of connective tissue which indicates the wound healing process is going well.

The ingredients contained in propolis will inhibit the metabolism of arachidonic acid thus it suppresses the cyclooxygenase (COX) and lypoxygenase (LOX) enzymes during the inflammatory process. COX is inhibited by flavonoids which suppress prostaglandins while LOX is inhibited by a component of quercetin propolis. flavonoids also inhibit the accumulation of mast cells. Caffeic phenetyl ester (CAPE) in propolis into the cell inhibits the release of proinflammatory cytokines and increases anti-inflammatory cytokines such as IL-4 and IL-10.\textsuperscript{10,15}

IL-10 will suppress TNF-α and IL-1.\textsuperscript{13,14} Reduction in TNF-α and IL-1 influences eukocyte rolling and adhesion, especially elephant macrophages from blood vessels, this causes a decrease in the number of macrophage cell migration in the wound, in this case if the macrophage migration to the inflammatory area decreases it will reduce inflammation symptoms that arises because macrophages also have a role in activating the release of pro-inflammatory cytokines which will cause more amount of tissue to be destroyed thus the clinical symptoms of inflammation will be more severe. However, with a decrease in macrophage migration to the injured area, it will reduce the trading signals that occur.\textsuperscript{16,17}

\textbf{Conclusion}

The conclusion of this study is that there are significant differences between the control and treatment groups. macrophages begin to migrate on the first day after a wound and reaches its peak on the third day then decreases again on the fifth day to the seventh day. Propolis extract given topically to the wound in mice can reduce the number of macrophage cell migration to the inflammatory area.

\textbf{Conflict of Interest:} There is no conflict of interest in this study.

\textbf{Source of Funding:} Domestic government

\textbf{Ethical Clearance:} This study obtained a label of ethics escaped by the number: 0035/PL09/KEPKFKG - RSGMUNHAS/2018 and register number UH 17120029 on Oktober 8, 2018.

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Update on Ethanol Induced Oxidative Stress in Liver Toxicity and the Effects of Pregnancy

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ABSTRACT

Background: Ethanol induced hepatotoxicity is one of the major problems worldwide and especially in developing countries. Alcohol is the most abused substance and affects the normal defense mechanisms. Methodology: Chronic consumption of alcohol can cause behavioral changes, oxidative stress and elevation of liver enzymes due to imbalance between the antioxidant and pro-oxidant systems. Continuous oxidative stress results in accumulation of fat in the liver, which can lead to fibrosis, cirrhosis and liver cancer. Pathogenesis of alcoholic liver disease has several mechanisms and progression not fully understood. Results: Prognosis of alcohol induced liver disease depends on the period of alcohol consumption, percentage and volume of alcohol, inflammatory effects, dietary habits and genetic linkage among others. Conclusion: This review mainly focuses on updates on alcohol induced oxidative stress, liver toxicity and the effects of pregnancy.

Keywords: Alcohol, oxidative stress, liver toxicity, pregnancy

Introduction

Alcohol consumption is a significant contributor to the burden of metabolic diseases and is a major public health concern. Generally, most of the population surveys showed that alcoholics have a high prevalence of anxiety disorders, schizophrenia, affective disorders and other psychological effects. The condition of alcoholic liver disease ranges from steatosis to fibrosis and ultimately the patients develop cirrhosis. Previous studies reported that around 80% of heavy drinkers have chances to develop steatosis, 35% develop hepatitis and another 10% get cirrhosis. Experimental studies showed that chronic intake of alcohol induces severe oxidative stress and damage normal functions of the liver and develop the condition of apoptosis. Recent research studies showed that alcohol sensitizes the hepatocytes and leads to lipopolysaccharide mediated cytotoxicity. Intake of alcohol during pregnancy results in fetal alcohol spectrum disorders which includes fetal alcohol effects and fetal alcohol syndrome.

Development of oxidative stress and liver disease: Long term consumption of ethanol results in sensitization of inflammatory mediator’s response such as ROS, nitrogen species and cytokines that characterized the development of hepatic steatosis. Figure 1 demonstrated that oxidative stress is a common denominator in pathogenesis of liver disease. Injury of adipose and liver tissue cause an expression of inflammatory mediators and increase the infiltration of macrophages. The condition of steatosis, hepatic fibrosis and cirrhosis developed by chronic ingestion and continues to represent a major health issues. Chronic intake of alcohol increases the response of kupffer cells and activation of inflammatory mediators and ROS. It is also associated with vascular diseases and other risk factors. Regular use of ethanol is associated with inadequate control of blood pressure in treating hypertensive patients.

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Chronic ethanol intake → increase toxic metabolites in the liver (CYP 2PE1) ↓ (Iron overload) → Proliferative cytokines (IL-1β, TNF-α) ↓ Induction and increase of GGT ↓ Production of ROS/RNS ↓ Increase MDA and consumption of GSH ↓ Decrease GSH and sustained oxidative stress ↓ Membrane damage, enzyme leakage ↓ Alcohol liver disease

**Figure 1: Schematic representation of oxidative stress and liver disease**

Several clinical studies show that chronic intake of alcohol has a higher risk of brain ischemia, stroke and increased blood pressure. The modulation of kupffer cell activation and liver enzymes elevation appears in chronic alcoholic individuals. Moreover, the kupffer cell activation is a major contributory factor of liver carcinogenesis. There is hyper-excitability of the central nervous system. Many of the alcohol dependent individuals try to quit but few of them succeed. The development of apoptosis can induced via extrinsic or intrinsic pathway such as death receptor and mitochondria.

In experimental animals including rats and mice, the decrease in the concentration of serum adiponectin after chronic exposure of ethanol has been demonstrated. Long term use of ethanol impairs the normal regulation of insulin and changes of hormonal regulations.

**Inflammatory mediators and response on liver:** It is well documented that chronic ethanol consumption inhibits mitochondrial electron transport, increases ROS production and impaired synthesis if adenosine triphosphate. Numerous studies reflected that reactive oxygen species to develop lipid peroxidation of liver cell membranes and this leads to tissue damage. Chronic ethanol consumption causes a number of health issues, including incoordination of motor function, blurring vision, sedation and hypnosis. Continued use of ethanol results in the elevation of endotoxin levels and the stimulation of Kupffer cells to generate free radicals via NADPH oxidase. Further there is activation of NF-kB and damage of tissues.

**Alcohol consumption and alters the metabolism:** Alcohol induced hepatic damage leads to elevation of liver enzymes such as aspartate amino transferase and alanine amino transferase and this ratio is greater than 1. This is the specific marker of liver toxicity. Regular use of ethanol is associated with inadequate control of blood pressure in treated hypertensive patients. Long term intake of ethanol is associated with uncontrolled blood pressure in cardiovascular disease patients and accumulation of proteins in the liver due to decreased rate of protein catabolism.

Long term use of ethanol reveals damage of mitochondrial structure and elevation of ROS and cytotoxicity. Additionally, ethanol-fed rats show increased hydroxyl radical production and protein carbonyl groups when compared with cytosolic proteins. Table 1 showed that several metabolic pathways have been playing a vital role in liver pathogenesis. Chronic intake of ethanol increases the production of hydrogen peroxide and superoxide by CYP450.

**Table 1: Pathways of ethanol metabolism**

<table>
<thead>
<tr>
<th>Sources</th>
<th>Metabolites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol metabolism</td>
<td>Acetaldehyde</td>
</tr>
<tr>
<td>Lipid peroxidation of long-chain polyunsaturated fatty acids</td>
<td>4-hydroxynonenal (HNE)</td>
</tr>
<tr>
<td>Nonenzymatic lipid peroxidation of unsaturated fatty acids, breakdown of arachidonic acid in platelets</td>
<td>Malondialdehyde (MDA)</td>
</tr>
<tr>
<td>Ethanol oxidation in the presence of iron</td>
<td>Hydroxyethyl radical (HER)</td>
</tr>
</tbody>
</table>

When increasing of hydroxyl radical factors to develop the damage of normal metabolic functions. In ethanol metabolism, increase oxidative stress, such as malondialdehyde, acetaldehyde and 4-hydroxy-2-nonenal (HNE). Lipid Peroxidation of 4-Hydroxy-2-Nonenal (4-HNE) induces the insulin resistance in skeletal muscle through carbonyl and oxidative stress.

In addition, oxygen demand and nitrosative stress play a key role of initiating fatty liver and cirrhosis. There are some specific factors involved in liver pathogenesis such as generation of NADH, triglyceride synthesis, inhibition of mitochondrial β-oxidation of fatty acids and activation of NF-kB.
The following metabolic disorder found in alcoholics such as,

- Fatty liver and excessive level of lipids in the blood
- Accumulation of lactic acid in the body fluids
- Excessive production of ketones in the body
- Elevated levels of uric acid in the blood

A number of behavioral effects influenced by ethanol and it’s referred at the action of GABAA receptors. Some toxicological compounds more affinity to the subtype of CYP2E1 enzyme such as acetaminophen, ethanol, benzene, carbon tetrachloride and other halogenated substrates. Injury of liver, that leads to oxygen demand in centrilobular and sensitivity increased in inflammatory mediators. Several studies evidenced that chronic ethanol intake abnormalities of cardiovascular functions and effects on alpha α1-induced contraction.

**Effect of alcohol in pregnancy:** Alcohol usage in women varies from country to country depending on cultural and social variations. Even those women who drink will modify their behaviour once it is known that they are pregnant. In a national survey of more than 300000 records, it was found that 87% of women who drank alcohol before pregnancy stopped drinking during pregnancy, 6.6% reduced their intake and another 6.4% carried on at previous levels. Women have to be informed that there is NO safe level of drinking in pregnancy. Alcohol is considered a teratogen that impacts fetal growth and development at all stages of pregnancy. Women would do well to remember that the major part of organogenesis occurs in the first trimester (first 12 weeks) of pregnancy. All international guidelines from professional bodies advocate complete abstinence in pregnancy. No half measures are safe as far as alcohol is concerned. Abstaining from alcohol while pregnant eliminates the risk of alcohol-related birth defects and developmental disabilities, including resultant neurocognitive and behavioral problems. It must be remembered that alcohol will pass through the transplacental circulation into the fetus. Once circulating in the fetus, elimination occurs at 3-4% compared to that of the maternal circulation. Alcohol that is secreted into the amniotic fluid is swallowed again by the fetus and be excreted back into the amniotic fluid by fetal urination.

Alcohol has the potential to cause harmful internal or somatic effects at all stages of gestation. During first trimester, significant intake of alcohol is associated with facial anomalies and major structural anomalies, including brain anomalies; exposure in the second trimester increases the risk of spontaneous abortion; exposure in the third trimester predominantly affects weight, length, and brain growth. However, neurobehavioral effects may occur with a range of exposures throughout gestation, even in the absence of facial or structural brain anomalies. Neuroimaging and pathologic studies in humans and animal models of prenatal alcohol exposure demonstrate abnormal brain structure and function following prenatal alcohol exposure. Influence of ethanol that changes in normal functions of memory, coordination, perception, judgement and ability work. In addition, alcohol-induced epigenetic alterations may disrupt normal developmental gene expression. The fetus with fetal alcohol syndrome is typically described as having a facies with short palpebral fissures, thin vermillion border and short philtrum, central nervous system abnormalities and growth retardation. Laboratory testing in patients with suspected alcoholic liver disease includes testing for evidence of hepatitis and liver synthetic dysfunction.

Identification and counselling of women who use alcohol can decrease intake during pregnancy. A number of screening tools are available to screen pregnant women. Clinicians should use one that is appropriate for their setting and population. Intervention sessions with counselling can be done for those who are not heavy drinkers. For those who are, professional help should be sought.

**Conclusion**

Alcohol remains a major cause of social ills and health burden. Many studies have confirmed that alcohol induced oxidative stress leads to mortality such as liver toxicity, renal failure, cardiovascular diseases and adverse effects of pregnancy. Preventive aspects are critical in the effort to reduce this burden. Getting a history of the level of alcohol intake in every patient irrespective of social class or gender is an important first step in this effort. Counselling and professional help are the next steps depending on the level of alcohol intake.
Competing Interest: The authors declare no competing interest

What is known about this topic?

- Chronic consumption of alcohol can cause oxidative stress and pathogenesis of disease.
- Alcoholic liver disease ranges from steatosis to fibrosis and ultimately the patients develop cirrhosis
- Intake of alcohol during pregnancy results in fetal alcohol effects and fetal alcohol syndrome

What is this study adds?

- Reactive oxygen species to develop lipid peroxidation of liver cell membranes and this leads to tissue damage
- Chronic intake of ethanol accelerates hepatic viral infections

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Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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The Effect on Bonding Behavior Model of a Husband for a Successful Breastfeeding

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ABSTRACT

The exclusive breastfeeding percentage given to a baby in Indonesia in 2018 was 37%. It was still far away from the WHO’s target that is 50%. The successful breastfeeding does not only belong to a wife’s responsibility but it belongs to husband. This research is aimed at knowing the effect of a husband’s bonding behavior model on the knowledge improvement, the husband’s attitude and bonding behavior to the successful exclusive breastfeeding.

This research used an experimental quasi design and was conducted from February up to March 2019. Its samples comprises of 31 respondents in intervening group and 31 respondents in controlling one. The respondents are the husbands having wives whose pregnancy ages range ≥36 weeks in the Regency of Bungo. The data analysis used is the test of McNemar and Chi Square. The intervening is done with husband’s bonding behavior module for the successful exclusive breastfeeding as long as 8 days.

The research result showed that the husband’s bonding behavior model is able to significantly improve the knowledge (p<0,0001), attitude (p<0,0001), and husband’s bonding behavior (p<0,0001). There is a meaningful difference found in knowledge, attitude, and behavior of husband’s bonding between kelompok controlling group and intervening one.

The husband’s good bonding behavior is meaningfully influential to the successful exclusive breastfeeding.

Keywords: exclusive breastfeeding, husband’s bonding behavior

Introduction

The breastfeeding is the best food for a baby since the exclusive breastfeeding given to the baby could maximize the baby’s growth, to improve the development of the baby’s intelligence, to minimize the baby’s morbidity and mortality as well as to distance the pregnant frequency¹,². WHO intended to promote the exclusive breastfeeding given given to the baby, at least, 50% in 2025³. Based upon the WHO’s data in 2016, the coverage level of exclusive breastfeeding given across the world is still below the target approximately 38%³.

In Indonesia, in 2018, the coverage level of exclusive breastfeeding given did not achieve the target of 37% either⁴. In Jambi Province, the coverage of baby milking the exclusive breastfeeding until six months old merely 27.2% whereas in the Regency of Bungo just reach 21% lower than the target or national achievement⁵.

Majorly, the wives come across a difficulty practicing to give exclusive breastfeeding within the community, health care experience, place and job type, and even their own families. everybody plays a role in helping a wife to surmount the hindrance from being successful to give the exclusive breastfeeding. The husband, particularly, could be one of the important roles and source of the strongest support in helping the wife to manage in giving the exclusive breastfeeding⁷. Based upon the previous study and field experience it showed that the failure of asking the husband to participate and to empower

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him in intervening the behavior change could inhibit both the efficacy and the effectiveness of program. The promotional effort to give an exclusive breastfeeding has set up a target to the wife but the husband seems to be out of participation\textsuperscript{8}.

Research Abbass-Dick, showed that the husband informed and supported the exclusive breastfeeding given\textsuperscript{9}. This research suggests that the successful exclusive breastfeeding given does not only belong to the responsible of a wife. The husbands are considered the part of co-parenting team that is to collaborate with the wife to achieve the purpose of exclusive breastfeeding commonly intended and he does not only function as to support the wife\textsuperscript{10}. Moreover, significantly, more wives in intervening group were satisfied with their couple’s involvement in the breastfeeding practice as many as 89\% compared to the one of control as many as 78,1\% under $p=0,04$\textsuperscript{11}.

The husband’s involvement is influenced by knowledge, attitude and behavior of the husband. The Februhartanty’s research on husband’s role in optimizing the practice of breastfeeding in Wilsuami, Urban of Jakarta showed that the husband having a good knowledge of breastfeeding preserves good and harmonious relationship between both wife and baby\textsuperscript{12}.

The husband’s positive attitude is supported by a good knowledge of breastfeeding. Without sufficient knowledge of exclusive breastfeeding given, the husband will tend to behave negatively to the practice of breastfeeding given and a plan to give a formulated milk to the baby.\textsuperscript{13} The attitude represents the specific reliability of implementing a behavior including the experience attitude (emotional response toward the idea of practicing behavior) and instrumental attitude (reliability on the possibility or the potential result of behavior)\textsuperscript{14}.

The husbands said that they appreciate if they are specifically informed what role to play. This showed that the particular information is to target the husbands that they are not only well accepted by their wives but are also effective in promoting their involvements\textsuperscript{15}. This research is the quantitative research of the continuity titled Model of Husband’s Bonding Behavior (HBB) for The Success Of Exclusive Breastfeeding In Rural Sumatra.\textsuperscript{9} This research intends to re-evaluate the HBB model over the promotion of knowledge, the change of both husband’s bonding attitude and behavior to the successful exclusive breastfeeding.

\section*{Method}

This research made use of experimental quasi design done from February to March 2019. The research sample comprised from 31 respondents in intervening group and 31 respondents in controlling group. The respondents were the husbands having wives whose pregnancy age are $\geq$36 weeks in the area of Bungo Marketplace and District of Pelepat, Regency of Bungo. This research made use of multistage random sampling technique. The data analysis implemented McNemar and Chi Square test with the reliable degree 95\%.

Educational Module of husband’s bonding behavior as a media in defining model of husband’s bonding behavior. The interning would be done under the educational module for 8 days. The monitoring in the husband’s change bonding behavior was conducted during 66 days. The education was done by the ways of 1) Education I: explanation of intention and learning material based upon the module; 2) Education II: individual learning with various modules for each participant and is asked to learn at home at least10 minutes per day during six days.

\section*{Result and Discussion}

Respondents characteristic was intended to see the husband’s characteristic frequency. The husband’s characteristic in this research was based upon education, age group, and wife’s job.

\begin{table}[h]
\centering
\caption{Respondent Characteristic in Intervening and Control Groups}
\begin{tabular}{|l|c|c|}
\hline
Respondent Characteristic & Controlling Group & Intervening Group \\
& $f$ & ($\%$) & $f$ & ($\%$) \\
\hline
\textbf{Education} & & & \\
Elementary School & 5 & 16,1 & 5 & 16,1 \\
Junior High School & 16 & 51,6 & 8 & 25,8 \\
Senior High School & 7 & 22,6 & 14 & 45,2 \\
College & 3 & 9,7 & 4 & 12,9 \\
\hline
\textbf{Age Group} & & & \\
$<35$ Years & 23 & 74,2 & 22 & 71,0 \\
35-45 Years & 5 & 16,1 & 8 & 25,8 \\
$>45$ Years & 3 & 9,7 & 1 & 3,2 \\
\hline
\textbf{Wife’s Job} & & & \\
Household & 21 & 67,7 & 24 & 77,4 \\
Private Company & 6 & 19,4 & 1 & 3,2 \\
\hline
\end{tabular}
\end{table}
Conted…

Table 1. Showed that major respondents (51.6%) in controlling group were educated up to junior high school meanwhile in the intervening group majorly as many as 45.2% were educated up to senior high school. The distribution of respondent’s age group either controlling or intervening one were majorly in the age group of <35 years. The distribution of wife’s job were majorly in the controlling group as many as 67.7% and the intervening one as many as 77.4% worked as housewives.

Table 2: Knowledge, Attitude and Husband’s Bonding Behavior in Both Intervening and Controlling Groups

<table>
<thead>
<tr>
<th>Bonding Behavior</th>
<th>Controlling Group</th>
<th>Intervening Group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing</td>
<td>3</td>
<td>31</td>
<td>0.9</td>
</tr>
<tr>
<td>Decreasing</td>
<td>28</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>31</td>
<td>0.0</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>4</td>
<td>31</td>
<td>0.0</td>
</tr>
<tr>
<td>Negative</td>
<td>27</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>31</td>
<td>0.0</td>
</tr>
<tr>
<td>Bonding Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td>30</td>
<td>0.0</td>
</tr>
<tr>
<td>Bad</td>
<td>15</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>31</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 2 showed that the husband’s knowledge in the controlling group increased up to 9.7% meanwhile it increased up to 0% in intervening group. Statistically, there was a meaningful difference in the knowledge increase between the controlling group and the intervening one (p < 0.0001).

Table 2 showed that the husband’s bonding behavior in a good controlling group is as as many as 51.6% whereas the good intervening one is as many as 96.8%. Statistically, there is a meaningful difference of husband’s bonding behavior between the controlling group and the intervening one (p < 0.0001).

The effect of husband’s bonding behavior model for a successful exclusive breastfeeding given could be seen on the following table:

Table 3: Husband’s Bonding Behavior For Successful Exclusive Breastfeeding

<table>
<thead>
<tr>
<th>Husband’s Bonding Behavior</th>
<th>Exclusive Breastfeeding</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Good</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>Bad</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>24</td>
</tr>
</tbody>
</table>

Table 3 showed that the percentage of the exclusive breastfeeding given is higher than in the good husband’s bonding behavior compared to the one of bad husband’s bonding behavior that is as as many as 83.9% to 36.7%. Statistically, there is a meaningful difference (p<0.0001). It meant that the husband’s bonding behavior model is meaningfully influential to the successful practice of exclusive breastfeeding given.

Discussion

A better part of respondents in this research at the intervening group are educated up to senior high school whereas the one at the controlling one are educated up to junior high school. The result of this research is in line with Abera’s et al., showing that almost a half as many as 42% out of husbands taking the senior high school course up to the college one. However, the majority as many as 54.7% out of the husbands only took the education up to elementary school. The husbands taking education up to senior high school are 4.9 times more possible to get involved well in the practice of giving the exclusive breastfeeding rather than those only taking education up to elementary school (AOR = 4.961, 95% CI = 2.483, 9.91).

Respondent’s average age, either in intervening group or in the controlling one, mostly are in the age group <35 years. The result of this research does not
come along together with Abera’s *et al.*, showing that the husband’s average age is 35.64 (SD + 6.023) years. Approximately a half 209 (50.1%), the husbands are over 35 years old whereas 176 (42.2%) in the range of 25 years up to 35 years old and the rest is 32 (7.7%) are under 25 years old.\(^6\)

In this research, the husbands having good perceptions to their husband’s involvement in milking practice tend to be involved more in breastfeeding given. This finding is in line with the one conducted by Abbas-Dick *et al.*, in which the husband is ignored during the pregnancy - baby birth cycle as they are prohibited by their wives from participating in the breastfeeding process\(^{6,17}\).

The research result showed that there is a difference found among the respondents found during both pretest and post-test in the intervening group but there is no difference found among the controlling one. It also showed the respondent’s interaction between the controlling group and the intervening one. Based upon the theory of behavioral change elaborating it that could happen through a learning process such as information given through a counseling or an education. The learning process could bring about the visible change and it take a long time.

Based on the result of analysis, it showed that the good husband’s bonding behavior preserved a significant relationship to the successful exclusive breastfeeding given. Roesli said that the husband is an important part in defining either success or failure of exclusive breastfeeding given so that the husband could play an active role for the successful exclusive breastfeeding given by the behavior emotionally or passionately and gave other practical helps such as replace the diaper or pick up the baby. This important role is the first step for the husbands to support their wives in order to manage giving the exclusive breastfeeding\(^18\).

The exclusive breastfeeding could be beneficial for it is able to improve the child’s life quality. However, there are many conditions that are not understood by the husbands. Husbands play roles to create a comfortable environment for their wives so that their both physical and psychological conditions always fit. The husband’s support could be in form of his ability described as the husband’s knowledge, practical help, and information related to the exclusive breastfeeding given. The knowledge possessed by a husband would influence the supporting and and parenting as well as influencing the wife to feel more optimistic and more confident to exclusively breastfeeding\(^19\).

**Conclusion**

The husband’s bonding behavior model is able to meaningfully promote knowledge, behavior, and husband’s bonding behavior. There is a meaningful difference of knowledge, attitude, and bonding behavior of the husband between the controlling group and the intervening one. The good husband’s bonding behavior is meaningfully influential to the successful breastfeeding given.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

**Gratitude:** Our thanks go to the respondents, The Head of Medical Service of Bungo Regency, Village’s Nurse, PKK, and religious leaders.

**Ethical Consent:** The ethical consent is acquired from the Faculty of Medicine, University of Andalas Padang. 670/KEP/FK/2018.

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Reduction Turbidity of Water in Tikrit Drinking Water Treatment Plant by Using Alum Which was Quantified by a Jar Test Apparatus, with limnological Study of Treated and Raw Water

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¹Department of Biology, College of Science, University of Tikrit

ABSTRACT

Tigris river is a major source of water for drinking, agricultural and industrial desires in Iraq. The quality of drinking water is very important because it is related to the health of people. For this purpose, we assess the quality of drinking water in the city of Tikrit with some physical-chemical parameters which have a significant role in determining the potability of drinking water. The obtained results were compared with the permissible limits for universal standards of drinking water such as Environment Protection Agency (EPA), World Health Organization (WHO), etc.

In this study, two samples of water within Tikrit drinking water treatment plant were taken, the first sample was the raw water (Tigris River) which is a water source project, and the second sample represents treated water in the Tikrit drinking water project.

All the physical and chemical parameters (Conductivity, pH, Chloride and Total Alkalinity) were found to be within the safe limit values except turbidity and aluminum levels of treated water in some months.

Turbidity is a principle physical characteristic of water, excessive turbidity in drinking water is aesthetically unappealing and may also represent a health concern.

Generally, alum is the first coagulant of choice because of its lower cost and its widespread availability. The coagulation performance of alum, an inorganic chemical coagulant was used to remove the turbidity of raw water, but the problem with the use of alum as a coagulant for water treatment often leads to higher concentrations of aluminum in the treated water than in the raw water itself.

Jar tests were carried out to optimize alum dose in most months of the current study. Results showed that the efficiency of alum has been high in reducing values, but it is necessary to choose the lowest doses of alum and appropriate in reducing the values of turbidity to be within the permissible limits to avoid increasing the concentration of aluminum in treated water, especially that increasing the concentration of aluminum in drinking water has a risk to human health.

Results showed an increase in concentrations of aluminum in treated water in some months through recording values exceeded the permissible limits (Maximum Permitted Level 0.2 mg/L) according to the universal standards of drinking water due to excessive doses of alum added to sedimentation basins at Tikrit drinking water treatment plant.

Keywords: Drinking water, Jar test apparatus, alum dosage, turbidity removal, aluminum concentration.

Introduction

The population growth and lack of infrastructure had made it a serious problem to get safe drinking water for people in developing countries, such as Iraq.¹ Water from all sources must have some form of purification before consumption. Various methods are used to make water safe and attractive to the consumer. One of the problems with treatment of surface water is the large seasonal variation in turbidity.²⁺³
Turbidity may contain many contaminants like pathogenic organisms. Thus, effective turbidity elimination is necessary to ensure removal of many health-related contaminants. Alum and Ferric Chloride are the most commonly used chemical coagulants worldwide in the water treatment plants for over a hundred years all over the world.

In this study Alum was used as a chemical coagulant in the Tikrit drinking water treatment plant. The removal of turbidity from water is important because colloids may directly or indirectly threaten the human health.4

The use of alum as a coagulant for water treatment often leads to higher concentrations of aluminum in the treated water than in the raw water itself.5

Water that contains more than 0.2 mg aluminum per liter should not be used for drinking water or to prepare beverages or infant formula. It is safe to use this water for other purposes such as bathing, showering and household chores.6

**Studying Area:** The study area is located in district of Tikrit in the province of Salah Al-Din which is located in the north of Baghdad, the capital of Iraq, between latitude (77.37’34 N) and longitude (24.20’4339 E) (Figure 1)

The study area included taking two samples of water within Tikrit drinking water treatment plant. The first sample was raw water (Tigris River) (one of the most important sources of fresh water in Iraq), which is the source of feed for Tikrit drinking water project, which is pulled into the project by pumps, and the second sample represents treated water in the Tikrit drinking water treatment plant, which is pumped to consumers.

**Description of Tikrit drinking water treatment plant:** This project is located in the center of Tikrit district away 1 km from the Tigris River on the left side of the river. It consists of 4 large sedimentation basins and also contains 14 sand filters. The operational capacity of the project is estimated at about 49000 cubic meters per day, which feeds the people of the area with drinking water after the disinfection of water by chlorination process. The source of this project is Tigris river.

![Figure 1: Maps of Iraq, including the distract of Tikrit and location of the Tikrit Drinking Water Project](image)

**Materials and Method**

**Samples Collection:** Samples were collected, on a monthly basis for a period of eight months from February to the end of December 2018.

Water samples were taken for physical and chemical analysis, using poly-ethylene bottle which had been washed twice with water sample before filling it.7

**Studying Stations**

**First Station:** The sample of water in this station was taken from water entering to the Tikrit drinking water project, which is water from the Tigris River.

**Second Station:** The sample of water in this station was taken from treated water in the Tikrit drinking water project, which is pumped to consumers.
Physical and chemical analysis

The parameters were checked in laboratory of Tikrit drinking water treatment plant. The methods for analyzing these parameters are shown in Table (1).

Table 1: Standard methods for field and laboratory measurements

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameters of Water</th>
<th>Units</th>
<th>Device name or Tools</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Temperature</td>
<td>°C</td>
<td>Mercuric Thermometer</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Turbidity</td>
<td>NTU</td>
<td>Turbidity meter</td>
<td>APHA (^7)</td>
</tr>
<tr>
<td>3</td>
<td>Electrical conductivity</td>
<td>μS/cm</td>
<td>Multi parameter analyzer EC, pH meter HANNA Instruments</td>
<td>(APHA) (^7)</td>
</tr>
<tr>
<td>4</td>
<td>pH</td>
<td>-</td>
<td>Multi parameter analyzer EC, pH meter HANNA Instruments</td>
<td>(APHA) (^7)</td>
</tr>
<tr>
<td>5</td>
<td>Chloride</td>
<td>mg/L</td>
<td>Titration with AgNO(_3) (0.025N)</td>
<td>(ASTM) (^8)</td>
</tr>
<tr>
<td>6</td>
<td>Total Alkalinity</td>
<td>mg/L expressed as CaCO(_3)</td>
<td>Titration with H(_2)SO(_4) (0.02N)</td>
<td>(Lind) (^9)</td>
</tr>
<tr>
<td>7</td>
<td>Aluminum</td>
<td>mg/L</td>
<td>spectrophotometer model (Thermo Electron Corporation) at the wavelength (535 nm)</td>
<td>(APHA) (^7)</td>
</tr>
</tbody>
</table>

Jar Testing Procedures: In Jar test procedure was used alum (aluminum sulfate Al\(_2\) (SO\(_4\))\(_3\).18H\(_2\)O) a chemical for coagulation/flocculation in Tikrit drinking water Project, and a typical six-gang jar tester. The results of this device are used to improve the performance of water projects to supply low turbidity water, the procedures of Jar test were as following:

1. Was used a 1000 mL graduated cylinder, then has been added 1000 mL of raw water (Tigris river) to each of the jar test beakers. Were recorded turbidity of the raw water before beginning.

2. Prepared a stock solution by dissolving 1 grams of alum into 1000 mL distilled water. Each 1 mL of this stock solution will equal 1 mg/L (ppm) when added to 1000 mL of water to be tested.

3. Was Used the prepared stock solution of alum, dose each beaker with increased amounts of the solution. Table (2) shows the additions and doses of alum used in the study.

4. After dosing each beaker, were turned on the stirrers. This part of the procedure should reflect the actual conditions of the plant as much as possible. Meaning, if the plant has a static mixer following chemical addition, followed by 30 minutes in a flocculator, then 1.5 hours of settling time before the filters, then the test also should have these steps. The jar test device was operated as follows: Operated the stirrers at a high RPM for 1 minute to simulate the static mixer. Then reduced the speed of the stirrers to match the conditions in the flocculator and allow them to operate for 30 minutes. Observed the floc formation periodically during the 30 minutes. At the end of the 30 minutes turned off the stirrers and allowed settling. Most of the settling was completed after one hour. \(^{10}\)

Table 2: Shows the additions and doses of alum

<table>
<thead>
<tr>
<th>Beakers of Jar test</th>
<th>mL Alum Stock Added</th>
<th>mg/L Alum Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(Blank)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Statistical Analysis: The results of this study were analyzed statistically using analysis of variance test (F test), and has been compared the means by a polynomial Duncan test in level of 0.05 and 0.01. \(^{11}\)

Results

Water Temperature: The results revealed that temperature of water values were ranged between (10–30.5 °C) during the study period. The highest value was in June at raw water (Tigris River), while the lowest value was recorded at same location in February (Figure 2).
The statistical analysis according to the analysis of variance for water temperature showed no significant differences between the raw and treated water stations, with a significant difference at (P≤0.01) between some months of the study (as shown in table 3).

**pH and Total alkalinity:** The results revealed that pH values of water were ranged between (7.47 - 8.53) during the study period. The highest value was in April at raw water (Tigris River), while the lowest value was recorded at water project in February (Figure 2).

The values of total alkalinity were ranged between (83-128) mg/L expressed as CaCO$_3$. The highest value was in July at raw water (Tigris River), while the lowest value was recorded at water project in August (Figure 2).

**Chloride:** In the present study the results of chloride concentrations were ranged between minimum value 12 mg/L and maximum value 51.94 mg/L (Figure 2).

The statistical analysis according to the analysis of variance for water temperature showed no significant differences between the raw and treated water stations, with a significant difference at (P≤0.01) between months of the study (as shown in table 3).

**Electrical Conductivity (EC):** The maximum value (493.02 µS/cm) was recorded at water project in May and the minimum value (370 µs/cm)) was recorded at raw water (Tigris river) in February (Figure 2).

The statistical analysis according to the analysis of variance for electrical conductivity showed a significant differences at (P≤0.01) between some months of the study, while there are no significant differences between the raw and treated water stations (as shown in table 3).

**Turbidity, Aluminum and Jar test results:** In the present study water turbidity values at raw water (Tigris River) ranged between (7.1 - 153) NTU, the highest value at raw water was in April, and the lowest value was recorded in August as shown in Figure 2. While water turbidity values at treated water (water project) ranged from 3.75 to 7.6 NTU, the highest value was recorded in June, and the lowest value was in May.

As illustrated in Figure (2) the results revealed that the aluminum values at raw water (Tigris river) ranged between (0.014 - 0.078 mg/L), the highest value was recorded in June, while the lowest value was in July.

At treated water (water project) the concentration of aluminum was recorded ranged from 0.014 to 2.68 mg/L, the highest value was recorded in April, and the lowest value was in September.

Through the Figure (2), a correspond was observed in the rise and decline in the values of both turbidity and the concentration of aluminum in the raw water during the months of April, May and June, this increase and decrease in turbidity reflected its effect on aluminum concentrations in the treated water (water project).

Figure 3 (a - f) presents the results obtained for Jar test study performed on raw water (Tigris river) samples using alum (Aluminum sulfate) tested within (5 - 25 mg/L) dose range. The red dots in the figure 3 (a-f) refer to the concentrations of the selected alum dosage used in sediment basins in the water project.
Figure 2: Monthly variations of parameters in the studied stations

(a) Jar test results in February

(b) Jar test results in March

(c) Jar test results in April
Figure 3: Effect of alum doses on turbidity removal in a Jar test apparatus

Notes: 1. The red dots in the figures represents alum dosage used in the water project.

2. At April, alum was added randomly in sediment basins by the staff.

Table 3: Minimum, maximum values and average mean recorded for physical and chemical parameters for the study area during February to the end of December 2018

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Station</th>
<th>Mean ± S.E (Station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water temperature (°C)</td>
<td>Raw Water (Tigris River)</td>
<td>10–30.5 a (23.16 ± 6.79)</td>
</tr>
<tr>
<td>Turbidity (NTU)</td>
<td>Raw Water (Tigris River)</td>
<td>7.1-153 a (66.5 ± 62.6)</td>
</tr>
<tr>
<td>Electrical Conductivity (µs/cm)</td>
<td>Raw Water (Tigris River)</td>
<td>345.7- 488.75 a (401.2 ± 42.1)</td>
</tr>
<tr>
<td>pH</td>
<td>Raw Water (Tigris River)</td>
<td>8.1-8.53a (8.291 ± 0.172)</td>
</tr>
<tr>
<td>Chloride (mg/l)</td>
<td>Raw Water (Tigris River)</td>
<td>12-34.65a (23.16 ± 7.86)</td>
</tr>
<tr>
<td>Total Alkalinity (mg/l)</td>
<td>Raw Water (Tigris River)</td>
<td>110-128 a (113.6 ± 12.8)</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Raw Water (Tigris River)</td>
<td>0.014-0.078 a (0.0409 ± 0.0292)</td>
</tr>
</tbody>
</table>
Discussions

**Water Temperature:** The results of the current study showed clear monthly variations in the temperature of the water and these differences back to the climate differentiation through the seasons of the year. Temperature values for this present study showed marked seasonal variation. Higher water temperature values recorded in the dry season months in the present study are expected since temperature from sunlight increases temperature of surface water.

**pH and Total alkalinity:** The recorded values of pH in this study for both locations were within the standard limits for drinking water recommended by the World Health Organization (6.5 - 8.5) and (6.5 - 9.5) respectively. The desirable limit for total alkalinity is 200 mg/L expressed as CaCO$_3$. The results of the present study, as in Figure (2), show that the pH values and alkalinity values of the raw water (Tigris river) are higher than the water of the Tikrit project in most months of the study, these results were confirmed by statistical analysis with a significant difference at (P<0.01) between the two stations for pH parameter (as shown in table 3), that may be because when alum is added to a water containing alkalinity, the following reaction occurs:

\[
\text{Al}_2(\text{SO}_4)_3\cdot18\text{H}_2\text{O}+6\text{HCO}_3^- \leftrightarrow 2\text{Al(OH)}_3 + 6\text{CO}_2 + 18\text{H}_2\text{O} + 3\text{SO}_4^{2-}
\]

Such that each mole of alum added uses six moles of alkalinity and produces six moles of carbon dioxide. The above reaction shifts the carbonate equilibrium and decrease the pH. However, as long as sufficient alkalinity is present and CO$_2$ is allowed to evolve, the pH is not drastically reduced and is generally not an operational problem. When sufficient alkalinity is not present to neutralize the sulfuric acid production, the pH may be greatly reduced: \[
\text{Al}_2(\text{SO}_4)_3\cdot18\text{H}_2\text{O} \leftrightarrow 2\text{Al(OH)}_3 + 12\text{H}_2\text{O} + 3\text{H}_2\text{SO}_4.
\]

**Chloride:** In the present study chloride concentrations in both locations were within the standard limits for drinking water recommended by the (ODWS; WHO and EPA) Maximum Permitted (250 mg/L).

Chloride is considered to be pollution indicating parameter and it is responsible for the salty taste of water, chloride present in water originates from both natural and anthropogenic sources.

**Electrical Conductivity (EC):** The values obtained in all sampling sites were within the standard value of (SON) drinking water quality which is 1000 μs/cm and within the standard value of (EPA) drinking water quality which is 2500 μs/cm so they are good for use.

Figure (2) shows that all electrical conductivity values of the water project were relatively higher than the conductivity values of the raw water (Tigris River), this may be due to daily additions of alum in the water project which are used as a chemical coagulant to reduce water turbidity, especially that conductivity of water depends upon the concentration of ions and its nutrient status and variation in dissolve solid content. Seasonal variation in the conductivity is mostly due to increased concentration of salt because of evaporation.

**Turbidity, Aluminum and Jar test results:** Through the results all of the observed values of turbidity at raw water (Tigris river) were high (more than the permissible level 5 NTU recommended by the ODWS, SON, WHO, EPA etc. for drinking water) therefore, this elevation in turbidity must be treated through the water project by using alum in settling basins before it reaches to consumers, these fluctuating values of turbidity at raw water (Tigris river) were natural result, due to the turbidity affected by the natural components present in water bodies like as silts, clay, silica component and other as well as may be it is affected by human activity.

Turbidity should ideally be below 5 NTU, the main reasons for the determination of drinking water with the values of turbidity less than 5 NTU that is the microorganisms (bacteria, viruses and protozoa) are typically attached to particulates, furthermore, high levels of turbidity can interfere with disinfection and protect microorganisms from the effects of disinfection. In addition to the effect of turbidity resulting from sand, silts or clay on the health of body organs as kidneys.

Therefore alum was used to reduce the water turbidity values to the permissible limits but, the use of alum as a coagulant for water treatment often leads to higher concentrations of aluminum in the treated water than in the raw water itself, typically, a portion of the alum added to the raw water is not removed during treatment and remains as residual aluminum in the treated water.

As illustrated in Figure (2), the proportions of aluminum concentrations are normal in raw water because of that aluminum (Al$^{3+}$) is the third-most-
common element in the earth’s crust and is present in all natural waters.\textsuperscript{21}

Aluminum determination at low level is of particular interest in potable water units because this metallic ion is commonly used as reactant for coagulation–flocculation in the treatment of raw waters to remove colloidal or suspended particles or to eliminate organic matter.\textsuperscript{22} At the outlet of these units, maximum tolerable level of this cation has been fixed for drinking water to (200 µg/L equal 0.2 mg/L) by the ODWS\textsuperscript{14}, SON\textsuperscript{16}, WHO\textsuperscript{12}, EPA\textsuperscript{13} etc.

The obvious increase of turbidity values in months (April, May and June) at raw water (Figure 2) coincided with the high level of the Tigris river and heavy rain, especially in April leading to the erosion of soil, sand, inorganic fertilizers on farmlands and plankton during the flow of the river.\textsuperscript{23} To remove this increase of turbidity, larger amounts of alum were used in drinking water treatment plant.

Through the results were recorded in the current study of aluminum concentration in treated water as shown in Figure (2) were observed that the values exceeded the permissible limits (0.2 mg/L) in the months April, May, June and July with values 2.68, 0.285, 0.31 and 0.268 respectively.

High concentrations of residual dissolved aluminum indicate incorrect coagulant dosing were added to raw water in sedimentation basins at drinking water treatment plant.\textsuperscript{24} Residual aluminum concentration was affected by concentration of coagulant dosage, the relationship between aluminum concentration and turbidity of water in treated water confirmed by statistical analysis which showed a negative correlation between alum dosage and turbidity in all months of the study.

Residual aluminum concentration after sedimentation and filtration in the effluent must be taken into consideration because of the health effects of aluminum. The studies on health effects of aluminum in drinking water showed that high consumption of aluminum from drinking water may be a risk factor for Alzheimer’s disease.\textsuperscript{25}

Aluminum accumulation in the brain is proposed to be associated with neurodegenerative diseases, including Alzheimer’s dementia, Parkinson’s disease, amyotrophic lateral sclerosis, and dialysis encephalopathy.\textsuperscript{26}

The laboratory staff in Tikrit drinking water treatment plant chose the alum dosages depending on the results of Jar test apparatus to ensure getting values of turbidity less than 5 NTU according to the universal standards of drinking water.

Alum dosages selected (as shown in Figure 3) in the months in which high concentration of aluminum was observed, as shown in Figure (2), was the main reason for this elevation in aluminum concentration in treated water. Therefore, it was better for the health side to select less alum dosages than those chosen, especially in months (April, May, June and July) to avoid the increase of aluminum values in the treated water, especially that the Iraqi standards of drinking water allowed the turbidity values of drinking water to reach 10 NTU.

The highest value of aluminum (a value inconsistent with other values were recorded during the current study period) was in April recorded because of the project staff didn’t rely on the Jar test apparatus in estimating the amount of alum that should be added to the sedimentation basins, but they added alum randomly, this is one of the problems that lead to a defect in the quality of drinking water.

In the last two months of the current study (August and September) no amount of alum has been added because the turbidity of raw water was under 10 NTU, after the river returned to normal level.

**Conclusion**

Coagulation-flocculation using alum (aluminum sulfate Al$_2$(SO$_4$)$_3$.18H$_2$O) is a suitable process for the removal of turbidity at drinking water treatment plant but, alum dosage which added to removal turbidity of water in water projects plays a major role in increasing the concentration of aluminum in the treated water, this increase has an impact on consumer health. Therefore, alum should be added according to the results of Jar test apparatus.

All the physical and chemical parameters were studied in this study (Conductivity, pH, Chloride and Total Alkalinity) were within the national standards such as WHO, EPA,SON, ODWS except turbidity and aluminum levels of water for Tikrit drinking water treatment plant in some months.

**Ethical Clearance: **Taken from the plagiarism committee at Tikrit University (as in the attached report).
**Source of Funding:** Tikrit University, College of Science.

**Conflict of Interest:** Nil.

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Effects of the Climacteric Symptoms, Social Support and Couple Intimacy on the Health-related Quality of Life of Married Middle-aged Women

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ABSTRACT

Purpose: The purpose of this study was to analyze the effect that climacteric symptoms, social support and couple intimacy of married middle-aged women have on the quality of their health life.

Method: The subjects of this study were 131 married middle-aged women aged between 40 and 65. The data were analyzed using descriptive statistics, t-test, ANOVA, Pearson’s correlation coefficient and stepwise multiple regression using the SPSS 22.0 program.

Results: The climacteric symptoms of subjects had a negative correlation (r=-.31, p<.001), while social support had a positive correlation (r=.38, p<.001). Couple intimacy had a positive correlation (r=.35, p<.001). The social support of married middle-aged women (β=.251, p=.005), climacteric symptoms (β=-.215, p=.009), and satisfaction with married life (β=-.193, p=.035) were found to be significant variables affecting health related quality of life. The explanatory power was 13.6% for social support, 5.6% for climacteric symptoms, 2.2% for satisfaction with married life and 21.4% for these factors altogether in explaining health-related quality of life.

Conclusion: The researchers hope that through the development of various nursing intervention programs and application of such programs to improve couple intimacy and satisfaction with married life, health related quality of life for married middle-aged women will improve.

Keywords: Married middle-aged women, Climacteric symptoms, Social support, Couple intimacy, Health-related quality of life

Introduction

The trends in female population in the past several years show that those in their 40s account for 16.2%, those in their 50s account for 16.4%, and those in their 60s account for 11.4%. This indicates that middle-aged women in their 40s to 60s take up a total of 44.0%. In terms of female employment, those in their late 40s account for the highest share of 69.7%. While up to 2011 the majority of divorces were of couples married for 4 years or less, since then the largest number of divorces occurred in couples who have been married for 20 years or longer.¹

Couple intimacy is a concept referring to emotional interaction and emphasizes non-verbal feelings or thoughts. It is the process of making efforts to feel closer with the other person in both positive and stressful situations.² Couple intimacy is an important factor in marital relations and is the main reason for marriage.³ ⁴ Lack of intimacy is a leading indicator of divorce.⁵ Factors affecting the subjective happiness of middle-aged women are sexual intimacy of the couple and communication.⁶ Recent studies show that marriage and co-habitation were correlated with positive health status.⁷ In particular, emotional support from the spouse had the most direct impact on how middle-aged
women overcame challenges, and the more positive the couple’s relationship the higher the well-being of the individual. As such, ultimately couple intimacy needs to be identified as a major factor in the healthy life of middle-aged women.

One’s middle age is when one moves on from being an adult to an elderly person. With the aging of cells, the immune system is undermined and resistance to diseases or external stress decreases, leading to higher likelihood of chronic diseases. Climacteric symptoms cause various health issues which can serve to undermine health-related quality of life. Ware and Sherbourne defined health-related quality of life as a more comprehensive concept than an individual’s health status, which covers overall health, physical function, physical role, pain, vitality, social function, and subjective evaluation in the emotional role.

Factors that affect the quality of life associated with health in middle-aged women are self-efficacy, number of chronic diseases, social support, symptoms, status of physical functions, and perceived health status. Most of the studies on health-related quality of life in middle-aged people to date have been focused on middle-aged women, but those on married middle-aged women are lacking. This study seeks to analyze the effect of climacteric symptoms, social support and couple intimacy of married middle-aged women on their health related quality of life.

Method

Subjects: Subjects of this study were sampled among married middle-aged women between age 40 and 65. Only those who voluntarily gave their consent to participation in the study were selected as study subjects. To verify the fitness of the sample size, the G*Power 3.0 program was used and a significance level of 0.05, effect size of 0.15, verification power of 0.90 and six predictive factors were applied to the regression analysis to acquire the final number of 123 subjects. A total of 131 copies were used in the final analysis.

Instruments

Climacteric Symptoms: In this study, the 20 questions from Menopause Symptom Index developed by Sarrel and revised by Jo & Lee were used, and were revised by Han. For each response, 0 point was given for ‘no’ and 2 points for ‘frequently’. A higher score indicates worse climacteric symptoms. In this study Cronbach’s α was 0.87.

Social Support: Developed by Park, the tool consists of a total of 25 questions. One point is given to ‘not at all’ and 5 points given to ‘very much so’, using a 5 point Likert scale. A higher score indicates higher social support. In this study Cronbach’s α=.90.

Couple Intimacy: The tool developed by Lee was used. For responses given to statements on couple intimacy, one point was given for ‘not at all’ and 5 points given for ‘very much so’ on a 5 point Likert scale. A higher score indicates higher couple intimacy. In this study Cronbach’s α=.94.

Health-related Quality of Life: The tool developed by Dunbar et al. and revised by Yoon et al. to fit the Korean standard was used. There are a total of 23 questions. Each question has a statements presenting two polar opposites and measured on a scale of 1-10 points. A higher score indicates a higher health-related quality of life. In this study Cronbach’s α=0.88.

Data Collection: Data were collected from November 1 to December 10, 2018. Married middle-aged women of age 40 to 65 who participate in religious groups, volunteer organizations, cultural centers and private institutions in three cities of Chungcheong region were conveniently sampled the researcher and three research assistants.

Ethical Consideration: Approval was acquired by the ethics committee of K University on the objective, methodology and protection of rights of study participants (KNU_IRB_2019_17). During the study period the guidelines on ethical studies were observed.

Data Analysis: Using the SPSS/WIN 21.0 program, the general characteristics and variables were analyzed for frequency, percentage, mean and standard deviation. The correlation between the subjects’ variables was analyzed using Pearson’s correlation coefficients. The difference in health-related quality of life across different general characteristics was analyzed using a t-test, ANOVA and Scheffe test. Multiple regression analysis was conducted to analyze the factors affecting the subjects’ health-related quality of life.
Results

General Characteristics of Subjects: The average age of subjects was 51.3 years, with those aged 50–59 accounting for the largest share of 47.3%. The majority of the subjects at 49.6% had high school as their final education. Those married for 20-29 years accounted for the largest share at 49.6%. Those satisfied with their marriage accounted for the largest share of 45.8%, and in terms of monthly periods, those who had a regular period accounted for the largest share at 46.6%. Those who did not have a hobby that they enjoyed as a couple accounted for 73.3%, and those who were not on any medication took up 71%.

Climacteric symptoms, social support, couple intimacy and health-related quality of life in subjects

The subjects’ climacteric symptoms scored .59 points out of 2 points, and social support scored 3.79 points out of 5 points. Couple intimacy scored 3.39 points out of 5 points and health-related quality of life scored 7.03 points out of 10 points (Table 1).

Table 1: Climacteric symptoms, social support, couple intimacy and health-related quality of life in subjects

<table>
<thead>
<tr>
<th>Item</th>
<th>M ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climacteric symptoms</td>
<td>.59 ± .35</td>
<td>0–2</td>
</tr>
<tr>
<td>Social support</td>
<td>3.79 ± .70</td>
<td>1–5</td>
</tr>
<tr>
<td>Couple intimacy</td>
<td>3.39 ± .71</td>
<td>1–5</td>
</tr>
<tr>
<td>Health-related quality of life</td>
<td>7.03 ± 1.50</td>
<td>1–10</td>
</tr>
</tbody>
</table>

Correlation between climacteric symptoms, social support, couple intimacy and health-related quality of life in subjects: With health-related quality of life, climacteric symptoms had a negative correlation (r=-.31, p<.001), social support had a positive correlation (r=.38, p<.001), and couple intimacy had a positive correlation (r=.35, p<.001) (Table 2).

Table 2: Correlation between climacteric symptoms, social support, couple intimacy and health-related quality of life in subjects

<table>
<thead>
<tr>
<th>Item</th>
<th>Climacteric symptoms r(p)</th>
<th>Social support r(p)</th>
<th>Couple intimacy r(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health-related quality of life</td>
<td>-.31 (&lt;.001)</td>
<td>.38 (&lt;.001)</td>
<td>.35 (&lt;.001)</td>
</tr>
</tbody>
</table>

Difference in health-related quality of life across general characteristics: There was a difference in health-related quality of life across general characteristics (F=3.60, p=.030), with the difference being the greatest in those of an educational background of middle school or lower. There was also a difference in health-related quality of life across different levels of marriage satisfaction (F=5.48, p<.001) (Table 3).

Table 3: Difference in health-related quality of life across general characteristics (N = 131)

<table>
<thead>
<tr>
<th>Item</th>
<th>Response</th>
<th>M ± SD</th>
<th>t or F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>40–49</td>
<td>6.93 ± 1.52</td>
<td>.65</td>
<td>.522</td>
</tr>
<tr>
<td></td>
<td>50–59</td>
<td>7.18 ± 1.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 or higher</td>
<td>6.77 ± 1.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Middle school or lower</td>
<td>7.57 ± 2.12</td>
<td>3.60</td>
<td>.030</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>6.70 ± 1.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>7.29 ± 1.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of marriage (years)</td>
<td>10–19</td>
<td>7.16 ± 1.58</td>
<td>.69</td>
<td>.560</td>
</tr>
<tr>
<td></td>
<td>20–29</td>
<td>6.87 ± 1.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30–39</td>
<td>7.32 ± 1.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 years or longer</td>
<td>6.84 ± .99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with marriage</td>
<td>Very satisfieda</td>
<td>7.72 ± 1.57</td>
<td>5.48</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Satisfiedb</td>
<td>7.39 ± 1.16</td>
<td></td>
<td>(a, b&gt;east)</td>
</tr>
<tr>
<td></td>
<td>So-soe</td>
<td>6.70 ± 1.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Somewhat dissatisfiedd</td>
<td>5.89 ± .68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very dissatisfiede</td>
<td>4.15 ± 1.87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Factors affecting health-related quality of life: Health-related quality of life was set as a dependent variable for a multiple regression analysis. The self-correlation coefficient of Durbin-Watson was 2.043, and VIF value was 1.074~1.350 which is smaller than 10, indicating that there were no issues of multi-linearity. The analysis showed that social support (β=.251, p=.005), climacteric symptoms (β=-.215, p=.009), and satisfaction with married life (β=-.193, p=.035) had a significant effect on health-related quality of life. The regression analysis was statistically significant (F=12.68, p<.001), with the combined explanatory power of social support, climacteric symptoms and satisfaction with marriage being 21.4% (Table 4).

Table 4: Factors affecting health-related quality of life

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Adj R²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td>.538</td>
<td>.190</td>
<td>.251</td>
<td>2.83</td>
<td>.005</td>
<td>.136</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climacteric symptoms</td>
<td>-.906</td>
<td>.340</td>
<td>-.215</td>
<td>-2.66</td>
<td>.009</td>
<td>.192</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with marriage</td>
<td>-.369</td>
<td>.173</td>
<td>-.193</td>
<td>-2.13</td>
<td>.035</td>
<td>.214</td>
<td>12.68</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Discussion

The health-related quality of life in married middle-aged women was 7.03 points on a scale of 1 to 10, which was higher than average. This was lower than in a study conducted on middle-aged women where it was 6.73 points. In a study on both middle-aged men and women the score was 79.5 points (on a scale of 1 to 100 points) which was higher than in this study. As such, while a nursing intervention method must take into account whether the subject has a partner and which gender they are, an iteration of the study also seems necessary with a wider array of subjects as the findings differ across different studies.

A review of the correlation between the health-related quality of life and other variables showed that climacteric symptoms had a negative correlation, while social support and couple intimacy had a positive correlation. Fewer climacteric symptoms, higher social support and higher couple intimacy were correlated with higher health-related quality of life. This is similar to the study results where climacteric symptoms had a negative correlation with health-related quality of life. In addition, there was a net correlation between couple intimacy and quality of life, which is a similar result to that of this study. As in this study, climacteric symptoms and social support were identified as factors affecting health-related quality of life, and social support affected not only health-related quality of life but also health behaviors and symptoms. Moss and Schwebel noted that couple intimacy, compared to satisfaction with marriage, takes the aspect of mutual emotional, cognitive, physical closeness and dedication more seriously. Programs to help improve couple intimacy in middle-aged couples would need to be operated in local communities.

Factors affecting the health-related quality of life in married middle-aged women were social support, climacteric symptoms and satisfaction with married life. In preceding studies, social support was found to have a direct effect on climacteric symptoms to ease the symptoms and depression, and greater family support was correlated with improved quality of life. In a study conducted on middle-aged women, social support was found to mitigate climacteric symptoms through direct effect on quality of life, with higher perceived support from family or friends associated with lower degrees of climacteric symptoms. More severe climacteric symptoms were associated with lower quality of life, indicating that climacteric symptoms affect health-related quality of life.
Moreover, the level of satisfaction with married life was also found to be a factor affecting health-related quality of life in married middle-aged women. This is similar to the conclusion of a preceding study where those who enjoyed hobbies with their spouse had a higher couple intimacy and those with higher family support had higher couple intimacy. In other words, those receiving higher family support and higher support from their spouse in particular, had a higher couple intimacy and higher satisfaction level with their marriage. This indicates that higher satisfaction with married life and greater support from the spouse and family would ease climacteric symptoms and improve health-related quality of life in middle-aged women. As such, an effective nursing intervention measure must be developed by taking into account the fact that social support, climacteric symptoms and satisfaction with married life are factors affecting health-related quality of life in middle-aged women.

Conclusions

The findings of this study suggest that social support, climacteric symptoms, and satisfaction with marriage affect health-related quality of life in such women. This researcher hopes that the findings of this study will serve as a basis for developing and applying various nursing intervention programs in local communities to boost couple intimacy and satisfaction with marriage, to ultimately improve health-related quality of life in married middle-aged women. As this study conducted a survey on married middle-aged women in only a certain region of Korea, the findings cannot be generalized. It is suggested that a wider base of subjects be used for a follow-up study that can help identify additional factors that affect the health-related quality of life of married middle-aged women.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Physiological Basis for the Use of Physical Activity in Conditions of Disorders of Carbohydrate and Lipid Metabolism

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ABSTRACT

Currently, a very common variant of carbohydrate metabolism in the modern world is type I diabetes. Of the diseases associated with lipid disorders, obesity is the most common on the planet. The most effective means of physical rehabilitation in the combination of diabetes mellitus and obesity is the muscular load of moderate intensity, which involves medium and large muscles with a significant number of repetitions. During such work, per unit of time, the body energy expenditure is small, however, due to the long exercise time, the total energy consumption is significant. Aerobic mode of work contributes to the adequate absorption of glucose from the blood and its complete combustion in the muscles with a decrease in the sugar content in the blood. In addition, against the background of regular physical exertion in the body of patients, the activity of mobilization and utilization of lipid sources for energy supply of the contractile function of muscles increases. With mild and moderate severity of the disease, regular endurance training increases the overall effectiveness of the treatment of diabetes and obesity, stabilizes blood glucose and body weight, which results in a reduction in the dose of insulin injected.

Keywords: physical activity, physiology, lipid metabolism, carbohydrate metabolism, diabetes, obesity.

Introduction

The regular development of any living organism is associated with the consistent implementation of the program of hereditary information¹,². Its deployment is closely related to the influence on the body of environmental factors³,⁴. The formation of the general functional status of the organism largely depends on their positive or negative character⁵,⁶. For this reason, accurately predicting the further state of his health is quite difficult⁷,⁸. In addition, the ontogeny of the body is always accompanied by numerous age-related changes that are not always functionally beneficial⁹,¹⁰. All this determines the violation of the optimum activity of the body at any age with the development of various dysfunctions and diseases¹¹,¹². Their presence weakens the vitality of the body and the work of all internal organs. Very common among them in humans in modern society are various disorders of carbohydrate and fat metabolism¹³,¹⁴.

The most frequent variant of the disturbance of carbohydrate metabolism in the modern world is diabetes mellitus type I. According to the World Health Organization on the planet, the number of people suffering from diabetes type I increased from 108 million in 1980 to 422 million in 2014.

Of the diseases associated with lipid disorders, obesity is the most common on the planet. It is noticed that excess fat deposition in itself can worsen carbohydrate metabolism. When diabetes is combined with obesity, metabolic disorders are greatly aggravated. This significantly weakens the body and leads to the
development of numerous complications. In this regard, the aim of the paper is to consider the basics of the use of physical activity in patients with a combination of type I diabetes and obesity.

**Material and Research Method**

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

The material of the study served 43 literary sources. As methods of the study, methods of analysis and synthesis, methods of induction and deduction, and a method of generalization were used.

**Research Results**

Type I diabetes is a disease that is characterized by chronic hyperglycemia, polyuria, thirst, weight loss, a decrease or, conversely, an increase in appetite and general asthenia. Currently, there are two types of insulin-dependent diabetes: immuno-dependent and idiopathic. In immunodependent diabetes, low insulin levels are associated with the destruction of specific pancreatic cells due to an autoimmune reaction in the body. Insulin autoantibodies and pancreatic cells are detected in the patient’s blood. These antibodies disappear after the complete destruction of pancreatic cells.

In the case of idiopathic diabetes, autoantibodies are not detected. At this time, the reason for the weakening of the pancreas in this form of pathology has not been determined.

Especially often diabetes is combined with obesity, as well as increased cholesterol in the blood, lowering thyroid and adrenal gland functions, heart dysfunction, gout, osteochondrosis, inflammatory and obstructive processes in the respiratory system.

Often, obese diabetics accelerate vascular atherosclerosis, painful itching of the skin and poorly treatable skin purulent processes (boils) appear. Such patients develop diabetic changes in the kidneys, leading to hypertension, proteinuria and edema. The consequence of a metabolic disorder is a general functional weakness of the organs with its progression up to a fatal outcome.

Obesity is a disease that is characterized by metabolic disorders with excessive deposition of fat in the human body. Like diabetes, obesity is considered an epidemic of the 21st century. According to the World Health Organization, since 1975, the number of obese people in the world has more than tripled. Already in 2016, more than 1.9 billion people on the planet over 18 years old were overweight, and over 650 million of them were obese. Today, almost every second inhabitant of the planet is obese 1 degree. It is considered that overweight is a condition in which a significant amount of fat and its ratio to muscle tissue accumulates in the body. Normally, the regulator of this ratio in the body is the correspondence between anabolism and catabolism, and if a person moves little, then a certain part of the nutrients consumed with food is converted into fat.

A particular health hazard in diabetes mellitus type I is abdominal (android) obesity. In the case of the android type of obesity, an increase in blood pressure occurs most often, shortness of breath with minimal exertion, the functioning of the digestive system and the menstrual cycle is disturbed. In itself, abdominal obesity is often the impetus for the development of diabetes, atherosclerosis and hypertension.

The appearance and progression of these diseases is directly related to the adverse effect of excess fat on the internal organs. Most of it accumulates in the subcutaneous tissue and on the abdominal organs (in the omentum, on the stomach and intestines). As a result, the work of these organs deteriorates.

It is customary to distinguish four degrees of obesity. The degree of this disease can be determined using special tables that help calculate the ideal body weight, taking into account the patient’s sex, height and age, as well as body mass index. Grade 1 obesity is diagnosed when the patient’s body weight is above normal by 20-29%. Grade 2 obesity is considered when the patient’s body weight exceeds the norm by 39-49%. Grade 3 obesity is a condition where body weight is 59-99% higher than ideal. With 4 degrees of obesity, the patient’s body weight exceeds the ideal mass by 100 percent or more. Previously, it was believed that this disease predominantly affects women, but according to statistics, both sexes are affected almost equally. It is clear that diabetes mellitus type I and abdominal obesity are very dangerous diseases of modern man. Their combination dramatically worsens the state of health and forms a very negative prognosis. Their presence closes the vicious circle - one pathology burdens another. Regular exercise
increases the sensitivity of insulin receptors and thereby reduces the level of glucose and lipids in the blood. This often allows patients to reduce the dose of insulin injected and significantly reduce body weight\textsuperscript{22}.

The most effective means of physical rehabilitation in the combination of diabetes mellitus and obesity is the muscular load of moderate intensity, which involves medium and large muscles with a significant number of repetitions. During such work, per unit of time, the body energy expenditure is small, however, due to the long exercise time, the total energy consumption is significant. Aerobic mode of work contributes to the adequate absorption of glucose from the blood and its complete combustion in the muscles with a decrease in the sugar content in the blood\textsuperscript{23}. In the introductory period of aerobic exercise, such patients should be advised to use walking and, if the patient’s condition permits, to run. It should be performed at such a pace that the pulse is kept within 110 - 140 per minute. It is not necessary to significantly increase the speed of running in such patients - it is dangerous. In this category of patients it is rational to gradually increase the load by increasing the duration of walking or running. The main criterion for the adequacy of the load performed should be considered patient well-being. We must strive to gradually bring the duration of training up to 40 - 60 minutes\textsuperscript{24}.

In addition to aerobic exercises with a combination of diabetes and obesity, gymnastic exercises should be used in combination with breathing exercises, which helps to activate fat burning and normalize their metabolism in the body. The specific selection of exercises and the mode of their implementation should be determined by the initial degree of fitness of the patient, his general condition, the available clinical picture and the severity of insulin deficiency\textsuperscript{25}.

Regular physical exercises stimulate protein metabolism, contributing to overall recovery, minimize the manifestations of the pathology of the gastrointestinal tract, musculoskeletal system, respiratory system, liver, reproductive system. As with taking medications, when applying physical activity, you must follow a number of simple rules. During the load, it is necessary to consume 1 XU (apple) every 30 minutes in order not to get hypoglycemia. With high-intensity training should reduce the dose of insulin by 20-50\%\textsuperscript{26}.

### Discussion

The great benefit of reduced muscle activity in patients with diabetes mellitus type I and obesity is associated with the mobilization of the utilization of carbohydrates and fats in the body against its background. The main consumer of glucose and lipids from the blood during work is brain tissue. A significant part of them also absorbs the heart muscle and skeletal muscle\textsuperscript{27}.

The relationship between carbohydrate and lipid metabolism depends on the intensity and duration of muscle activity. With short-term physical exertion, when predominantly anaerobic splitting of the glycogen of the muscles is observed, the accumulation of lactate inhibits lipolysis in adipose tissue and skeletal muscles, inhibiting harmoniously sensitive lipase. At the same time, prolonged physical exertion causes a decrease in the concentration of free fat in the blood and an increase in the blood flow to the working muscles leads to a decrease in their utilization during prolonged physical exertion, which is very physiologically beneficial for disorders of carbohydrate and fat metabolism\textsuperscript{28}.

Against the background of physical exertion, the glucose level in the blood of such patients is often normalized and then can be maintained for some time within the normal range. This occurs due to a decrease in the glycogen content in the muscles and the liver, which inevitably leads to a drop in the glucose concentration in the blood. At the same time, it is lipid sources that are important energy substrates for the metabolism of skeletal muscles when performing regular feasible physical exertion.

Mobilization and utilization of carbohydrate and lipid sources for energy supply of the contractile function of muscles during physical exertion is controlled by epinephrine, norepinephrine, insulin, cartosol. Their number in the course of regular muscle activity, even with obesity and diabetes mellitus, increases significantly. This hormonal response to physical work favors successful hepatic glycogenolysis, as well as lipolysis\textsuperscript{29}.

Prolonged physical activity in such patients at the level of 30\% of the maximum oxygen consumption is
accompanied by a significant contribution of free fatty acids of the blood plasma to its energy supply. At the same time, an increase in the intensity and a decrease in the duration of muscle activity leads to an increasing use of carbohydrates as the main energy sources.

**Conclusion**

The most frequent variant of the disturbance of carbohydrate metabolism in the modern world is diabetes mellitus type I. Of the diseases associated with lipid disorders, obesity is the most common on the planet. Their combination dramatically worsens the state of health and forms a very negative prognosis. The most effective means of physical rehabilitation in the combination of diabetes mellitus and obesity is the muscular load of moderate intensity, which involves medium and large muscles with a significant number of repetitions. During such work, per unit of time, the body energy expenditure is small, however, due to the long exercise time, the total energy consumption is significant. Aerobic mode of work contributes to the adequate absorption of glucose from the blood and its complete combustion in the muscles with a decrease in the sugar content in the blood. With mild and moderate disease, regular endurance training increases the overall effectiveness of treating diabetes and obesity, stabilizes blood glucose and body weight, resulting in a reduction (on average by 25%) the dose of insulin injected.

**Conflict of Interest:** No conflict of interest is declared.

**Sources of Funding:** The study was conducted at the expense of the authors.

**Ethical Clearance:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

**REFERENCES**


ABSTRACT

Currently, bronchial asthma is one of the most common diseases in childhood and adolescence, capable of consistently worsening the quality of life of patients, and in severe cases it leads to disability. Despite the fairly widespread prevalence of bronchial asthma in adolescents, the specifics of disorders in them in the external respiration system require clarification. For this reason, an additional examination of patients in this category was conducted. The aim of the work is to assess the impairment of the functional state of the respiratory system in adolescents suffering from bronchial asthma. The study involved 38 adolescents aged 13–14 years suffering from at least 5 years of moderate bronchial asthma without signs of respiratory failure. At the time of the examination, the disease in the examined adolescents was in a state of unstable remission. The control group consisted of 20 adolescents of the same age, clinically completely healthy. For adolescents with asthma is characterized by a decrease in lung capacity and bronchial diameter of any caliber. This inevitably leads even in adolescents suffering from at least 5 years of bronchial asthma, to a marked decrease in the functional capabilities of the respiratory apparatus. It became clear that early in this disease, resistance of the respiratory center to hypoxia and weakening of the adaptive capacity of the entire respiratory system occurs. In adolescents with bronchial asthma, all the identified disorders lead to an increase in the functional weakness of their respiratory and circulatory systems, and, consequently, they form a low resistance to hypoxia even at a young age.

Keywords: respiratory system, bronchi, lungs, bronchial asthma, adolescents.

Introduction

The course of ontogeny of any organism implies its continuous interaction with the environment, which does not always have a beneficial effect. All external influences on the organism cause in it sometimes a whole series of genetically determined reactions aimed at adapting to the current conditions of existence. Due to the severity of adverse environmental effects and the presence in some cases of imperfect adaptation mechanisms and responses in the body, various dysfunctions can occur, and sometimes pathological processes.

Observations show that the cardiovascular system, the blood system and the respiratory system are very vulnerable in the human body. Being life support systems, they largely support the overall viability of the mammalian organism. At the same time, in recent years there has been a marked increase in the number of various lung diseases, especially at young and young age.

Bronchial asthma is currently one of the most common diseases in childhood and adolescence, capable of consistently worsening the quality of life of patients and their families, and in severe pathology leading to disability. It is precisely established that bronchial asthma is a chronic disease of predominantly inflammatory and allergic etiology. It often develops against the background of a hereditary predisposition to allergic processes.

The total number of patients with bronchial asthma in the modern world is more than 150 million people. In
Russia now there are about 8 million people (about 9% among children and adolescents and about 5% among adults), and 1 million of them have a severe course of the disease. However, there is reason to believe that the true prevalence of bronchial asthma is several times higher, since it is officially registered only in 1 out of 4-5 patients.\(^{15}\)

Despite the fairly widespread prevalence of bronchial asthma in adolescents, the specifics of disorders in them in the external respiration system require clarification. For this reason, it was necessary to conduct additional examinations of patients in this category.

The purpose of the study is to assess the impairment of the functional state of the respiratory system in adolescents suffering from bronchial asthma.

**Materials and Research Method**

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11). The study was conducted on the basis of the Moscow Children’s City Polyclinic No. 38 and the Russian State Social University, Moscow, Russia. The study involved 38 adolescents aged 13–14 years suffering from at least 5 years of moderate bronchial asthma without signs of respiratory failure. At the time of the examination, the disease was in all adolescents in a state of unstable remission. The control group consisted of 20 adolescents of the same age, clinically completely healthy.

Studies were conducted on the spirograph SMP-21/01-“P-D” produced by the Scientific-Production Enterprise “Monitor” (Russia). According to the spirogram, a number of indicators were evaluated: minute respiratory volume, lung capacity, maximum lung ventilation, inspiratory reserve volume, expiratory reserve volume, forced vital capacity, forced expiratory volume in 1 second, peak volume rate, maximum volume rate at 25%, 50% and 75% of the forced vital capacity.

All examined were subjected to a functional test of the Post by determining the maximum possible breath-holding time after a deep breath. It was performed in all cases after resting in a sitting position. The subject took a full breath and then exhale, and then again inhale (80-90% of the maximum) and held his breath for the maximum time possible for him.\(^{16}\)

Also, all Genchi’s functional tests were carried out to all those taken under observation, determining the maximum possible breath-hold time on exhalation. After 3-5 minutes of rest in the sitting position, the patient was asked to take a full exhalation and inhale, and then exhale again and hold the breath.\(^{16}\)

For a holistic and objective assessment of the functional state of the cardiorespiratory system in the examined, the Skibinsky index was calculated. This indicator characterizes the overall functional state of the respiratory system and its resistance to hypoxia. The calculation of the Skibinsky index was carried out in the following way: vital capacity of the lungs/100 × barbell test, s/heart rate. The results obtained during the calculation were evaluated on the following scale: less than 5 - very bad; 5-10 - unsatisfactory; 10-30 - satisfactory; 30-60 - good; 60 or more - very good.

The size of the chest excursion was measured with a centimeter tape, which was applied to the back at the corners of the shoulder blades and in front over the mammary glands (in girls), then the difference between the maximum inhalation and exhalation was calculated.\(^{16}\)

The obtained results were processed by the methods of mathematical statistics using the statistical software packages Microsoft Excel.

**Research Results and Discussion**

In adolescents suffering from bronchial asthma, there was a significant violation of indicators of respiratory function (Table 1).

**Table 1: Indicators of respiratory function in adolescents with bronchial asthma**

<table>
<thead>
<tr>
<th>Estimated indicators</th>
<th>Group of sick teenagers, n = 38, M ± m</th>
<th>Group of control, n = 20, M ± m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung capacity, l</td>
<td>2.0 ± 0.09</td>
<td>2.4 ± 0.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Forced vital capacity, l</td>
<td>1.8 ± 0.08</td>
<td>2.3 ± 0.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Forced expiratory volume in 1 second, l</td>
<td>1.7 ± 0.11</td>
<td>2.2 ± 0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Minute respiratory volume, l/min</td>
<td>12.5 ± 0.38</td>
<td>10.1 ± 0.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Maximum ventilation, l/min</td>
<td>48.9 ± 0.43</td>
<td>57.9 ± 0.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p&lt;0.05</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Peak volumetric rate, l/s</th>
<th>2.6 ± 0.29</th>
<th>4.2 ± 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Maximum volume velocity of 25%, l/s</td>
<td>3.2 ± 0.26</td>
<td>4.3 ± 0.27</td>
</tr>
<tr>
<td>p&lt;0.05</td>
<td>p&lt;0.05</td>
<td></td>
</tr>
<tr>
<td>Maximum volume velocity of 50%, l/s</td>
<td>2.3 ± 0.28</td>
<td>3.0 ± 0.20</td>
</tr>
<tr>
<td>p&lt;0.05</td>
<td>p&lt;0.05</td>
<td></td>
</tr>
<tr>
<td>Maximum volume velocity of 75%, l/s</td>
<td>1.5 ± 0.11</td>
<td>1.8 ± 0.16</td>
</tr>
<tr>
<td>p&lt;0.05</td>
<td>p&lt;0.05</td>
<td></td>
</tr>
<tr>
<td>The result of the test Stange, s</td>
<td>42.3 ± 0.56</td>
<td>61.2 ± 0.48</td>
</tr>
<tr>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>The result of the test Gencha, s</td>
<td>25.5 ± 0.67</td>
<td>32.6 ± 0.42</td>
</tr>
<tr>
<td>p&lt;0.05</td>
<td>p&lt;0.05</td>
<td></td>
</tr>
<tr>
<td>Excursion of the chest, cm</td>
<td>2.9 ± 0.32</td>
<td>5.8 ± 0.39</td>
</tr>
<tr>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Skibinsky index, usl. units</td>
<td>26.6 ± 0.85</td>
<td>61.3 ± 0.71</td>
</tr>
<tr>
<td>p&lt;0.01</td>
<td>p&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

Legend: p-confidence of differences in performance between patients and the control group.

It was found that the values of lung capacity in adolescents with asthma were lower than the control group by 20.0%. The magnitude of the forced vital capacity of the lungs was below the control level by 27.0%. At the same time, in terms of the forced expiratory volume in 1 second, the control group exceeded the same indicator in sick adolescents by 29.4%.

When comparing the indices of the minute volume of respiration, it was possible to establish its increase in adolescents with asthma compared with the control group by 23.8%. In addition, in the group of patients, the maximum ventilation rate was reduced by 18.4%.

In the group of adolescents with asthma, the peak volume rate was reduced by 73.1%. This was accompanied by their reduction by 34.4% of the average value of the maximum volumetric flow rate at 25% of the value of the forced vital capacity of the lungs. Their maximum space velocity, at the level of 50% and 75% of the forced vital capacity, was reduced by 30.4% and 20.0%, respectively. In addition, in adolescents with bronchial asthma, the indices of hypoxic samples and the level of chest excursion were significantly lower than those in the control group. The average Skibinsky index in adolescent patients was significantly lower than in the control group (2.3 times).

Discussion

Currently, asthma in adolescents is a very common pathology. Often, it manifests itself already in childhood and progresses rapidly, sometimes leading to disability in young and mature age17,18.

It was shown that a significant decrease in lung capacity is characteristic of this group of patients19,20. In addition, they have an average indicator of forced vital capacity of the lungs also significantly inferior to the level of control. Increasing their bronchial obstruction inevitably leads to a decrease in the forced expiratory volume in 1 second. This was confirmed by the study. The authors found a decrease in the maximum ventilation index in adolescents with asthma21,22. These changes should be considered as evidence of the low functional capacity of the respiratory apparatus in adolescents suffering from bronchial asthma, as well as in their ability to mobilize reserves of respiratory function23,24,25.

A comparison of the indices of the minute volume of respiration in both groups of observations showed an increase in adolescents with bronchial asthma26,27. At the same time, the found decrease in peak volumetric rate in the group with bronchial asthma proved for them the presence of low functionality of the respiratory muscles and reduced patency of large-caliber bronchi. The reduced values of the maximal volumetric rate at 25% of the forced vital capacity of the lungs confirmed the development in adolescents with bronchial asthma and the progressive deterioration in patency at the level of the large bronchi28,29. The found decrease in bronchial asthma of the average values of the maximum volumetric rate at 50% and 75% of the forced vital capacity of the lungs also proved in patients with adolescents a decrease in the patency of their bronchi of medium and small caliber. Negative changes in their indices of hypoxic tests and a reduction in the volume of the chest excursion proved the possibility of developing already in adolescence with this pathology of a pronounced resistance of the respiratory center to hypoxia and weakening the adaptive capacity of the entire respiratory system30,31,32. The decrease in the Skibinsky index found in the observation group should be regarded as a manifestation of functional weakness of the respiratory and circulatory organs against the background of bronchial asthma, and, consequently, their body’s low resistance to any hypoxic conditions33,34,35.
Conclusion

Currently, asthma remains one of the most common diseases of the respiratory system. The presence in this pathology of changes in the sensitivity of the walls of the bronchi to external influences and the development of their hyperresponsiveness creates the basis for respiratory dysfunction. These disorders occur already in adolescence and sometimes manifest significant impaired respiratory function. These patients are characterized by a decrease in lung capacity and bronchial diameter of any caliber. Already in adolescents suffering from bronchial asthma, this leads to a marked decrease in the functional capabilities of the respiratory apparatus, as well as to a weakening of the ability to mobilize the reserves of the respiratory apparatus.

Conflict of Interest: No conflict of interest is declared.

Sources of Funding: The study was conducted at the expense of the authors.

Ethical Clearance: The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

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13. Zavalishina S. Yu. Physiological Features of Hemostasis in Newborn Calves Receiving Ferroglukin, Fosprenil and Hamavit, for Iron


Physical Rehabilitation of Adolescents with Bronchial Asthma

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1 Russian State Social University, St. V. Pika, 4, Moscow, Russia, 129226; 2 Samara State of Social and Pedagogical University, Russia, Samara, st. M. Gorky, 65/67, 443099; 3 Moscow State University of Psychology and Education, Moscow, st. Stretenka, 29, 127051

ABSTRACT

The aim of the work is to assess the impairment of the functional state of the respiratory system in adolescents suffering from bronchial asthma. The study involved 38 adolescents aged 13–14 years suffering from at least 5 years of moderate bronchial asthma without signs of respiratory failure. At the time of the examination, the disease in the examined adolescents was in a state of unstable remission. The control group consisted of 20 adolescents of the same age, clinically completely healthy. For adolescents with asthma is characterized by a decrease in lung capacity and bronchial diameter of any caliber. This inevitably leads even in adolescents suffering from at least 5 years of bronchial asthma, to a marked decrease in the functional capabilities of the respiratory apparatus. It became clear that early in this disease, resistance of the respiratory center to hypoxia and weakening of the adaptive capacity of the entire respiratory system occurs. In adolescents with bronchial asthma, all the identified disorders lead to an increase in the functional weakness of their respiratory and circulatory systems, and, consequently, they form a low resistance to hypoxia even at a young age.

Keywords: rehabilitation, respiratory system, lungs, bronchial asthma, adolescents.

Introduction

The individual development of a living organism is associated with its constant interaction with the environment, which often has an adverse effect on it. All effects on the organism from the environment form in it a whole series of regular reactions aimed at adaptation to the existing conditions of life activity. Due to the severity of adverse environmental effects and, in some cases, imperfect adaptation reactions in the body, various dysfunctions sometimes develop, and sometimes obvious pathology.

The cardiovascular system, the blood system and the respiratory system are highly susceptible to pathological processes in the human body. They are life support systems and, as a result, largely support the overall viability of the mammalian organism. However, it is in them that the appearance of various pathologies is realized. At the same time, there is an increase in lung diseases, especially at an early age. One of these diseases is bronchial asthma. Currently, it is one of the most common diseases in adolescence, which greatly deteriorates the quality of life and often leads to disability.

The number of patients with bronchial asthma in the world reaches 150 million. In Russia now there are about 8 million people (about 9% among children and adolescents and about 5% among adults), and 1 million of them have a severe course of the disease. There is reason to believe that the true prevalence of bronchial asthma is several times higher, since it is officially registered only in 1 out of 4-5 patients.

The prevalence of asthma and its sometimes severe course is currently creating an urgent need to improve the approaches to the rehabilitation of this cohort of patients, using a wide range of health effects.

To date, developed many methods of medical treatment of bronchial asthma. However, their frequent and long-term use has a number of side effects and does not provide in all cases stabilization of the patient’s
Especially not studied modern medicine the possibility of exercise based on the elements of yoga.

The purpose of the study is to assess the rehabilitation capabilities of the asanas complex in terms of correction of the functional state of the respiratory system in adolescents suffering from bronchial asthma.

**Materials and Research Method**

The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11). The study was conducted on 38 adolescents aged 13-14 years suffering from at least 5 years of moderate bronchial asthma without signs of respiratory failure. At the time of the first survey, the disease was in all adolescents in a state of unstable remission. The control group consisted of 20 adolescents of the same age, clinically completely healthy.

All adolescents with asthma underwent physical rehabilitation for 3 months according to the scheme below. The applied rehabilitation included the daily performance of the following asanas, developed and tested by thousands of years of practice of Indian medicine:

1. Asana “Cobra”. Starting position - lie down on your stomach, with your palms on both sides of your chest, bending your elbows. Legs straight, pulled together, socks stretched. During inhalation, leaning on the arms, gently lift the upper half of the body and head upwards, and deflect them as far back as possible. Asana is performed 8-10 times per exercise.

2. Asana “Locust”. Starting position - lie on the stomach so that the chin touches the floor. Hands lie along the body, fingers clenched into fists, socks stretched. Inhale deeply and simultaneously raise your right leg as high as possible. When holding your breath while inhaling, keep your leg as high as possible and then lower your leg to the starting position. Asana is performed 8-10 times.

3. Asana “Bow”. Starting position - lie on your stomach, lift your legs bent at the knees, hold your ankles with your hands. Inhale deeply and pull both legs up, bending the back. Stay in that position, hold your breath, then as you exhale, slowly lower your legs. Asana is repeated 10-12 times.

4. Asana “Folding knife”. Starting position - lie on your back, stretch your legs. Inhale deeply and as you exhale, raise the bent right leg. With both hands, press the knee firmly against the stomach, holding the breath. Put your hands on the sides of the torso. Extend the leg and as you exhale slowly lower it to its original position. Make a similar movement with the other leg, and then with both feet together. Asana is repeated 8-10 times.

5. Asana “Birch”. Starting position - lying on your back, arms along the body, palms down. With an exhalation, bend the legs at the knees and pull them up to the stomach. Then, rest your hands on your back, lift the torso vertically upwards. Asana is repeated 8-10 times.

6. Asana “Cleansing Breath”. Starting position - standing. After the maximum exhalation, inhale through the nose, as with full breathing. After that, immediately begin to exhale through the mouth: press the lips tightly to the teeth, leave only a narrow gap between them, through which to produce a forced exhalation with several pushes, to strain the abdominal muscles and intercostal muscles. Asana perform 6-8 times.

7. Asana “Blacksmith”. Starting position - sitting in the lotus position. After a full exhalation, quickly inhale and exhale through the nose - 10 times, then exhale, hold the breath for 7-10 seconds, inhale, followed by a breath hold for 10-15 seconds. Gradually bring the number of breaths in one cycle to 25-30. Asana is repeated 5 times.

The study used the spiograph SMP-21/01-“P-D” produced by the Scientific-Production Enterprise “Monitor” (Russia). With it, a spirogram was recorded, which was used to evaluate the minute respiration volume, lung capacity, maximum lung ventilation, inspiratory reserve volume, expiratory reserve volume, forced lung capacity, forced expiratory volume in 1 second, peak volume velocity, maximum volume velocity at the level 25%, 50% and 75% of the value of the forced vital capacity of the lungs.

In the work, all the examined were subjected to a functional Stanbe test by determining the maximum possible breath-holding time after a deep breath. It was performed in all cases after resting in a sitting position.
All taken under the supervision of a functional test performed Genchi, determining the maximum possible breath-hold time on the exhale\textsuperscript{18}.

For a complete and objective assessment of the functional state of the cardiorespiratory system in the subjects, the Skibinsky index was calculated.

The activity of the chest excursion was measured using a measuring tape, which was applied to the back at the corners of the shoulder blades and in front over the mammary glands (in girls), then the difference between the maximum inhalation and exhalation was calculated\textsuperscript{18}.

The results of the study were processed by the methods of mathematical statistics using the statistical software packages Microsoft Excel.

**Research Results and Discussion**

In adolescents suffering from bronchial asthma, there was a significant violation of indicators of respiratory function (Table 1).

<table>
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<td></td>
<td>at the beginning of the observation</td>
<td>at the end of the observation</td>
</tr>
<tr>
<td>Lung capacity, l</td>
<td>2.0 ± 0.09</td>
<td>2.3 ± 0.18, (p &lt; 0.05)</td>
</tr>
<tr>
<td>Forced vital capacity, l</td>
<td>1.8 ± 0.08</td>
<td>2.2 ± 0.10, (p &lt; 0.01)</td>
</tr>
<tr>
<td>Forced expiratory volume in 1 second, l</td>
<td>1.7 ± 0.11</td>
<td>2.21 ± 0.17, (p &lt; 0.01)</td>
</tr>
<tr>
<td>Minute respiratory volume, l/min</td>
<td>12.5 ± 0.38</td>
<td>10.7 ± 0.26, (p &lt; 0.05)</td>
</tr>
<tr>
<td>Maximum ventilation, l/min</td>
<td>48.9 ± 0.43</td>
<td>56.2 ± 0.58, (p &lt; 0.05)</td>
</tr>
<tr>
<td>Peak volumetric rate, l/s</td>
<td>2.6 ± 0.29</td>
<td>4.0 ± 0.43, (p &lt; 0.01)</td>
</tr>
<tr>
<td>Maximum volume velocity of (v_{st}), l/s</td>
<td>3.2 ± 0.26</td>
<td>4.1 ± 0.31, (p &lt; 0.05)</td>
</tr>
<tr>
<td>Maximum volume velocity of (v_{50}), l/s</td>
<td>2.3 ± 0.28</td>
<td>2.9 ± 0.26, (p &lt; 0.05)</td>
</tr>
<tr>
<td>Maximum volume velocity of (v_{75}), l/s</td>
<td>1.5 ± 0.11</td>
<td>1.7 ± 0.18, (p &lt; 0.05)</td>
</tr>
<tr>
<td>The result of the test Stange, s</td>
<td>42.3 ± 0.56</td>
<td>59.8 ± 0.24, (p &lt; 0.01)</td>
</tr>
<tr>
<td>The result of the test Gencha, s</td>
<td>25.5 ± 1.67</td>
<td>31.1 ± 0.38, (p &lt; 0.05)</td>
</tr>
<tr>
<td>Excursion of the chest, cm</td>
<td>2.9 ± 0.32</td>
<td>5.6 ± 0.45, (p &lt; 0.01)</td>
</tr>
<tr>
<td>Skibinsky index, usl. units</td>
<td>26.6 ± 0.85</td>
<td>59.6 ± 0.67, (p &lt; 0.01)</td>
</tr>
</tbody>
</table>

**Legend:** \(p\) - reliability of differences in indicators between patients and the control group, \(p_1\) - reliability of the dynamics of indicators against the background of rehabilitation.

As a result of rehabilitation activities carried out for 3 months in adolescents with asthma, an increase in lung capacity was achieved to the level of the control group (by 15.0%). At the same time, the value of the forced vital capacity of the lungs in them also reached the level of control, having increased by 22.2%. By the end of the observation, in terms of the forced expiratory volume in 1 second, the control group was equal to the same indicator in adolescent patients due to its growth by 23.5%.

During physical rehabilitation in adolescents with bronchial asthma, normalization of the minute volume of respiration was achieved due to its decrease by 46.8% and the maximum ventilation rate as a result of its increase by 14.9%.

Rehabilitation of adolescents with asthma provided an increase in peak volume rate of 53.8%. In these adolescents, by the end of the observation, the maximum volumetric rate, which is at 50% and 75% of the forced vital capacity, increased by 26.1% and 13.3%, respectively. In addition, in adolescents with asthma against the background of the rehabilitation, the indices of hypoxic samples and the level of the chest excursion increased significantly and approached those in the control group. At the same time, the average value of the Skibinsky index in adolescent patients increased significantly and by the end of the observation corresponded to the level of the control group.
Discusson

In the modern world, asthma is a very common pathology in adolescents. Often it manifests itself already in childhood and progresses very quickly\(^{19,20,21}\).

It was found that the applied asan complex provided in adolescent patients an increase to the level of the lung capacity\(^{22,23}\). In addition, they managed to significantly increase their average forced vital capacity\(^{24,25}\).

Rehabilitation provided adolescents with a decrease in the minute volume of respiration, which was accompanied by an increase in peak volume velocity, proving the development of an increase in the functionality of the respiratory muscles and optimization of the large-caliber bronchi\(^{26,27}\). The found changes on the background of the rehabilitation of the maximum volumetric rate indicator at the level of 25% of the forced vital capacity of the lungs indicated a significant increase in the patency of the large bronchi in the treated adolescents\(^{28}\). Achieved during the rehabilitation of adolescents with bronchial asthma, the growth of average values of the maximum volumetric rate at 50% and 75% of the forced vital capacity of the lungs proved the optimization of the passability of the bronchi of medium and small caliber in them\(^{29}\). Positive changes in them during the rehabilitation of the indices of hypoxic samples and the volume of the chest excursion proved the possibility of normalization in adolescence with this pathology of the sensitivity of the respiratory center to hypoxia and the adaptive capacity of the entire respiratory system.

Conclusion

The development of asthma changes the sensitivity of the walls of the bronchi to external influences and leads to their hyperresponsiveness. Early in this disease, resistance of the respiratory center to hypoxia and weakening of the adaptive capacity of the entire respiratory system occurs. This leads to an increase in the functional weakness of the respiratory system and circulatory system, forming a low resistance of the young organism to hypoxia. The system of asanas, tested in adolescents with asthma, helped to gradually eliminate disturbances in the system of external respiration, establishing a normal relationship between the cerebral cortex and internal organs.

**Conflict of Interest:** No conflict of interest is declared.

**Source of Funding:** The study was conducted at the expense of the authors.

**Ethical Clearance:** The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

**REFERENCES**


ABSTRACT

The Aim: to evaluate the developmental changes in the hemostatic properties of platelets in outbred rats aged between 3 and 24 months of ontogenesis.

Materials and Method: The study included 156 outbred healthy male rats, including 28 heads at 3 months of age, 31 rats aged 6 months, 33 heads aged 12 months, 34 animals aged 18 months and 30 rats aged 24 months. Used biochemical, hematological and statistical research methods.

Results: The amount of lipid peroxidation products in rat platelets remained stably normal for up to 12 months, subsequently progressively increasing until the end of observation. This was due to the change in their physiological properties of catalase and platelet superoxide dismutase. Their activity in rats remained stably large until 12 months, and subsequently gradually decreased until the end of the observation. The found changes were accompanied in rats by an increase in the platelets of self-assembly of the actin-myosin complex, as well as the level of content in them and the degree of secretion from them of the ADP and ATP molecules after 12 months of age. In animals older than 1 year, an increase in the ability of platelets to aggregate was observed, which indicated an increase in their primary hemostasis.

Conclusions: The found gradual increase in the level of platelet activity in rats during the second year of their life indicates an increase with age of expression of fibrinogen receptor on the surface of platelets to various inducers of platelet aggregation and an increase in the activity of intra-platelet hemostatic processes.

Keywords: ontogenesis, rats, platelets, aggregation, secretion, lipid peroxidation.

Introduction

Recently, the greater physiological significance of platelet activity in providing the necessary adaptive manifestations of the body has become increasingly clear. It has been found that platelets have a serious regulatory role in ensuring the optimum microcirculation, which are required for the development and maximum realization in the phenotype of all genetically determined traits. They are very sensitive to all impacts from the external environment can be activated in response to a large number of environmental factors of different nature. As a result of changes in the ability of the aggregation process, platelets regulate hemocirculation processes and, thus, trophism of tissues.

For the successful implementation of many studies, it is of great scientific and practical interest to determine the ontogenetic changes in the hemostatic properties of platelets, which are very important during the process of thrombus formation. This information is very relevant for successful research in various models of cardiovascular disorders.

It has been observed that during an increase in chronological age, platelet activity in a person changes. For this reason, the assessment of the age dynamics of platelet functions throughout ontogenesis in rats, which are very often used in laboratory animals in studies, is very relevant. This information can be very useful for an experimental search for corrective effects on platelet function at different ages and in many pathological
processes\textsuperscript{15,16}, which are very common in humans. In this regard, the purpose of this study was to assess the developmental changes in the hemostatic properties of platelets in outbred rats aged between 3 and 24 months of ontogenesis.

**Materials and Research Method**

This study was carried out in full compliance with the norms of ethics defined by the European Convention for the Protection of Vertebrate Animals used for experimental and other scientific purposes (adopted in Strasbourg on 03.18.1986 and confirmed in Strasbourg on 15.06.2006). The study took outbred healthy male rats (n = 156), which were obtained at the age of 2 months from the nursery of laboratory animals of the Branch of the Institute of Bioorganic Chemistry (Moscow Region, Pushchino). The rats stayed in the quarantine zone for 14 days, and subsequently were kept in standard vivarium conditions in fairly spacious cages (the surface area of the bottom of the cage per 1 rat was 200 cm\(^2\)). In one cage were placed no more than 8 animals. Replacement of cells was carried out 2 times during the week. Before placing the animals in them, the cells were disinfected. Dry litter was located in the cells, having a thickness of 5-10 mm (sawdust, dry peat, wood chips), previously autoclaved at a temperature of 150-180°C. In all cells, the litter was replaced once a day. Natural lighting was used, the temperature was maintained at 18-22°C, relative humidity was maintained at 50-65\%, the level of ammonia in the air was not more than 0.01 mg/l, the amount of carbon dioxide in the air by volume was not more than 0.15\%, the multiplicity indicator air exchange (volumes per hour) was 8 by exhaust, 10 by inflow. Before being included in the study, rats did not participate in other experiments. All animals received high-grade compound feed intended for laboratory animals (produced by Laboratorykorm, Moscow) of brand PK-120. In rats, water was available in unlimited access.

Blood from rats was taken from the tail vein once, including 28 heads at 3 months of age, 31 rats aged 6 months, 33 heads aged 12 months, 34 animals aged 18 months and 30 rats age 24 months.

In rats, the general state and results of biochemical and hematological blood parameters were determined. Blood plates were obtained from them during washing and resuspension for further evaluation of the amount of malondialdehyde (MDA) in them, using the reduction reaction of thioarbituric acid and recording the amount of acylhydroperoxides (AHP)\textsuperscript{17}. The activity of intrathrombocyte enzymes with the antioxidant activity of catalase and superoxide dismutase (SOD) has been elucidated\textsuperscript{18}. The levels of adenosine triphosphate (ATP) and adenosine diphosphate (ADP), the activity of their secretion in response to the action of collagen, were also determined in platelets. The composition of the protein platelet cytoskeleton consisting of actin and myosin was determined in the case of activation and in the case of platelet aggregation in response to ADP and thrombin\textsuperscript{19}. The number of platelets in the blood was detected using the camera Goryaeva. The expression of platelet aggregation (AP) was detected by standard micromethod\textsuperscript{20}, using a number of agonists: ADP (0.5 (10\(^{-4}\) M), collagen (dilution 1: 2 of the main suspension), ristomycin (0.8 mg/ml), H\(_2\)O\(_2\) (7.3×10\(^{-3}\) M), thrombin (0.125 units/ml), adrenaline (5×10\(^{-6}\) M). The state of intravascular platelet activity (IPA) was assessed by microscopy using a phase-contrast nozzle\textsuperscript{21}. The obtained digital results were processed by the Student’s criterion, using the program StatSoft STATISTICA for Windows 6.0.

**Research Results and Discussion**

The overall functional status of the rats in all their observation groups was normal. The parameters of platelets in rats during ontogenesis were stable between 3 and 12 months of their life. The number of AGP in their platelets at the age of 3 months it turned out to be 2.38 ± 0.15 D\(_{235}\)/10\(^9\) platelets, not changing up to 12 months 2.40 ± 0.12 D\(_{235}\)/10\(^9\) platelets and increasing by 18 months to a level of 2.66 ± 0.19 D\(_{235}\)/10\(^9\) platelets and then increasing by the 24 months to 2.86 ± 0.29 D\(_{235}\)/10\(^9\) platelets. The MDA level in platelets in rats aged 3 months was 0.68 ± 0.11 mmol/10\(^9\) platelets, remaining unchanged for up to 12 months of life (0.70 ± 0.09 mmol/10\(^9\) platelets), rising to 18 months to 0.87 ± 0.18 mmol/10\(^9\) platelets and by 24 months to 0.95 ± 0.14 mmol/10\(^9\) platelets. The physiological properties of catalase and SOD of platelets in rats were stable up to 12 months (9920.0 ± 14.07 IU/10\(^9\) platelets and 1860.2 ± 17.06 IU/10\(^9\) platelets), and subsequently decreased and reached in 24 month-old rats 8610.0 ± 12.07 IU/10\(^9\) platelets and 1640.0 ± 3.52 IU/10\(^9\) platelets, respectively. The found dynamics of peroxidation processes during ontogenesis in rats significantly ensured the features of functional mechanisms involved in platelet hemostasis.
found in them, including the course of self-assembly of the actin-myosin complex, as well as the presence of ADP and ATP molecules in platelets. Thus, over the course of the observation, the amounts of ATP and ADP in the animal platelets \((5.56 \pm 0.18 \mu\text{mol/10}^9 \text{ platelets and } 3.32 \pm 0.10 \mu\text{mol/10}^9 \text{ platelets})\) persistently increased to 12 months gradually increasing, reaching at the age of 24 months to \(5.88 \pm 0.26 \mu\text{mol/10}^9 \text{ platelets and } 3.82 \pm 0.23 \mu\text{mol/10}^9 \text{ platelets},\) respectively. The activity of secretion from platelets of rats ATP and ADP under the action of collagen with increasing age increased in total by 13.4% and 14.2%, respectively.

The content of actin in the platelets of rats between the ages of 3 and 12 months turned out to be fairly stable and small, but increased at an older age, reaching by 2 years \(39.8 \pm 0.20\%\) of the total protein in the platelet. The level of additional assembly of actin in rats against the background of platelet activation by a strong or weak inducer and during platelet aggregation also increased after 12 months of ontogenesis. A similar pattern of activity in animal platelets was also found for myosin. It was revealed that in the discoid blood plates of one-year-old rats, the content of myosin was \(16.3 \pm 0.22\%\) of the total amount of protein in the platelet. In older rats, this indicator was higher and reached 24.4 months of life \(18.4 \pm 0.23\%\). In the case of activation and development of platelet aggregation, either by strong or weak inducers in rats older than 12 months, the degree of additional myosin self-assembly gradually increased (table).

**Table: Platelet characteristics in rats in ontogenesis**

<table>
<thead>
<tr>
<th>Logged Parameters</th>
<th>Age of rats (M ± m), n = 156</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 month, n = 28</td>
</tr>
<tr>
<td><strong>Actin aggregation mechanism</strong></td>
<td></td>
</tr>
<tr>
<td>intact,% of total protein content</td>
<td>31.8 ± 0.10</td>
</tr>
<tr>
<td>against the background of ADP activation,% of the total protein content</td>
<td>36.2 ± 0.14</td>
</tr>
<tr>
<td>on the background of ADP aggregation,% of the total protein content</td>
<td>41.8 ± 0.16</td>
</tr>
<tr>
<td>against the background of thrombin activation,% of the total protein content</td>
<td>37.2 ± 0.14</td>
</tr>
<tr>
<td>against the background of thrombin aggregation,% of the total protein content</td>
<td>39.1 ± 0.16</td>
</tr>
<tr>
<td><strong>Myosin aggregation mechanism</strong></td>
<td></td>
</tr>
<tr>
<td>intact,% of total protein content</td>
<td>14.6 ± 0.13</td>
</tr>
<tr>
<td>against the background of ADP activation,% of the total protein content</td>
<td>19.6 ± 0.16</td>
</tr>
<tr>
<td>on the background of ADP aggregation,% of the total protein content</td>
<td>27.2 ± 0.12</td>
</tr>
<tr>
<td>against the background of thrombin activation,% of the total protein content</td>
<td>34.2 ± 0.15</td>
</tr>
<tr>
<td>against the background of thrombin aggregation,% of the total protein content</td>
<td>43.3 ± 0.12</td>
</tr>
</tbody>
</table>
Aggregation in vitro

<table>
<thead>
<tr>
<th></th>
<th>ADP, s</th>
<th>Collagen, s</th>
<th>Thrombin, s</th>
<th>Ristomycin, s</th>
<th>H$_2$O$_2$, s</th>
<th>Adrenalin, s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40.2 ± 0.12</td>
<td>32.9 ± 0.18</td>
<td>55.0 ± 0.09</td>
<td>48.5 ± 0.17</td>
<td>44.4 ± 0.13</td>
<td>100.3 ± 0.18</td>
</tr>
<tr>
<td></td>
<td>39.8 ± 0.08</td>
<td>33.2 ± 0.14</td>
<td>54.7 ± 0.11</td>
<td>47.8 ± 0.20</td>
<td>43.5 ± 0.09</td>
<td>99.3 ± 0.24</td>
</tr>
<tr>
<td></td>
<td>39.6 ± 0.11</td>
<td>32.7 ± 0.15</td>
<td>54.2 ± 0.18</td>
<td>47.1 ± 0.14</td>
<td>42.7 ± 0.15</td>
<td>98.4 ± 0.27</td>
</tr>
<tr>
<td></td>
<td>38.1 ± 0.18</td>
<td>32.1 ± 0.10</td>
<td>53.2 ± 0.16</td>
<td>46.3 ± 0.07</td>
<td>42.3 ± 0.12</td>
<td>97.8 ± 0.10</td>
</tr>
<tr>
<td></td>
<td>35.2 ± 0.12</td>
<td>29.8 ± 0.10</td>
<td>49.0 ± 0.11</td>
<td>43.4 ± 0.18</td>
<td>38.7 ± 0.09</td>
<td>89.9 ± 0.19</td>
</tr>
</tbody>
</table>

Platelet count in aggregates, %

|                         | 4.3 ± 0.07 | 4.5 ± 0.06 | 4.6 ± 0.10 | 4.7 ± 0.08* | 5.8 ± 0.05** |

The number of small units of 2-3 platelets per 100 free platelets

|                         | 3.0 ± 0.05 | 3.2 ± 0.08 | 3.3 ± 0.06 | 3.5 ± 0.07* | 5.5 ± 0.08** |

The number of medium and large units of 4 or more platelets per 100 free-lying platelets

|                         | 0.10 ± 0.008 | 0.11 ± 0.003 | 0.12 ± 0.007 | 0.14 ± 0.002* | 0.35 ± 0.004** |

Note: * – p<0.05, ** – p<0.01 accuracy of the dynamics of the indicators taken into account compared with the outcome.

In the examined rats, already from 12 months, a gradual decrease in the period of occurrence of antibodies was found in response to all inductors used (table). The earliest AP was collagen, occurring in 24 month-old rats for 29.8 ± 0.10 s. Underwent a comparable age dynamics of AP activity in response to ADP and ristomycin occurred in the examined rats a little later. Later, AP developed under the action of H$_2$O$_2$, thrombin and adrenaline, the time of its occurrence with which also decreased in rats older than a year. The marked acceleration of AP in the observed animals agreed with the established fact of IPA enhancement. The found parameters of antibodies with individual inductors made it possible to find out in rats over the age of 1 year the increase in the ability to aggregate their blood platelets. Acceleration of the onset of platelet aggregation in response to strong aggregation inducers (collagen and thrombin) indicated the activation of the enzyme phospholipase C, which implements the phosphoinositol pathway of platelet activation. This happened when the level of diacylglycerol and protein kinase C increased in platelets and with the simultaneous intensification of the assembly of actin and myosin macromolecules in them. Acceleration of AP in response to weak inducers of aggregation, including ADP, indicated an increase in the availability of receptors to it on the platelet surface and at the same time an increase in the expression of fibrinogen receptors, as well as an increase in the activity of phospholipase A$_2$, which releases arachidonic acid from the phospholipids of blood plasmid membranes further synthesis of thromboxane A$_2$. In the blood of rats in the first year of life, the number of small and large platelet aggregates circulating in the blood was also stable and subsequently increased from 3.3 ± 0.06 and 0.12 ± 0.007 per 100 free-lying platelets at the age of 12 months to 5.5 ± 0.08 and 0.35 ± 0.004 per 100 free platelets at 24 months of ontogenesis. The number of platelets involved in the aggregates in rats between 12 and 24 months increased by 34.9%. The established increase in IPA in rats during the second year of their life indicated an increase in the density of receptor on their platelet membranes, which can interact with fibrin and physiological inducers of platelet aggregation while enhancing the functioning of intraplatelet mechanisms for implementing their hemostatic processes.

Conclusion

At the age of 12 months in rats, there is a consistently low platelet aggregation. Subsequently, before the age of 2 years, they have a significant increase in it, manifested by an increase in the number of activated platelets in their blood and their freely moving aggregates. The found gradual increase in the level of platelet activity in rats during the second year of their life indicates an increase with age of the expression level on their surface fibrinogen receptors to various inducers of platelet aggregation against the background of the activation of intra-platelet hemostatic mechanisms.

Conflict of Interest: No conflict of interest is declared.
Source of Funding: The study was conducted at the expense of the authors.

Ethical Clearance: The study was approved by the local ethics committee of the Russian State Social University on September 15, 2017 (protocol №11).

REFERENCES
Behavior of Mothers of Children Aged 4-6 Years in Accessing Dental and Mouth Health Information

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¹Department of Dental Public Health, ²Graduate Student of Dental Health Science, Faculty of Dental Medicine, Universitas Airlangga

ABSTRACT

Introduction: One of the main infectious diseases in pre-school children (4-6 years) is Early Childhood Caries (ECC). Parents, especially mothers, play a central role in encouraging children to have good and sustainable habits in maintaining the health of their teeth and mouth. In this era, parents get to know a lot of informations about dental health through the internet.

Objective: This study aimed to analyze the behavior of mothers of pre-school age (4-6 years) children in accessing dental and oral health information.

Method: The population of this study were mothers and children from 10 preschool in the Mojo Health Center area, Surabaya. 228 pairs of mothers and children in kindergarten were selected by simple random sampling as respondents. Data collected by conducting intra oral examination in children with def-t index and questionnaire.

Results: Probability values (P-value) and Prevalence Ratio were obtained using Chi-square Test with categories of intention, attitude, subjective norms, and behavioral control that were perceived towards the behavior of mothers accessing dental and oral health information. The intention, attitude, subjective norms, and perceived behavioral control significantly influenced the behavior of mothers accessing dental and oral health information (P-value <0.05).

Conclusion: The behavior of mothers in accessing dental and oral health information is influenced by intentions, attitudes, subjective norms, perceived behavioral control. However, mother’s intention is only influenced by subjective attitudes and norms.

Keywords: dental caries, health behavior, information seeking behavior, internet access

Introduction

Oral and dental health of pre-school age children highly influences the health of the teeth and mouth when they are adult. Pre-school age children have not been able to think critically about information so that their behavior is based on the behavior of people they consider important. Children will imitate parents as the person closest to them. Therefore, parents have a central role in encouraging children to have good and sustainable habits to maintain dental and oral health¹.

A person’s behavior is based on three aspects, i.e. knowledge, attitudes, and actions². Of the three, the knowledge aspect becomes the most important one as the basis for the formation of behavior. Therefore, a poor knowledge of a mother about dental and oral health can be reflected in her behavior which will be imitated by her child. This shows that maternal knowledge is closely related to children’s behavior.

One of the main infectious diseases in pre-school children is dental caries (early childhood caries). The caries prevalence of pre-school age children in Surabaya in 2017 was high, which was 67.5% with a high degree of severity (def: 7.0)³. This is also based on the mother’s knowledge of the pre-school child respondents surveyed as low (49.1%)⁴.
In preventing dental caries problems in Surabaya, health centers are the leading agents for conducting preventative efforts through health education and promotion to reduce the high rates of dental caries in pre-school age children. Mojo Health Center is a health center in the Surabaya area that houses three villages, i.e. Mojo, Gubeng, and Airlangga sub-districts with a total number of children aged 1-4 as many as 4798 in 2017. Based on preliminary research conducted on 72 children aged 4-6 years in the working area of Mojo Health Center, the prevalence of dental caries obtained reached 87.5% with high severity (def: 6.7).

Based on the description above, it is necessary to examine the level of knowledge of mothers on dental and oral health as well as the behavior of accessing information, in order to obtain a clear and specific picture of the causes of high rates of caries in pre-school children in Mojo Health Center working area.

**Subjects and Method**

This study used observational analytical method with cross sectional approach to the relationship of maternal behavior in kindergarten children in accessing dental and oral health information for preschool children aged 4-6 years in the Mojo Surabaya Health Center area, aiming to analyze the behavior of mothers in accessing dental and oral health information. The sampling technique used was cluster sampling.

Respondents of this study were 228 pairs of mothers and children from 10 kindergartens in the Mojo Health Center area, Surabaya, i.e. Nabawi Islamic Preschool, Fajar Jaya Preschool, Candra Negara Preschool, Hapsari Preschool, Anak Ceria Preschool, Aisyiyah Preschool, PKK V Preschool, Bina Prestasi Preschool, Putra Airlangga Preschool, and Dian Surabaya Preschool.

Mothers as respondents were asked to fill out questionnaires in the form of questions that could provide an overview of the characteristics of parents, parents’ knowledge of dental and oral health, intentions, attitudes, subjective norms, and behavioral controls perceived by mothers towards the behavior of mothers accessing dental and oral health information. In the respondents of children, dental caries examination using WHO was carried out.

The data obtained were processed and cross tabulated using IBM SPSS 20 applications. Correlation between intention, attitude, behavior control perceived by the behavior of mothers accessing dental and oral health information was analyzed using cross tabulation.

**Findings**

The total sample was 228 pairs of mothers and children. However, researchers spread 500 questionnaires and received answers from respondents of 253 questionnaires. Based on this, the calculation was done with a total of 253 results of the questionnaire.

In this study, 86.6% of the respondents had good intentions to access dental and oral health information. This was also reflected in most attitudes (93.7%), subjective norms (69.3%), and perceived behavioral control (96.1%) towards the behavior of mothers in accessing dental and oral health information. The four categories also showed a significant P-value (ρ < 0.05). It means that intentions, attitudes, subjective norms, and perceived control affected the behavior of mothers in accessing dental and oral health information. Whereas, mothers’ knowledge of dental and oral health showed poor results (72.7%) with non-significant P-values (p>0.05).

The mothers’ belief regarding accessing dental and oral health information was good to do showed good results. It can be seen from the behavioral belief value of 93.7%, normative belief of 92.1%, and belief control of 94.1% with a significant P-value (p<0.05). However, the high prevalence of caries (84.7%) and caries severity (def: 6.9) were not in harmony with the results obtained by the researchers.

Table 1 shows that the incidence of poor intentions in mothers with poor attitudes is 100%, while for mothers with a good attitude is 0%. It was found that attitudes were significant (ρ <0.05) on the intention of mothers to access dental and oral health information. Then, poor intention for mothers with poor subjective norm was 15.6% while that in mothers with good subjective norms was 2.3%. It was found that subjective norm was significant (ρ<0.05) with the intention of mothers to access dental and oral health information.
Table 1: Cross tabulation of attitudes, subjective norms, and perceived control of the intention of mothers to access dental and oral health information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category of Intention</th>
<th>Total</th>
<th>P value</th>
<th>Prevalence ratio (PR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>Poor</td>
<td>16 (100%)</td>
<td>0 (0%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>0 (0%)</td>
<td>237 (86.2%)</td>
<td>237 (100%)</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>Poor</td>
<td>12 (15.6%)</td>
<td>65 (84.4%)</td>
<td>77 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>4 (2.3%)</td>
<td>172 (97.7%)</td>
<td>176 (100%)</td>
</tr>
<tr>
<td>Perceived behavior</td>
<td>Poor</td>
<td>2 (25%)</td>
<td>6 (75%)</td>
<td>8 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>14 (5.7%)</td>
<td>231 (94.3%)</td>
<td>245 (100%)</td>
</tr>
</tbody>
</table>

The probability value (P-value) and Prevalence Ratio were obtained using Chi-square tests with the category of mothers’ age variables on the knowledge of mothers accessing dental and oral health information. From Table 2, it can be seen that poor knowledge at the age of <35 years old mothers was 69.8%, while at mothers aged ≥ 35 years was 75.8%. Mothers’ age was not significant (p = 0.28) to the knowledge of mothers in accessing dental and oral health information.

Table 2: Cross tabulation of mothers’ characteristics, behavior, intentions, attitudes, subjective norms, perceived behavioral control, behavioral belief, normative belief, control of belief in the knowledge of mothers accessing dental and oral health information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Knowledge Category</th>
<th>Total</th>
<th>P value</th>
<th>Prevalence ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s age</td>
<td>&lt;35 years old</td>
<td>90 (69.8%)</td>
<td>39 (30.2%)</td>
<td>129 (100%)</td>
</tr>
<tr>
<td></td>
<td>≥ 35 years old</td>
<td>94 (75.8%)</td>
<td>30 (24.2%)</td>
<td>124 (100%)</td>
</tr>
<tr>
<td>Education level</td>
<td>Low</td>
<td>131 (72.8%)</td>
<td>49 (27.2%)</td>
<td>180 (100%)</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>53 (72.6%)</td>
<td>20 (27.4%)</td>
<td>73 (100%)</td>
</tr>
<tr>
<td>Working status</td>
<td>Not working</td>
<td>90 (75%)</td>
<td>30 (25%)</td>
<td>120 (100%)</td>
</tr>
<tr>
<td></td>
<td>Working</td>
<td>94 (70.7%)</td>
<td>39 (29.3%)</td>
<td>133 (100%)</td>
</tr>
<tr>
<td>Income</td>
<td>&lt;Rp. 3,000,000</td>
<td>113 (74.3%)</td>
<td>39 (25.7%)</td>
<td>152 (100%)</td>
</tr>
<tr>
<td></td>
<td>≥ Rp. 3,000,000</td>
<td>71 (70.3%)</td>
<td>30 (29.7%)</td>
<td>101 (100%)</td>
</tr>
<tr>
<td>Health financing</td>
<td>None</td>
<td>58 (71.6%)</td>
<td>23 (28.4%)</td>
<td>81 (100%)</td>
</tr>
<tr>
<td></td>
<td>Health Insurance</td>
<td>126 (73.3%)</td>
<td>46 (26.7%)</td>
<td>172 (100%)</td>
</tr>
<tr>
<td>Behavior</td>
<td>Poor</td>
<td>34 (79.1%)</td>
<td>9 (20.9%)</td>
<td>43 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>150 (71.4%)</td>
<td>60 (28.6%)</td>
<td>210 (100%)</td>
</tr>
<tr>
<td>Intention</td>
<td>Poor</td>
<td>29 (85.3%)</td>
<td>5 (14.7%)</td>
<td>33 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>155 (70.8%)</td>
<td>64 (29.2%)</td>
<td>219 (100%)</td>
</tr>
<tr>
<td>Attitude</td>
<td>Poor</td>
<td>11 (68.8%)</td>
<td>5 (31.3%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>173 (73%)</td>
<td>64 (27.2%)</td>
<td>237 (100%)</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>Poor</td>
<td>56 (72.7%)</td>
<td>21 (27.3%)</td>
<td>77 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>128 (72.7%)</td>
<td>48 (27.3%)</td>
<td>176 (100%)</td>
</tr>
<tr>
<td>Perceived behavior</td>
<td>Poor</td>
<td>8 (100%)</td>
<td>0 (0%)</td>
<td>8 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>176 (71.8%)</td>
<td>69 (28.2%)</td>
<td>245 (100%)</td>
</tr>
<tr>
<td>Behavioural belief</td>
<td>Poor</td>
<td>12 (75%)</td>
<td>4 (25%)</td>
<td>16 (100%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>172 (72.6%)</td>
<td>65 (27.4%)</td>
<td>237 (100%)</td>
</tr>
</tbody>
</table>
The caries rate in pre-school age children (4-6 years) in the Mojo Health Center working area obtained very high prevalence rate, i.e. 84.7% with a very high severity (def: 6.9). The high incidence of caries was influenced by children’s behavior in maintaining dental and oral health. According to Bozorgmehr (2013)\(^5\), children’s behavior in maintaining dental and oral health is closely related to the behavior of the surrounding people, especially mother. Pre-school children tend to not be able to decide something by themselves, but are more likely to imitate the people around them, especially mothers\(^1\). This causes the mother’s role to be needed at this stage because the mother is the closest person to the child to provide examples, education, advice, and advice on dental health\(^1\).

Knowledge of parents, especially mothers, in terms of dental and oral health will provide an important role in the education process for children. Mothers with few knowledge tend to not pay attention to the health of their children’s teeth and mouth\(^6\). Knowledge of mothers in dental and oral health can be influenced by several factors, including, education, employment/income, age, and socio-cultural environment. Mother’s education will provide a role in the process of obtaining and processing dental health information and knowledge. Mothers with low education level tend to have an impact on low knowledge too.

In this study, low mother’s knowledge can be influenced by a lack of access to information regarding oral and dental health\(^7\). In this study, mothers’ behavior in accessing information about dental and oral health was analyzed. The intended behavior included taking time and energy to find information, reading and understanding information about children’s dental and oral health.

Based on the Theory of Planned Behavior, the behavior of mothers in accessing children’s dental and oral health information is influenced by the intention of the mothers. Mother’s intention in behaving is influenced by the presence of mother’s attitude, subjective norms, and perceptions of behavior control. These three aspects are influenced by the presence of several beliefs, namely behavioral, control, and normative beliefs\(^8\).

From the model analysis carried out in this study, it was found that perceived behavioral control to directly influence the behavior of mothers accessing dental and oral health information without affecting intention first. Mother’s intention is only influenced by subjective attitudes and norms. With these results, it can be said that this research was more in accordance with the Theory of Reasoned Action (TRA). It means that mothers do not carry out long-term and mature planning to conduct behaviors to access dental and oral health information. Mothers prioritize strong motives or reasons to eventually emerge behavior in accessing dental and oral health information.

Based on the results of statistical test analysis illustrated by p value and prevalence ratio, the most influential variables on mothers’ behavior in accessing dental and oral health information, from the most significant, were (1) mothers’ intentions, maternal behavioral beliefs, (3) mothers’ control beliefs, (4) mothers’ attitudes, (5) mothers’ subjective norms, (6) mothers’ normative beliefs, and (7) perceptions of mothers’ behavior control. It shows that intention is a major risk factor in influencing poor mothers’ behavior in accessing children’s dental and oral health information.\(^9\)

**Conclusion**

Mothers’ behavior in accessing dental and oral health information is influenced by intentions, attitudes, subjective norms, and perceived behavioral control.

**Conflict of Interest:** Nill

**Acknowledgement:** Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga

**Source of Funding:** Self funding

**Ethical Clearance:** Taken

<table>
<thead>
<tr>
<th>Normative belief</th>
<th>Poor</th>
<th>15 (75%)</th>
<th>5 (25%)</th>
<th>20 (100%)</th>
<th>0.81</th>
<th>1.03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control belief</td>
<td>Good</td>
<td>169 (72.5%)</td>
<td>64 (27.5%)</td>
<td>233 (100%)</td>
<td>0.37</td>
<td>1.2</td>
</tr>
<tr>
<td>Poor</td>
<td>13 (86.7%)</td>
<td>2 (13.2%)</td>
<td>15 (100%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


Physiological Features of Platelets in Aging Outbred Rats


1 South-West State University, st. 50 years of October, 94, Kursk, Russia, 305040; 2 All-Russian Research Institute of Animal Physiology, Biochemistry and Nutrition, Branch, Federal Science Center for Animal Husbandry named after Academy Member L.K. Ernst, Borovsk, Russia, 249013; 3 Russian State Social University, St. V. Pika, 4, Moscow, Russia, 129226; 4 Kursk State Medical University, St. K. Marx, 3, Kursk, Russia, 305003

ABSTRACT

Aging is recognized as an inevitable biological process. He proved the presence of the genetic component and the environmental component. The aging process affects all organs, gradually weakening their viability and making the death of the body more and more likely. The hemostasis system, including platelets, is also involved in the implementation of the aging process. They also show signs of aging, which play an important role in the development of various pathologies with age. In the experiment in aging rats, a gradual increase in platelet aggregation properties was observed. This leads to an increase in the number of activated blood platelets in their blood and an excess of their aggregates of any size. These changes make a serious contribution to the development with age of a decrease in the reactivity and resistance of the organism, making many of the negative effects from the environment very dangerous for an aging animal. An increase in the intravascular activity of platelets in aging rats indicated an increase in the number of inducers of their aggregation in their blood and an increase in the sensitivity of platelets to them. In rats in the late stages of ontogenesis, this is accompanied by a gradual decrease in the number of inactive discoid platelet varieties in the blood. The increase in the blood of old rats of the number of different active forms of blood platelets is a consequence of the enhancement of their aggregation properties and causes the development of thrombophilia during the progression of aging.

Keywords: aging, rats, aggregation, platelets, intravascular platelet activity.

Introduction

Aging is a very complex biological process. It has a very strong genetic component 1 and a significant environmental component 2. The aging process always affects all organs of the body, gradually weakening their viability and making it more and more likely to die 3. In the hemostasis system, including in platelets, signs of aging are also noted 4, which play an important role in the development of various pathologies with age 5. Particularly significant aspects of platelet function in the clinic of internal diseases 6,7.

Timely and accurate identification of the level of platelet activity 8 and its early and effective correction is in many cases the basis for successful therapy of existing diseases 9,10 and their complications, largely determining the prognosis for life and health 11,12,13. At the same time, in the search for effective therapeutic effects 14,15 with very many diseases in humans 16,17 it is difficult to do without research in the conditions of experimental models in rodents, including outbred rats.

Due to the importance of platelet hemostasis in the formation of age-related pathology and the need to improve the approaches to its treatment, it is important to continue to determine the level of platelet activity in aging outbred rats under normal environmental conditions 18. This information can serve as a basis for understanding the role of platelets in the pathogenesis of age-related pathology and the success of further research in the experiment of secretion options by influencing hemostasis during late ages 19,20.
In this regard, the goal of the work is to find out the peculiarities of age-related changes in platelet activity in outbred rats in the late stages of their ontogenesis.

Materials and Method

The study was conducted in strict accordance with the ethical principles established by the European Convention for the Protection of Vertebrate Animals used for experimental and other scientific purposes (adopted in Strasbourg on March 18, 1986 and confirmed in Strasbourg on June 15, 2006).

The work was performed on 96 healthy outbred male rats. They were kept during their life on the usual diet of the vivarium: 34 heads at the age of 18 months, 30 rats having the age of 24 months and 32 heads at the age of 30 months. Before being included in the study group, all rats did not participate in other experiments and did not have any pathological processes in the body. The control group consisted of outbred healthy male rats at the age of 6 months, a total of 31 animals.

In rats taken in the study, plasma lipid peroxidation activity was determined by recording the level of thiobarbituric acid-active products in it, using the kit manufactured by Agat-Med (Russia), and by the concentration of acylhydroperoxide in their plasma. In the plasma of animals, the level of its antioxidant potential was evaluated. The quantitative content of platelets in the composition of the capillary blood was carried out using the camera Goryaeva. The expression of platelet aggregation was ascertained in the course of using a visual micromethod in response to the use of ADP (0.5 × 10⁻⁴ M), thrombin (0.125 U/ml), collagen (dilution 1: 2 of the main suspension), ristomycin (0.8 mg/ml), hydrogen peroxide (7.3 × 10⁻³ M) and adrenaline (5 × 10⁻⁶ M). The expression of intravascular platelet activity was determined by phase contrast microscopy. The results obtained in the work were subjected to statistical processing using Student’s t-test.

Research Results

In animals, pallor of mucous membranes, dullness of hair, its significant thinning, decrease in general physical activity, weakening of appetite, as well as a low level of interest in everything around, appeared.

In the examined rats, with increasing age, an increase in the plasma concentration of lipid peroxidation products was found (at 18 months acylhydroperoxides 1.62 ± 0.026 D₂₃₃/1 ml., Thiobarbituric acid-active products 3.85 ± 0.019 μmol/l, at 2.5 years 1.93 ± 0.064 D₂₃₃/1 ml and 4.37 ± 0.046 μmol/l against the background of a decrease in the activity of antioxidants from 30.9 ± 0.37% in 18 months to 25.0 ± 0.31% in 30 months). The level of these indicators in the control was respectively 1.43 ± 0.008 D₂₃₃/1 ml, 3.44 ± 0.018 μmol/l and 34.9 ± 0.014%.

The concentration of platelets in the blood of rats of all the observed groups corresponded to the norm. The severity of platelet aggregation in rats during aging gradually increased. It first occurred at the age of 30 months in response to collagen (26.1 ± 0.12 s), a little later on ADP and ristomycin, and even later on H₂O₂ (34.6 ± 0.16 s) and thrombin (45.5 ± 0.17 s). The most delayed platelet aggregation occurred in rats aged 30 months in the case of adrenaline (80.2 ± 0.23 s) (table).

The blood levels of aging rats platelet-dysocytes decreased as they grew in chronological age and was minimal at 30 months of age - 68.0 ± 0.20% (in the control - 78.8 ± 0.12%). Against this background, animals showed an increase in the total number of active platelet species, reaching 32.0 ± 0.25% at the age of 30 months (in the control 21.2 ± 0.12%). At the same time, the level of disco-echinocytes in them was increased to 17.8 ± 0.18%. They combined this with high blood levels of spherocytes, sphericulo-echinocytes and bipolar forms, which were 7.9 ± 0.14%, 5.1 ± 0.08% and 1.2 ± 0.03% in the oldest group of rats, respectively. Levels of small and large platelet aggregates in the blood of aging animals gradually reached levels of 7.4 ± 0.06 and 0.52 ± 0.003 free-lying platelets at 30 months. At the same time, their platelet count in the composition of the aggregates increased from 4.7 ± 0.08% at the age of 18 months to 6.9 ± 0.08% in 30 months of ontogenesis (table).
Table. Platelet activity in rats examined

<table>
<thead>
<tr>
<th>Registered Indicators</th>
<th>Aging rats, n = 96, M ± m</th>
<th>Control, n = 31, M ± m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18 months, n = 34</td>
<td>24 months, n = 30</td>
</tr>
<tr>
<td>Aggregation with ADP, s</td>
<td>38.1 ± 0.18</td>
<td>35.2 ± 0.12*</td>
</tr>
<tr>
<td>Aggregation with collagen, s</td>
<td>32.1 ± 0.10</td>
<td>29.8 ± 0.10*</td>
</tr>
<tr>
<td>Aggregation with thrombin, s</td>
<td>53.2 ± 0.16*</td>
<td>49.0 ± 0.14*</td>
</tr>
<tr>
<td>Aggregation with ristomycin, s</td>
<td>46.3 ± 0.07</td>
<td>43.4 ± 0.18*</td>
</tr>
<tr>
<td>Aggregation with H₂O₂, s</td>
<td>42.3 ± 0.12</td>
<td>38.7 ± 0.09*</td>
</tr>
<tr>
<td>Aggregation with adrenaline, s</td>
<td>97.8 ± 0.10*</td>
<td>89.9 ± 0.19**</td>
</tr>
<tr>
<td>Discocytes, %</td>
<td>77.4 ± 0.16</td>
<td>72.2 ± 0.12**</td>
</tr>
<tr>
<td>Disco-echinocytes, %</td>
<td>14.0 ± 0.15*</td>
<td>15.3 ± 0.14*</td>
</tr>
<tr>
<td>Spherocytes, %</td>
<td>5.0 ± 0.10</td>
<td>7.3 ± 0.11**</td>
</tr>
<tr>
<td>Sphero-echinocytes, %</td>
<td>2.5 ± 0.07</td>
<td>4.2 ± 0.09**</td>
</tr>
<tr>
<td>Bipolar forms, %</td>
<td>1.1 ± 0.04*</td>
<td>1.0 ± 0.02*</td>
</tr>
<tr>
<td>Sum of active forms, %</td>
<td>22.6 ± 0.10</td>
<td>27.8 ± 0.16**</td>
</tr>
<tr>
<td>Platelet count in aggregates, %</td>
<td>4.7 ± 0.08</td>
<td>5.8 ± 0.05**</td>
</tr>
<tr>
<td>The number of small units of 2-3 platelets per 100 free platelets</td>
<td>3.5 ± 0.07*</td>
<td>5.5 ± 0.08**</td>
</tr>
<tr>
<td>The number of medium and large units of 4 or more platelets per 100 free-lying platelets</td>
<td>0.14 ± 0.002*</td>
<td>0.35 ± 0.004**</td>
</tr>
</tbody>
</table>

Legend: the reliability of differences in performance between control and aging rats – *p<0.05; **p<0.01.

Discussion

The functioning of the whole organism is very closely connected with the work of all its life support systems and the response to any environmental factors\(^2^3\). A very significant role in this process is played by the functioning of the mechanisms of hemostasis and the characteristics of the rheological parameters of the blood\(^2^4\). Their condition greatly limits the level of oxygen and nutrients in the tissue, which is especially important with age to maintain optimum homeostasis\(^2^5\). The activity of blood platelets, which is very clearly controlled by the vessels\(^5\) and the level of lipid peroxidation in plasma and platelet membranes\(^1^3,2^6\), is of great importance for the circulation processes in the capillaries.

During aging in rats, an increase in the activity of their platelets is observed, which reaches a maximum by 30 months. Apparently, this is caused by an increase in the sensitivity of their platelet receptors to any external influences. These include an increase in the amount of von Willebrand factor in the plasma, which is an obligate cofactor of the platelet adhesion process. This is compounded by the increase in the number of receptors to it on their membranes. The onset in the rats with age, the enhancement of the processes of reception on the surface of the blood plates should be associated with the development during aging of complex adaptive processes in the membranes of platelets\(^9,2^6\).

The detected increase in platelet aggregation activity in response to different inducers in rats aged between 18 and 30 months of age showed an age-related development of the activity of the aggregative properties of their platelets. The accelerated development of platelet aggregation in these conditions in response to strong aggregation inducers (collagen and thrombin) seems to be associated with the activation of platelet phospholipase C and the process of phosphorylation of contractile platelet proteins. This is largely due to an increase in the amount of inositol trisphosphate in them, which leads to the stimulation of the release of Ca\(^2+\) from its depot and to an increase in its level inside the platelets\(^2^7\). Activation of these mechanisms inevitably leads to an intensification in platelets of actomyosin contraction processes. In addition, the increasing
potential of platelet thromboxane-forming enzymes with age also plays a significant role in enhancing platelet aggregation with age. The acceleration of platelet aggregation found in rats with age in response to weak agonists of aggregation, in particular to ADP and adrenaline, indicated an increase in the number of receptors for them on the surface of platelets and an increase in the expression of fibrinogen receptors on them. This was accompanied by an increase in the level of phospholipase A2 activity in them, which determined the growth as the arachidonic acid output from the membranes ages and the activation of thromboxane A2 synthesis from it.

The increase in intravascular platelet activity detected in aging rats indirectly indicated an increase in the number of inducers of their aggregation in their blood and an increase in the sensitivity of platelets to them. At the same time, in the blood of rats that are in the late stages of ontogenesis, a gradual decrease in the number of inactive discoid platelet species is observed, which also confirms the growth of activity of their receptor apparatus. The increase in the blood of old rats of the number of different active forms of blood platelets is a consequence of the enhancement of their aggregation properties and causes the development of thrombophilia during the progression of aging.

**Conclusion**

In healthy aging rats, a gradual increase in platelet aggregation properties is normal. This leads to an increase in the number of activated blood platelets in their blood and an excess of their aggregates of any size. These changes make a serious contribution to the development with age of a decrease in the reactivity and resistance of the organism, making many of the negative effects from the environment very dangerous for an aging animal.

**Conflict of Interest:** No conflict of interest is declared.

**Sources of Funding:** The study was conducted at the expense of the authors.

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Effect of Adding Different Levels of Anise, Fenugreek, Anise and Fenugreek Mixture and Sage to the Diet on the Total Bacterial Count and Colonic Bacteria in the Intestines of Broilers

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1Faculty of Agriculture, University of Anbar; 2Faculty of Veterinary Medicine, University of Fallujah

ABSTRACT

The present study included two experiments. The first experiment was carried out to investigate the effect of adding different levels of anise, fenugreek and their mixture powder, to the diet and the second experiment was conducted to determine the effect of adding different levels of sage powder to the diet on the preparation of total bacteria count and coliform bacteria in the intestines of the broilers. In the two experiments, 390 one-day-old Ross 308 hybrid broilers were used with an average weight of 41g. At the first experiment, 270 one-day-old broiler chicks were randomly divided into 9 dietary treatments with 3 replicates per treatment and 10 chicks per replicate (30 chicks per treatment). The dietary treatments involved T1: Control treatment was basal diet (without supplementation), T2, T3, T4, T5, T6, T7, T8 and T9 were basal diet with 0.5 % of anise, 1% of anise, 0.5% of fenugreek, 1% of fenugreek, 0.5:0.5% anise:fenugreek, 1.0:0.5% anise:fenugreek, 0.5:1.0% anise:fenugreek and 1.0:1.0% anise:fenugreek powders respectively. As for the second experiment, 120 one-day-old broiler chicks were randomly divided into four treatment with three replicates (each replicate 10 chicks). The dietary treatments included T1: control treatment (basal diet), T2, T3, T4 were basal diet supplemented with 0.5, 1.0 and 1.5% of sage powder respectively. The results showed a significant decrease (P<0.05) in the total bacterial count and coliform bacteria in the intestines of the broiler chickens for all addition treatments and both experiments compared to control treatment. The results also showed a significant (P<0.05) decrease in the total aerobic bacteria and coliform bacteria count in broiler intestine at high levels of herbs and their mixture added to the diet compared with control treatment. Significantly, the interaction treatments between anise and fenugreek, reduced the number of bacteria compared to T1, T2, T3, T4 and T5. It can be concluded that the addition of anise, fenugreek and sage to the broiler diets led to a significant reduction in the numbers of total bacteria and colon bacteria in the intestines which improves health situation that reflected positively on productive performance of broilers.

Keyword: Anise, Fenugreek, Total Bacterial Count, Colonic Bacteria, Broilers

Introduction

The researchers drew attention to the use of medicinal plants, herbs and their extracts as feed additives in poultry diets for their content of active substances and volatile oils1 their effects on productive and physiological traits, and the immunity of the body against microbes as well as their stimulating effect on the digestive system2. Anise (pimpinella anisum) is an herb known to have been used since the time of the Pharaohs and Greeks in the field of feed additives as a kind of spices3. Anise seeds have many properties such as, antiviral, antibacterial, antifungal, diuretic and antioxidant. Most of these properties are due to the presence of anethole, the active compound in anise4. Anise seeds can be effective growth promoters of anise because of their catalytic role in the production of gastric juices and their antimicrobial effects2. Anise seed oil has antifungal and antimicrobial properties and anti-parasites5,6.7 found that the use of anise in the diet of quail bird for six weeks resulted in a significant decrease in the number of pathogens and an increase in the number of non-harmful microorganisms in anise treatments compared with the

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control treatment. A reported a decrease in E. coli and Staphylococci in the small intestine, colon of laying chickens and broilers when adding anise to the diet. The seeds of fenugreek (trigonella foenum graecum) have been used since ancient times because of their medicinal effectiveness against many diseases as well as their lack of deposition in the tissues. The results of 11 indicated the natural antioxidant activity of fenugreek seed compared to industrial antioxidants, which contain a good proportion of the compounds of saponins, alkaloids and flavonoids that play an important role in lowering the level of glucose, cholesterol and triglycerides in animal blood. The essential oils of the sage have a positive effect on pathogenic microorganisms that feeding rabbits and broilers with sage extracts led to anti-bacterial and fungal efficacy as well as the essential oils of sage and its oil are alpha-thujone and beta-thujone, Camphor and Cineole as well as the essential oils of sage have anti-bacterial and fungal efficacy pointed out that feeding rabbits and broilers with sage extracts led to increased cellular impotence activity (phagocytosis) in the blood. The essential oils of the sage have a positive effect on pathogenic microorganisms.

Materials and Method

This study was conducted in the poultry field of the Faculty of Veterinary Medicine, University of Fallujah for 42 days, which lasted from 13 October to 23 November 2017. It included two experiments: At the first experiment, 270 one-day-old broiler chicks were randomly divided into 9 dietary treatments with 3 replicates per treatment and 10 chicks per replicate (30 chicks per treatment). The dietary treatments involved:

T1: Control treatment was basal diet (without supplementation), T2, T3, T4, T5, T6, T7, T8 and T9 were basal diet with 0.5% of anise, 1% of anise, 0.5% of fenugreek, 1% of fenugreek, 0.5:0.5% anise:fenugreek, 1.0:0.5% anise:fenugreek, 0.5:1.0% anise:fenugreek and 1.0:1.0% anise:fenugreek powders respectively.

Second Experiment: In this experiment, 120 one-day-old unsexed broiler (Ross) from Turkish origin obtained from kebisa hatchery in Anbar province with an average weight of 41 g, broiler breeds were distributed at one day on 4 treatments with 3 replicates per treatment and 10 chicks (30 chick per transaction). The dietary treatments included T1: control treatment (basal diet), T2, T3, T4 were basal diet supplemented with 0.5, 1.0 and 1.5% of sage powder respectively. A continuous lighting program (24 hours/day) for the duration of the experiment and the protective program according to the conditions of the area were used in this study. As for nutrition, the chicks were fed ad libitum on two diets: starter diet from 1 day to 21 days and grower diet from 22 days to 42 days (Table 1) while the medicinal plants have been obtained from the local market.

Microbial Study: The contents of the small intestine were collected in the two-decimal area for three birds per replicate (9 birds/treatment) at 42 days of the first and second experiments. The standard method was used in total bacterial count and total coliform count. Use MacConkey broth agar media, MacConkey agar N. broth, N. agar and incubation at 37 °C. The total number of species was calculated according to 19.

Statistical Analysis: Experimental data were analyzed using Complete Randomized Design (CRD) to determine the effect of treatments on the studied traits and the smallest significant difference between the mean of different treatments was used to determine the differences based on what was stated 20.

<table>
<thead>
<tr>
<th>Table 1: Chemical composition of the experimental diets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutrition materials %</strong></td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>Yellow corn</td>
</tr>
<tr>
<td>Soybean meal</td>
</tr>
<tr>
<td>*Protein concentration (50 % protein)</td>
</tr>
<tr>
<td>corn oil</td>
</tr>
<tr>
<td>Limestone</td>
</tr>
<tr>
<td>Salt</td>
</tr>
<tr>
<td><strong>Chemical composition</strong></td>
</tr>
<tr>
<td>Crude protein</td>
</tr>
<tr>
<td>Metabolic energy (kcal/kg)</td>
</tr>
<tr>
<td>Energy : protein ratio</td>
</tr>
<tr>
<td>Lysine</td>
</tr>
<tr>
<td>Methionine</td>
</tr>
<tr>
<td>Calcium</td>
</tr>
<tr>
<td>Phosphorus</td>
</tr>
</tbody>
</table>
Animal protein: Kolden/Jordanian origin, which contains 50%, 2200 Kg, 6% fat, 3.5% raw fiber, 8% calcium, 3% phosphorus available, 2.75% lysine, 1.8% methionine, 2.3% Methionine + cysteine. **According to the chemical composition according to the analysis of feedstuffs contained in the**

**Results and Discussion**

The effect of the addition of anise, fenugreek and the interaction between them on the number of total bacteria and coliform bacteria in the intestine of broilers was noted (Table 3). The table indicates significant differences (P <0.05) between the different treatments where a significant decrease in the preparation of total bacteria and coliform bacteria for the supplemented treatments compared to control treatment. As shown in the same table, an increase in the addition level of anise and fenugreek to the diet resulted in a significant decrease (P <0.5) in the number of bacteria in the intestines of chicken as is observed in T3 (1% of anise) and T5 (1% of fenugreek) compared to T2 (0.5% of Anise) and T4 (0.5% of fenugreek). The table also showed that the interaction between the two herbs significantly (P <0.5) reduced the number of bacteria compared with the T1, T2, T3, T4 and T5. As for anise treatments, the results are consistent with**

**Table 2: Effect of the addition of anise, fenugreek and their interaction on the total number of bacteria and colon bacteria in the intestines of broilers**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Total bacterial count (x10^7 cell/g)</th>
<th>Number of colonic bacteria (x10^6 cell/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 (control treatment)</td>
<td>984 ± 8.08 A</td>
<td>566 ± 7.005 A</td>
</tr>
<tr>
<td>T2 (0.05 % of anise)</td>
<td>232 ± 11.21 B</td>
<td>186 ± 14.07 B</td>
</tr>
<tr>
<td>T3 (1% of anise)</td>
<td>190 ± 11.54 C</td>
<td>145 ± 12.11 C</td>
</tr>
<tr>
<td>T4 (0.05% of fenugreek)</td>
<td>248 ± 2.45 B</td>
<td>198 ± 6.66 B</td>
</tr>
<tr>
<td>T5 (1% of fenugreek)</td>
<td>201 ± 3.81 C</td>
<td>155 ± 2.01 C</td>
</tr>
<tr>
<td>T6 (0.5:0.5% anise and fenugreek)</td>
<td>17.7 ± 1.15 D</td>
<td>13.5 ± 1.14 D</td>
</tr>
<tr>
<td>T7 (1.0:0.5% anise and fenugreek)</td>
<td>15.5 ± 1.20 D</td>
<td>11.3 ± 0.57 D</td>
</tr>
<tr>
<td>T8 (0.5:1.0% anise and fenugreek)</td>
<td>17.6 ± 2.08 D</td>
<td>12.9 ± 0.66 D</td>
</tr>
<tr>
<td>T9 (1.0:1.0% anise and fenugreek)</td>
<td>14.3 ± 0.24 D</td>
<td>19.9 ± 0.66 D</td>
</tr>
</tbody>
</table>

The different letters indicate significant differences below (P <0.05).

As for the fenugreek, the obtained results were in agreement with finding of who detected that seeds of the fenugreek were the most important part of the herb in terms of the content of many active substances which made them antibacterial, anti-inflammatory, antifungal, antimicrobial and antioxidant as well as it has a role in improving the performance of poultry through its antibacterial activity and its positive effect on intestinal morphology. Additionally, it helps reduce cholesterol levels in poultry blood. revealed that both dandelion leaves and fenugreek seeds have antibacterial properties especially against Escherichia coli, while finding of showed that the fenugreek oil obtained from its seeds has several properties as antimicrobial, antiviruses, antioxidants and anti-inflammatory.

**Table 3: Effect of the addition of sage on total number of bacteria and colonic bacteria in the intestines of broilers**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Total bacterial count (x10^5 cell/g)</th>
<th>Number of colonic bacteria (x10^7 cell/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 (control treatment)</td>
<td>2367 ± 10.00A</td>
<td>710 ± 13.15A</td>
</tr>
<tr>
<td>T2 (0.05 % of Sage)</td>
<td>1519 ± 8.77B</td>
<td>132 ± 1.19B</td>
</tr>
<tr>
<td>T3 (1% of Sage)</td>
<td>211 ± 0.60C</td>
<td>43 ± 1.17C</td>
</tr>
<tr>
<td>T4 (1.5% of Sage)</td>
<td>98 ± 1.45C</td>
<td>32 ± 1.44C</td>
</tr>
</tbody>
</table>

The different letters indicate significant differences below (P <0.05).
The effect of the addition of sage on the total number of bacteria and coliform bacteria in broilers was detected (Table 3). The result indicates significant (P<0.5) differences between the different treatments where a significant decrease was found in the preparation of total bacteria and colonic bacteria for the supplemented treatments compared to T1. Furthermore, the results indicated significant differences between the addition of sage (T2, T3, and T4) where the higher addition level of the sage to the diet, the lower number of bacteria in the chicken intestines. The obtained results were consistent with finding of who demonstrated that the addition of medicinal plants (thyme, sage and rosemary) to the white chickens diet significantly reduced (P<0.05) the total number of coliform bacteria and the number of E. coli bacteria in the feces as well as the essential oils of the sage have a positive effect on pathogenic microorganisms.

Conclusions

It can be concluded that the addition of anise, fenugreek and sage to the broiler diets led to a significant reduction in the numbers of total bacteria and colon bacteria in the intestines which improves health situation that reflected positively on productive performance of broilers.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

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**Effect of Knowledge and Attitude Factors on Tuberculosis Incidents in Mandar Ethnic in The District of Majene West Sulawesi**

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Abstract

Tuberculosis is still one of the diseases that cause health problems in the community. Tuberculosis (TB) is an infectious disease caused by the bacterium Mycobacterium tuberculosis. Indonesia is ranked third in the world with the highest burden in the world for TB cases, this can be influenced by several factors. This study aims to determine the factors that influence the level of knowledge and attitudes regarding the prevention and spread of TB in the ethnic Mandar of the Rangas village, Banggai District, Majene Regency, West Sulawesi. This study used an observational analytic design. 200 respondents were selected by purposive sampling. Data collected included gender, age, family income, education, knowledge about TB, and the attitude of respondents. Data was processed using SPSS for univariate analysis and path analysis to understand the relationship of variables. The results showed that there was a significant relationship between the knowledge and attitudes of respondents with a value of 2,521.

**Keywords:** Tuberculosis, Incidents, Path Analysis, Knowledge, Attitude

Introduction

Tuberculosis (TBC) is a direct infectious disease caused by Mycobacterium Tuberkulosi. Until recently, TB is still a worldwide health problem where WHO reports in 2017 there are 14 countries in the world that experience a double burden of TB such as TB sensitive, MDR TB and TB/HIV, this condition is worse than the previous years globally estimated estimates > 300/100,000 residents of new TB cases occur in developing countries such as southern Africa in Indonesia and India¹.

The incidence of TB cases in Indonesia varies according to numbers and absolute if seen from the figures, Java is recorded as <400/100,000 population but if based on absolute numbers the highest incidence of TB cases is> 100,000 cases occur on the Java island and in the next report shows a map of TB cases based on the Province differ from one another².

West Sulawesi Province, implemented the DOTS strategy as an WHO recommended strategy that is believed to be effective in stopping the spread of TB, but the results have not been able to reduce the incidence of TB. Early case discoveries such as pulmonary tuberculosis can prevent and break the chain of transmission by making early detection and immediate treatment is prevention and treatment efforts that must be carried out simultaneously (parallel) and are simultaneous³.

West Sulawesi currently has a high incidence rate of 395 per 100,000 inhabitants. The description of the high incidence that has not been matched by high findings demands to find the right case finding method and scientifically accountable the idea of case finding that connects social determinants with the TB incident flow in tune with the recommendations of the 2016-2020 RAN TB Research²,⁴.

The research location is Majene Regency where this district is the center of the Royal Mandar ethnic and this district has a high incidence based on data obtained at Totoli puskesmas for three years showing a increasing trend of incidents from 2016 recorded 43 new cases, in 2017 there were 56 new cases and in 2018 there were 62 new cases in this district for 3 years TB control always showed that low case discovery rates never reached the target, reflected in the 2015 target is set at 80 % but only...
case discovery is 67% in 2016 the target was set at 90% but coverage was only 72%, so in 2017 the target was set at 90% and achievement was only 75%.

A high incidence rate should be followed by high discovery rates as well, based on the concept of social determinants that illustrate how to understand the factors that determine the incidence of TB disease. As explained earlier in this paper that the determinant of tuberculosis is mycobacterium tuberculosis but it is not the only one caused someone to become sick with TB, but it is still necessary to know the determinants outside themselves which are also called risk factors for TB disease known as determinants social TB. Based on the concept above, the researcher tried to describe the condition of the mandar ethnic real in the Rangas sub-district by age, sex, and level of education, and income towards knowledge and attitudes regarding the prevention and spread of TB in the community.

Materials and Method

Location and Research Design: This study was carried out in the Rangas village, Banggai District, Majene Regency, West Sulawesi in January - November 2018. The type of research used was operational research, with a quasi experimental design.

Population and Sample: The population in this study were all residents residing in the health center area of Rangas Village, Banggae Sub-District, Majene Regency, West Sulawesi. Sampling technic using selected purposive cluster sampling with number sample size of 258 people, from the selected sample size refers to 10% of opinions and also refers to SEM modeling, an analysis tool that requires a minimum of 100-200 samples, so that 200 samples were taken in this study. Residing in Rangas Village, and is willing to take part in this research as a respondent.

Data Collection Method: Data collection was conducted by researchers using questionnaires (age, sex, education, family income, knowledge and attitudes) of respondents about TB. The results of this study are presented in the form of tables and narratives and applied path analysis.

Results

Characteristics of the Sample: Table 1 shows the results of the univariate analysis, by sex showed most respondents were female that equal to 58.5%. age showed most respondents in the age group 31-40 was 62.5%. the level of education showed most respondents at the elementary school level that is equal to 62.5%. Based on the work the most respondents work as housewives who sell their husband’s catch which was equal to 31.5%. Family income per month the most respondents were in the group of Rp.500,001-Rp.1,000,000 which was by 43.0%

Based on the research variable, the respondent distribution n based on the level of knowledge and attitudes of respondents regarding TB, it shows that there were 58.5% of respondents who have sufficient level of knowledge about TB, and based on the variable attitude of respondents regarding TB there are 75.5% of respondents who have a fairly good attitude.

Path Analysis: In picture 1 the results of path analysis variable have a significant correlation between the knowledge and attitudes of the respondents (2.512) and there is no significant association between age, sex, family income, recent education with the respondents’ knowledge and attitudes to tuberculosis prevention.

Discussion

This study used a questionnaire as a measure of the level of knowledge about tuberculosis prevention and the attitude of respondents to TB patients in the community of Rangas, Banggai District, Majene Regency, West Sulawesi. Basically the level of public knowledge about TB disease in the research location is quite good. Even some people who became respondents already knew about the TB treatment procedure which requires a long time which is around 6 months. However, people’s knowledge about the causes of TB is still high, because there are still people who think that TB is caused by viruses or magical powers.

The path analysis results showed that there was a significant relationship between the level of knowledge about TB and the respondent’s attitude towards TB with a score of 2.512. The results of this study were also supported by the study of Daniel Tolossa which suggests that the low level of knowledge about TB can affect behavior in seeking health care and maintaining transmission of disease in the community. Similar results were also found in studies conducted in Bangladesh, which suggested that the main reason for the poor early
The high level of knowledge a person can cause changes in one’s perceptions and habits, behavior based on knowledge will last longer than those not based on knowledge. However, there are also studies that are not in tune with those conducted by Mohammad RN who say that there was no significant relationship between knowledge and attitudes towards the prevention and spread of TB in the community.

Path analysis result also showed that there was no correlation between age and level of knowledge and attitudes regarding the prevention and spread of TB. The results of this study were in tune with research conducted by Hilma P. Lubis et al which states that there was no relationship between age and duration of work with the level of knowledge and attitudes of midwives at community health centre in Medan (p = 0.191; p = 0.478 and p = 0.22; p = 0.649). The result happen because the knowledge was come from prior knowledge, personal experience, and other people and several other factors that can shape a person’s knowledge for a long time and knowledge will last until old. But this was different from the research of Urasa et al. who said that there was a significant relationship between the age of nurses and knowledge (p = 0.027) where nurses’ knowledge was better at a young age of 87.5%.

In his theory, age influences the development of capture power and one’s mindset, the older a person is, the better the processes of mental development, but at a certain age, the increase in mental development process is not as fast as when he was a teenager. Increasing one’s age can influence the increase in knowledge gained by Ar-Rasily and Puspita.

The results of path analysis showed that there was no relationship between the level of knowledge and attitudes with education (p = 1.586 and p = 0.497). This result, similar to the results of a study conducted by Urasa et al. and Hilma P. Lubis et al which showed that there was no significant relationship between knowledge and attitudes regarding the causes of cervical cancer with education level. This can happen because knowledge was not absolutely obtained from formal education, but can also be obtained from non-formal education. In fact, a person with a high level of education does not mean having a good level of knowledge, and vice versa. As with one’s attitude, a low level of education does not mean having a bad attitude.

The results of the path analysis conducted also showed that there was no significant relationship between sex with the level of knowledge and attitudes (p = 0.644 and p = 1.146). This research was in tune with the research conducted by ERWandwalo and O. Morve where he said that knowledge was not significantly affected by gender or place of residence.

In this study also found that there was no association between income per month and the level of knowledge and attitudes towards the prevention and spread of TB. In tune with this, Portero Navio J., L et al stated that respondents who did not seek health services in TB cases were significantly correlated with low family monthly income. This can happen because not everyone with low income cannot provide special facilities to obtain knowledge and information regarding the prevention and spread of TB. In addition, knowledge and examples of attitudes can also be obtained from anywhere.

However, this study was not in tune with previous studies conducted in Nigeria by KE Agho et al which showed that the probability of having bad knowledge and negative attitudes towards TB was consistently significant with the poorest households in the region. This finding was also in tune with the national household survey conducted in the Philippines, Pakistan, and India, which shows that higher knowledge of TB was present among urban residents. This might reflect the fact that respondents who live in rural areas and come from low socioeconomic backgrounds may feel embarrassed and stigmatized because they suffer from tuberculosis.

Conclusions and Suggestions

This study concludes that based on path analysis conducted the knowledge level variable has a meaningful relationship with the attitude of the respondents, while the variables of age, sex, education, and income do not have a meaningful relationship with the level of education and attitudes about the prevention and spread of tuberculosis. Therefore, the local government can intervene as counseling on the prevention and spread of TB in the community, so that people can be consistent in the prevention of tuberculosis.
Table 1: Distribution of Respondents by Age, lighting, and Lactic Acid Employee PT PLN (Persero) Region Sulselrabar

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>83</td>
<td>41.5</td>
</tr>
<tr>
<td>Female</td>
<td>117</td>
<td>58.5</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>57</td>
<td>28.5</td>
</tr>
<tr>
<td>31-40 years</td>
<td>81</td>
<td>40.5</td>
</tr>
<tr>
<td>41-50 years</td>
<td>45</td>
<td>22.5</td>
</tr>
<tr>
<td>&gt; 50 years</td>
<td>17</td>
<td>8.5</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not School</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Elementary</td>
<td>125</td>
<td>62.5</td>
</tr>
<tr>
<td>High School</td>
<td>49</td>
<td>24.5</td>
</tr>
<tr>
<td>College</td>
<td>5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family Income</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Rp.500.000-500.001</td>
<td>78</td>
<td>39.0</td>
</tr>
<tr>
<td>Rp.1.000.001-1.500.000</td>
<td>86</td>
<td>43.0</td>
</tr>
<tr>
<td>Rp.1.500.001-3.500.000</td>
<td>23</td>
<td>11.5</td>
</tr>
<tr>
<td>Rp.3.500.000</td>
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</table>

Knowledge of TB is

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<tr>
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</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>117</td>
<td>58.5</td>
</tr>
<tr>
<td>Bad</td>
<td>83</td>
<td>41.5</td>
</tr>
</tbody>
</table>

Attitudes towards tuberculosis is

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>127</td>
<td>63.5</td>
</tr>
<tr>
<td>Bad</td>
<td>73</td>
<td>36.5</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2018

Figure 1: Results of Variable Age Analysis, Gender, Income, Education Against Level Knowledge and Attitudes About TB Spread Prevention.
Ethical Clearance: Taken from Faculty of Public Health Ethical committee

Source of Funding: Self

Conflict of Interest: Nil

REFERENCES


The Relationship between Psychoeducation and the Decrease in Family Burden of Diabetes Mellitus Patients, Magelang, Indonesia

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¹Health Polytechnic of Semarang, Indonesia; ²Provincial Health Office of North Sumatera, Indonesia

ABSTRACT

Diabetes Mellitus (DM) is a chronic disease that is frightening because a lifelong disease and can not be cured. Diabetics should pay attention to their blood sugar levels to improve their quality of life and can be a burden not only for the patient’s but also their family. One of the interventions to overcome this problem is psychoeducation. It is a therapy to provide information to individuals who are experiencing distress, providing education to improve skills and be able to understand and have coping due to illness that causes problems in family relationships. The study objective was to determine the effect of psychoeducation on the family and DM patients at the clinic of Prof. Dr Soerojo Magelang. It was an experimental design with pretest and post test. Intervention group will be given psychoeducation both patient and family while control group without psychoeducation. Respondents were patients and family with random allocation sampling. Before and after psychoeducation will be measured to the family about family burden, control regularly and family support. The result showed that variable of psychoeducation was realted to family burden (p <0.01). It was concluded that psychoeducation was significant to decrease family burden on family who had DM patient. Psychoeducation may help to minimize or prevent the effects of burden on family caregivers responsible for patients’ of DM.

Keywords: psychoeducation, diabetes mellitus, decrease family burden, Indonesia

Introduction

DM is a chronic disease that is frightening because its a lifelong disease and can not be cured(1,2) In 2013 based on Indonesia basic health research reported that an increase in prevalence of people with DM from 1.1% in 2007 to 1.5%.(3) Lifestyle of patients with DM need on planning meal (diet), exercise, blood glucose monitoring, therapy (if needed) and health education. Therefore, the role and support of sustainable family groups, relatives, health workers, nurses and extension is highly recommended.(4,5)

A baseline survey at the DM clinic at Prof. Dr Soerojo Magelang Hospital resulted that DM patients will obey regularly control and adhere to take medication when their blood sugar level arise. This proves that patients have less adherence on therapeutic management for DM due to lack of support from those around them, whereas to achieve therapeutic success desperately needs a lot of support and help from others around them.(6,7)

Therefore, the objective of this study was to determine the relationship between psychoeducation and the decrease in family burden of DM patients

Method

Study Design and Setting: This was an experimental design using pretest-posttest with comparation group. Population was all DM patients and family at clinic DM RSUP Prof DR. Soerojo Magelang. Sampling technique was random allocation. The total number of respondents was 36 people, 18 as intervention group and 18 as control group. The independent variable was psychoeducation, and the dependent variables were family burden, family support, and control regularly. Psychoeducation is a
therapy used to provide information to families and patients who experience distress, provide education to improve skills and be able to understand and have coping due to illnesses experienced by one family member which results in problems with family relationships.

**Data Collection**

Psychoeducation will be conducted in 8 sessions, each session will last for 60 minutes. Family burden will be measured using a questionnaire consisting of 12 statements related to family burden due to family members suffering from DM. Family support will be measured using a questionnaire of 12 questions. Control regularly will be measured using a questionnaire of The Summary of Diabates Self Care Activities (SDSCA). Drug and dietary compliance was measured by HbA1C examination.

**Statistical Analysis**

Data analysis by using univariate and bivariate with parametric test by using pair t-test, if the data is not normally distributed then non parametric test will be employed to know the difference of psychoeducation effect on intervention group and control group.

**Ethical Consideration**

The study protocol was approved by the Institutional Review Board of the Semarang Health Polytechnic of Ministry of Health of Republic of Indonesia. The aims, risks, and benefits of the study were explained to each participant, and they were asked to sign a consent form prior to enrolment in the study. Participants were also informed that they could quit at anytime during the interview session. After informed consent was obtained, the interviewers conducted the structured interviews.

**Result**

The total number of respondents in the intervention and control group was 36 people, 50% was male. Most respondents were at vulnerable aged (61-70 years) as many as 15 people (42%), with the highest age was 77 years and the lowest was 42 years (Table 1).

<table>
<thead>
<tr>
<th>Characteristics of respondent (n = 36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age group</td>
</tr>
<tr>
<td>&lt;50 year</td>
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<tr>
<td>51-60 year</td>
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<tr>
<td>61-70 year</td>
</tr>
<tr>
<td>&gt;71 year</td>
</tr>
<tr>
<td>Occupation</td>
</tr>
<tr>
<td>Retired</td>
</tr>
<tr>
<td>Private worker</td>
</tr>
<tr>
<td>Civil servant</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td>Length of suffering DM</td>
</tr>
<tr>
<td>1-5 year</td>
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<tr>
<td>6-10 year</td>
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<td>11-15 year</td>
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<tr>
<td>16-20 year</td>
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<tr>
<td>&gt;21 year</td>
</tr>
</tbody>
</table>

The statistical analysis resulted that the family burden variable in the intervention group decreased, while the variable of control regularly and family support increased. The level of HbA1C in the intervention group decreased (Table 2).

**Table 1: Characteristics of respondent (n = 36)**

<table>
<thead>
<tr>
<th>Characteristics of respondent</th>
<th>n = 36</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18</td>
<td>50</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>50</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;50 year</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>51-60 year</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>61-70 year</td>
<td>15</td>
<td>42</td>
</tr>
<tr>
<td>&gt;71 year</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
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<tr>
<td>Retired</td>
<td>14</td>
<td>39</td>
</tr>
<tr>
<td>Private worker</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>Civil servant</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>31</td>
</tr>
<tr>
<td>Length of suffering DM</td>
<td></td>
<td></td>
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<tr>
<td>1-5 year</td>
<td>21</td>
<td>58</td>
</tr>
<tr>
<td>6-10 year</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>11-15 year</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>16-20 year</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>&gt;21 year</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

**Table 2: Comparison of variable family burden, control regularly, and family support between control and intervention group**

<table>
<thead>
<tr>
<th></th>
<th>Mean Before</th>
<th>Mean After</th>
<th>Mean difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family burden</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>1.39</td>
<td>2.17</td>
<td>0.78</td>
</tr>
<tr>
<td>Intervention</td>
<td>2.28</td>
<td>0.56</td>
<td>1.72</td>
</tr>
<tr>
<td>Control regularly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>29.67</td>
<td>31.06</td>
<td>1.39</td>
</tr>
<tr>
<td>Intervention</td>
<td>24.11</td>
<td>30.61</td>
<td>6.50</td>
</tr>
<tr>
<td>Family support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>34.94</td>
<td>31.39</td>
<td>3.55</td>
</tr>
<tr>
<td>Intervention</td>
<td>7.43</td>
<td>32.39</td>
<td>24.96</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>HbA1C</th>
<th>Control</th>
<th>9.57</th>
<th>10.04</th>
<th>0.47</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>7.43</td>
<td>7.72</td>
<td>0.29</td>
</tr>
</tbody>
</table>

The normality data test resulted that data was not normally distributed, so Mann Whitney U Test was employed. The result can be seen on Table 3.

<table>
<thead>
<tr>
<th>Family burden</th>
<th>Control regularly</th>
<th>Family support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann Whitney U Test</td>
<td>47.500</td>
<td>156.500</td>
</tr>
<tr>
<td>Z score</td>
<td>-3.824</td>
<td>-0.174</td>
</tr>
<tr>
<td>Sig (2-Tailed)</td>
<td>0.000</td>
<td>0.862</td>
</tr>
</tbody>
</table>

**Discussion**

There was a decrease in family burden in the control group and intervention group, indicating that the effect of psychoeducation was significant on the decrease of family burden of DM patient. The decrease in family burden on the intervention group can occur due to the empowerment of family caregiver and in the control group due to awareness within the self caregiver family.\(^{(5,9,10)}\) Psychoeducation is a process of behavior modification and behavior directly through the client’s total involvement in an intervention education program.\(^{(5)}\) The process not only provides cognitive information, but also experimentally gives participants the chance to experience their own changing attitudes and behaviors through the presence and assistance of others in a group activity.\(^{(11–13)}\)

Family support is the most important factor in the compliance of chronic disease management that given by family members that will provide physical and psychological comfort\(^{(9,14)}\). It will be more effective if given in accordance with what is wanted by the needy.\(^{(13,15,16)}\) DM management should be discussed as individualized therapeutic between patients and their families, and patients should receive coordinated medical care and integration of the health team.\(^{(11,12,14,17)}\)

Control regularly is the measurement of blood glucose levels performed in accordance with predetermined time intervals. DM treatment has the main goal to try to normalize insulin activity and blood glucose levels in an effort to reduce the occurrence of vascular and neuropathic complications.\(^{(9,18,19)}\) DM can cause chronic complications. Therefore, to avoid the occurrence of complications it must be managed to normalize insulin level.\(^{(11,19,20)}\)

The decrease of family burden on intervention group can occur because of family caregiver empowerment and giving intervention to family caregiver in taking care of DM patient. The provision of this intervention aims to increase knowledge about DM patient care such as health counseling by bringing in experts, asking family members about the burden felt by the family as a result of DM family members, and praising the participation of family members. The psychological burden experienced by family caregiver is due to their assessing the duties and situations of treatment encountered beyond their coping skills.\(^{(10,16,21)}\)

The results of the study showed an increase in the score of HbA1C examination from both control and the intervention group. The examination of HbA1C is one of the most important blood tests to evaluate blood sugar control. HbA1C levels will reflect the average blood sugar levels within 2-3 months before the examination.\(^{(19,20)}\) The higher the HbA1C level the higher the risk of complications, and vice versa. Psychoeducation is the provision of direct intervention to family members and DM respondents who have checked HbA1C levels.\(^{(22)}\)

**Conclusion**

Psychoeducation is significant to decrease family burden on family having DM patient. In addition, family caregivers should be taken into account by health professionals. They are an important part of the mental-health field, providing home care to patients with DM.
Funding

Research funding from Health Polytechnic of Semarang, Ministry of Health of Republic Indonesia.

Conflict of Interest: None.

Acknowledgements

The authors would like to acknowledge to the director of Prof. Dr Soerojo Magelang Hospital, the director of Health Polytechnic of Semarang, and to all the respondents.

REFERENCES


The Effectiveness of Fluoride on Zam Zam Water on Inhibition of Bacterial Growth Causes of Dental Plaques

Ahmad Muhlisin1, Muhammad Muslim2, Dinna Rakhmina3
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ABSTRACT

One of the good waters on this earth is Zam Zam water. Springs that are in the area of the Grand Mosque are not only clean but also have considerable benefits for health. The uniqueness of this spring also never runs out or is dry. Although every year millions of pilgrims take water from the Zam Zam well, the water continues to flow profusely. Zam Zam water is sterile because it has a high content of calcium, magnesium and fluoride minerals which are capable of functioning as an antimicrobial in a proportional amount and do not have the effect of poisoning the human body. The content of fluoride compounds in Zam Zam water has an antibiotic role. The purpose of this study was to determine the effectiveness of Zam Zam water fluoride in reducing the growth of Streptococcus sp and lactobacillus sp bacteria as a determinant of the causes of dental plaque. The method in this study was an experiment with design post-test with control group design. The results showed that Zamzam water fluoride was able to inhibit the growth of Streptococcus sp and Lactobacillus bacteria with water fluoride concentrations of Zam Zam 20% (0.12 ppm), 40% (0.22ppm), 60% (0.35 ppm), 80% (0.52ppm) and 100 % (0.68ppm). The decrease in the number of germ numbers occurred 100% in both Streptococcus sp and Lactobacillus sp at a concentration of 100% fluoride (0.68ppm). It is recommended as a basis for further research to compile and develop a model of Zam Zam water use as a mouthwash ingredient.

Keywords: Zam Zam water, Fluoride concentration, Streptococcus sp, and Lactobacillus.

Introduction

One of the good waters on this earth is Zam Zam water. Based on the results of the European laboratory tests on Zam Zam water samples showed that Zam Zam water has special physical properties that make it has many benefits and advantages. The main difference is Zam Zam, and other water is sterile Zam Zam water has a high content of calcium, magnesium and fluoride minerals so that it can function as an antimicrobial in a proportional amount and does not have poisoning effects on the human body.1,2,3

The content of the fluoride compound in Zam Zam water is one of the important ions which have the role of antibiotics. Therefore most toothpaste products prioritize the presence of fluoride content in their packaging which is used to fend off the accumulation of bacteria causing dental plaque. Flouride is a chemical compound that naturally exists in Zam Zam water at various concentrations. Proportional concentration is very beneficial for health, especially dental health because it can prevent tooth decay.4 Fluoride compounds serve to strengthen enamel by making it resistant to acids and inhibiting bacteria from producing acid. Fluorine is antibacterial, but its weakness can make gray stein in teeth.4,5

Dental plaque is one of the problems in dental and oral health, which is a soft deposit that is firmly attached to the teeth, consisting of microorganisms that multiply if someone neglects the cleanliness of their teeth and mouth. In plaque there are various kinds of bacteria and their metabolism, for example, the results

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of carbohydrate metabolism by acidogenic bacteria will result in the formation and accumulation of acid which results in decalcification and destruction of tooth surfaces resulting in carries.\textsuperscript{6,7}

The classic research of Keyes (1960) shows that plaque which is dominated by the bacteria \textit{Streptococcus mutan} and \textit{Lactobacillus} causes caries to form. \textit{Streptococcus mutan} and \textit{Lactobacillus} are cariogenic germs because they can form acid from carbohydrates that can be distributed immediately. These germs can thrive in an acidic atmosphere and can stick to the surface of the teeth because of their ability to make extra cell polysaccharides. These extra cell polysaccharides consist mainly of glucose polymers which cause the plaque matrix to have a consistency like gelatin. As a result, the helpful bacteria attach to the teeth and stick together. Plaque is getting thicker, so it will inhibit the function of saliva from carrying out its antibacterial activity.\textsuperscript{8}

Zam Zam water composition which contains high fluoride is thought to be able to suppress the growth of bacteria causing plaque. On herbal toothpaste containing fluoride can stimulate early caries remineralization and reduce the ability of bacteria to produce acid and fluoride-containing toothpaste to show antibacterial activity.\textsuperscript{9}

Method and Materials

Type of research is experimental with a \textit{pretest and posttest design with control group design}, which measures the effect of Zam Zam water on the inhibitory forces of \textit{Streptococcus sp} and \textit{Lactobacillus sp} in vitro. The research sample was Zam Zam water made with a concentration variation of 20\%, 40\%, 60\%, 80\%, 100\%. Preparation of bacterial stock; cultures of \textit{Streptococcus sp} and \textit{Lactobacillus sp} were scratched on blood agar media, incubated for 18-24 hours at 37 °C, and stored in the refrigerator. Preparation of bacterial suspension; inoculation of 1 colony of \textit{Streptococcus sp} and \textit{Lactobacillus sp} bacteria from bacterial stock and dipped in 10 ml 0.9% sterile NaCl solution, equated with turbidity with standard \textit{Mc. Farlan} 0.5 (estimated cell number 108), carried out repeatedly until the turbidity is the same.

The Minimum Inhibition Concentration (MIC) measurement was determined qualitatively based on whether or not each sample in the test tube was cloudy compared to the control. If clear, bacterial growth is inhibited and if cloudy, bacterial growth is not inhibited. Determination of Minimum Bactericidal Concentration (MBC) carried out the distribution of TSB suspension as a result of the MIC test on Nutrient Agar media, then incubated at 37 °C for 24 hours. It is viewed whether or not bacterial growth (qualitative) and the number of colonies (quantitative) were calculated. The lowest concentration/level that is not overgrown with bacteria is MBC.\textsuperscript{10}

Results and Discussion

Table 1: Results of Examination Fluoride

<table>
<thead>
<tr>
<th>No.</th>
<th>Packaging</th>
<th>Fluoride level (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100 ml</td>
<td>0.38</td>
</tr>
<tr>
<td>2.</td>
<td>100 ml</td>
<td>0 (Undetectable)</td>
</tr>
<tr>
<td>3.</td>
<td>100 ml</td>
<td>0.12</td>
</tr>
<tr>
<td>4.</td>
<td>100 ml</td>
<td>0.35</td>
</tr>
<tr>
<td>5.</td>
<td>100 ml</td>
<td>0.37</td>
</tr>
<tr>
<td>6.</td>
<td>5000 ml</td>
<td>0.69</td>
</tr>
<tr>
<td>7.</td>
<td>5000 ml</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Table 2: Levels of fluoride Zam Zam

<table>
<thead>
<tr>
<th>No.</th>
<th>Concentration</th>
<th>N</th>
<th>Concentration fluoride (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20%</td>
<td>7</td>
<td>0.12</td>
</tr>
<tr>
<td>2.</td>
<td>40%</td>
<td>7</td>
<td>0.22</td>
</tr>
<tr>
<td>3.</td>
<td>60%</td>
<td>7</td>
<td>0.35</td>
</tr>
<tr>
<td>4.</td>
<td>80%</td>
<td>7</td>
<td>0.52</td>
</tr>
<tr>
<td>5.</td>
<td>100%</td>
<td>7</td>
<td>0.68</td>
</tr>
</tbody>
</table>

Number 35 - 

Table 3: Growth of bacteria \textit{Streptococcus sp} and \textit{Lactobacillus sp} on Media Control

<table>
<thead>
<tr>
<th>No</th>
<th>Media Code</th>
<th>N</th>
<th>Average ∑ Germs \textit{Streptococcus sp}</th>
<th>Media Code</th>
<th>N</th>
<th>Average ∑ Germs \textit{Lactobacillus sp}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Z1.1</td>
<td>7</td>
<td>1031</td>
<td>Z2.1</td>
<td>7</td>
<td>2053</td>
</tr>
<tr>
<td>2.</td>
<td>Z1.2</td>
<td>7</td>
<td>1028</td>
<td>Z2.2</td>
<td>7</td>
<td>2054</td>
</tr>
<tr>
<td>3.</td>
<td>Z1.3</td>
<td>7</td>
<td>1031</td>
<td>Z2.3</td>
<td>7</td>
<td>2050</td>
</tr>
<tr>
<td>4.</td>
<td>Z1.4</td>
<td>7</td>
<td>1032</td>
<td>Z2.4</td>
<td>7</td>
<td>2039</td>
</tr>
<tr>
<td>5.</td>
<td>Z1.5</td>
<td>7</td>
<td>1033</td>
<td>Z2.5</td>
<td>7</td>
<td>2053</td>
</tr>
</tbody>
</table>

Total/Average 35 1031
Table 4: Number of Figures for *Streptococcus sp* and *Lactobacillus sp* on Zam Zam Water

<table>
<thead>
<tr>
<th>No.</th>
<th>Fluoride Concentration (%)</th>
<th>N</th>
<th>Average Germ Number of <em>Streptococcus sp</em></th>
<th>N</th>
<th>Average Number of Germs <em>Lactobacillus sp</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20 (0.12 ppm)</td>
<td>7</td>
<td>570</td>
<td>7</td>
<td>1440</td>
</tr>
<tr>
<td>2.</td>
<td>40 (0.22 ppm)</td>
<td>7</td>
<td>294</td>
<td>7</td>
<td>756</td>
</tr>
<tr>
<td>3.</td>
<td>60 (0.35 ppm)</td>
<td>7</td>
<td>193</td>
<td>7</td>
<td>292</td>
</tr>
<tr>
<td>4.</td>
<td>80 (0.52 ppm)</td>
<td>7</td>
<td>92</td>
<td>7</td>
<td>119</td>
</tr>
<tr>
<td>5.</td>
<td>100 (0.68 ppm)</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total/Average</td>
<td>35</td>
<td>230</td>
<td>35</td>
<td>521</td>
</tr>
</tbody>
</table>

Table 5: Fluoride Concentration as Minimum Inhibitory Power of *Streptococcus sp* and *Lactobacillus sp*

<table>
<thead>
<tr>
<th>No.</th>
<th>Fluoride Concentration (%)</th>
<th>Inhibiting Power Against <em>Streptococcus sp</em>.</th>
<th>Inhibitory Power Against <em>Lactobacillus sp</em>.</th>
<th>Control (bacteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>20 (0.12 ppm)</td>
<td>Turbid</td>
<td>Turbid</td>
<td>Turbine</td>
</tr>
<tr>
<td>2.</td>
<td>40 (0.22 ppm)</td>
<td>Clear</td>
<td>Crystal Clear</td>
<td>Turbid</td>
</tr>
<tr>
<td>3.</td>
<td>60 (0.35 ppm)</td>
<td>Clear</td>
<td>Crystal</td>
<td>Cloudy</td>
</tr>
<tr>
<td>4.</td>
<td>80 (0.52 ppm)</td>
<td>Clear</td>
<td>Crystal</td>
<td>Cloudy</td>
</tr>
<tr>
<td>5.</td>
<td>100 (0.68 ppm)</td>
<td>Clear</td>
<td>Crystal</td>
<td>Cloudy</td>
</tr>
</tbody>
</table>

Table 6: The ability of Zam Zam Water Flouride in Reducing Growth of *Streptococcus sp* and *Lactobacillus sp*

<table>
<thead>
<tr>
<th>No.</th>
<th>Zam Zam Water Flouride Concentration (%)</th>
<th>The decrease in Number of Germ Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><em>Streptococcus sp.</em> (%)</td>
<td><em>Lactobacillus sp.</em> (%)</td>
</tr>
<tr>
<td>1.</td>
<td>20 (0.12 ppm)</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>2.</td>
<td>40 (0.22 ppm)</td>
<td>63</td>
<td>71</td>
</tr>
<tr>
<td>3.</td>
<td>60 (0.35 ppm)</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>4.</td>
<td>80 (0.52 ppm)</td>
<td>94</td>
<td>91</td>
</tr>
<tr>
<td>5.</td>
<td>100 (0.68 ppm)</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1: Increased Germicidal Power Based on Fluoride Concentration
Zamzam used in this study is 5000 Zam of Zam Zam pack water with 0.68 ppm fluoride content. In a previous study conducted by Muhlisin found a fluoride content of 0.7 ppm\(^\text{1,3}\).

In the variation of the concentration of fluoride content in Zam Zam water which was used to inhibit the growth of \textit{Streptococcus sp} and \textit{Lactobacillus sp}, MIC was obtained at a concentration of 40\% (0.22 ppm). The decrease in the number of bacteria \textit{Streptococcus sp} and \textit{Lactobacillus sp} occurs at the time Fluoride concentration in Zam Zam water is increasing. This condition shows the influence of fluoride in inhibiting the growth of \textit{Streptococcus sp} and \textit{Lactobacillus sp}. Fluoride plays a role in inhibiting the growth of \textit{Streptococcus sp}. High concentrations of fluoride in the oral cavity can inhibit acid production by bacteria and can reduce the number of certain bacterial species\(^\text{11}\).

The Zam Zam water fluoride concentration has a significant effect on the germ numbers of both bacteria \textit{Streptococcus sp} and \textit{Lactobacillus sp} (\(P<0.05\)). Fluoride is one of the substances that can provide pressure on environmental factors that have an impact on the oral bacterial community, besides providing beneficial effects on caries prevention, it also affects the enamel and demineralization\(^\text{12}\). Fluoride inhibits bacterial metabolism so that it affects the rate of catabolism of carbohydrates which can be fermented into acid. The acid pH produced from carbohydrate fermentation leads to an increase in oral microbial communities in dental plaque-causing bacteria\(^\text{1,12}\).

The mechanism of action of fluoride on bacteria \textit{Streptococcus sp} and \textit{Lactobacillus sp} can inhibit the enzyme \textit{enolase} which plays a role in bacterial metabolism so that it cannot form plaques\(^\text{13}\). \textit{Enolase} catalyzes glycercate-2-phosphate to phosphoenolpyruvate. Phosphoenolpyruvate is further metabolized into acids such as lactic acid, formic acid, pyruvic acid which can cause demineralization of tooth enamel. Phosphoenolpyruvate is also an essential substrate for the phosphotransferase sugar transport system that is dependent on phosphoenolpyruvate and is found in many bacteria, including \textit{Streptococcus} and \textit{Lactobacillus}\(^\text{11,14}\).

In addition to containing fluoride, Zam Zam also contains bicarbonate, which can neutralize acids produced by bacteria that cause dental plaque (\textit{Streptococcus} and \textit{Lactobacillus}) and with hypertonic properties can cause hypotonic components of bacterial cells to lose water. The loss of water causes bacteria to dehydrate and die. Bicarbonate compounds can damage the bacterial matrix structure and weaken the bond between bacteria and tooth surfaces\(^\text{2}\).

The bacteria that can cause dental plaque, in general, are mutant \textit{Streptococcus} and \textit{Lactobacillus}. The two bacteria will then be able to cause caries formation. Interactions between bacterial plaque, food, and teeth can cause dental caries\(^\text{15}\). Fluoride can inhibit the activity of bacterial plaque enzymes including \textit{enolase}, \textit{phosphatase}, \textit{proton extruding ATPase}, and \textit{pyrophosphatase}; this activity will inhibit the process \textit{glycotransferase} that forms \textit{extracellular polysaccharides} plaque and interferes with plaque attachment\(^\text{6,17}\). Therefore the results of this study which show the ability of fluoride Zam Zam-containing water to dental plaque bacteria have the potential to be used as a mouthwash to prevent the development and decrease bacteria in the mouth that cause dental plaque. Sterile Zam Zam water contains high fluoride which has proportional antimicrobial properties and does not give poison to the body.

### Conclusion

Inhibitory effectiveness of the growth of \textit{Streptococcus sp} and \textit{Lactobacillus} begins at dilution of water fluoride Zam Zam 40\% (0.22 ppm). The ability of fluoride in Zam Zam water to inhibit the growth of \textit{Streptococcus sp} and \textit{Lactobacillus sp} respectively 0.12 ppm (30\%); (45\%), 0.22 ppm (63\%); (71\%), 0.35 ppm (86\%); (81\%), 0.52 ppm (94\%); (91\%) and 0.68 ppm (100\%).

### Ethical Clearance: Nil

### Source of Funding: Independent funds

### REFERENCES


4. SS, S M. Dentifrices and Mouthwashes Ingredients and Their Use. Oslo Univ. 2003; 1–44.


Maternal Attitude Toward Formula Feeding among Sample of Iraqi Mothers

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1Department of Pediatrics, AL-Kindy Medical College, University of Baghdad; 2Elwyia Pediatrics Hospital

ABSTRACT

Background: There is a well-documented decline of breast feeding rate especially in the developing world. Artificial feeding carries high risks of diarrhea, malnutrition, and death especially in a crisis situation in which there is poor water supply and poor sanitation.

Objectives: To assess maternal attitude and practices toward formula feeding regarding proper handling, sterilization, preparation and amount given.

Patients and Method: A cross sectional study done from the first November 2017 to the 30th of May 2018, in outpatient department of AL-Elwyia pediatric hospital. Mothers were interviewed and were asked some questions regarding sociodemographic criteria and their knowledge and practices toward formula feeding their children.

Results: Eighty two percent of mothers had less than five feeding bottles, 73.55% had improper sterilization, 80.3% had proper reconstitution of their infant formula, 54.7% of infants has improper caloric intake during the day and 51.9% only feed their infants in a proper technique.

Conclusion: The study concluded that there is low level of mother’s knowledge about formula-feeding handling in which the majority uses unsafe practices of feeding. The maternal knowledge is greatly influenced by culture and community beliefs rather than seeking a health professional advice.

Keywords: Attitude, formula feeding, practices, Mothers

Introduction

Breastfed infants are protected against many health problems such as gastrointestinal, respiratory infections and allergies1. Worldwide, only 40% of infants under six months of age are exclusively breastfed2. Despite the WHO recommendations and many health benefits of breast feeding, there is a well-documented decline of breast feeding rate especially in the developing world. Many factors have influenced infant feeding practices including social background of the mothers, mother’s fear of inadequacy of breast milk, their lack of awareness of the benefits of breast feeding and employment3. In Iraq still there is a low rate of early initiation of breastfeeding at 2012 (42.8%), exclusive breastfeeding under 6 months (19.6%) and breastfeeding at 2 years (22.7%), while there is a high rate of bottle feeding in Northern Iraq (64%) 4. A study done in Erbil showed that even with baby friendly hospital initiative there is a low rate of early initiation of breast feeding (38.1%) and exclusive breast feeding (15.4%) 5. Moreover, such rates are also the result of the wide distribution of infant formula to Iraq’s markets by many commercial formula companies has led many mothers to shift to bottle feeding. Nutrition program leaders consisting of UN agencies, nongovernmental organizations and government of Iraq today strongly urge those involved in the response to the Iraq crisis to avoid unnecessary illness and death in
children which can be achieved by protecting, promoting and supporting breast feeding and strongly discouraging the uncontrolled distribution of and use of breast-milk substitutes (including infant formula). Artificial feeding carries high risks of diarrhea, malnutrition, and death especially in situations in which there is poor water supply and poor sanitation and is a last resort only when other safer options have cannot be fully provided. There are remarkable economic disadvantage of using bottle or formula feeding especially in developing countries, a study done in Iraq 2016 showed that the mean cost of formula milk consumption for each infant who was exclusively bottle fed was (1584) Iraqi Dinars per day which equal to 1.2 dollars.

Powdered infant formula carries risk of contamination with E. sakazaki and salmonella which are the main pathogen that may cause serious illness and sometimes death in infants, this risk is increased with poor handling and preparation of infant formula.

**Patients and Method**

A cross-sectional study carried out at Al-Elwyia Pediatric Teaching Hospital, Baghdad, from first of November 2017-to 30th of May 2018.

Participants were mothers of exclusively formula fed infants; the sample size consists (422) mothers and their one day-12 months old infants who attend the outpatient clinic using a convenience sampling. All participants provided informed consent before inclusion in the study. Infants with chronic illness and congenital malformations were excluded from the study.

Eligible mothers were interviewed and asked a semi structured questionnaire formed by the researchers according to guidelines on formula feeding. The questionnaire consists of two parts:

A. Demographic characteristic (mother age, education, occupation, age and sex of infant)

B. Feeding practices: Number of bottles, way of sterilization, way of preparation, water used, number of feeding during the day, any change in milk formula, and the technique of feeding.

C. Ethical approvals were taken from Al-Elwyia Pediatric teaching hospital and from the ethical committee of Al-Kindi College of Medicine.

Standards for powdered infant formula preparation:

- Number of bottles five or more considered adequate
- Way of sterilization: considered appropriate if the mother wash her hand thoroughly with soap and water before preparation, brushes the bottles and teats thoroughly with soaped water and sterilize them with boiling for at least 10 minutes, or by using steam sterilization or sterilising liquid or tablets.
- Water used: boiled water should be used before preparation; bottled water is not usually sterile and must be boiled before use.
- Milk preparation: Preparation considered optimal if one level scoop of milk powder to one ounce of water or according to the manufacturer’s instructions.
- Technique of feeding considered appropriate if the baby in upright position with their head supported.
- Intervals between feeding is 2-4 hours in the first 6 months of life and more than that after introduction of solid food (Table 1)

**Table 1: Average daily fluid intake of infants during the first year of life**

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Average number of feeds over 24 hours</th>
<th>Daily fluid intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>6-8 (feed every 3-4 hours)</td>
<td>150 ml/kg</td>
</tr>
<tr>
<td>4-6</td>
<td>4-6 (feed every 4-6 hours)</td>
<td>150 ml/kg</td>
</tr>
<tr>
<td>7-9</td>
<td>4</td>
<td>120 ml/kg</td>
</tr>
<tr>
<td>10-12</td>
<td>3</td>
<td>110 ml/kg</td>
</tr>
</tbody>
</table>

Data were analyzed using SPSS version 18, Chi-square test was used for testing the association between variables under study, P value considered significant when it is less than 0.05

**Results**

A total of 422 mothers who took part in the study aged between 15 and 45 years, mean mother age was 26.3, majority were housewives (91.5%).

The demographic characteristic of the studied sample displayed in Table 2
Table 2: Socio-demographic characteristic of mothers and their children

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>39</td>
<td>9.2</td>
</tr>
<tr>
<td>20-24</td>
<td>132</td>
<td>31.3</td>
</tr>
<tr>
<td>25-29</td>
<td>125</td>
<td>29.6</td>
</tr>
<tr>
<td>30-34</td>
<td>66</td>
<td>15.6</td>
</tr>
<tr>
<td>35-39</td>
<td>42</td>
<td>10</td>
</tr>
<tr>
<td>40-45</td>
<td>18</td>
<td>4.3</td>
</tr>
<tr>
<td>Mother Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate+ Read and write</td>
<td>96</td>
<td>22.8</td>
</tr>
<tr>
<td>Primary school</td>
<td>132</td>
<td>31.3</td>
</tr>
<tr>
<td>Secondary school</td>
<td>112</td>
<td>26.5</td>
</tr>
<tr>
<td>College and higher</td>
<td>82</td>
<td>19.4</td>
</tr>
<tr>
<td>Mother Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>384</td>
<td>91</td>
</tr>
<tr>
<td>Employee</td>
<td>38</td>
<td>9</td>
</tr>
<tr>
<td>Number of Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>312</td>
<td>73.9</td>
</tr>
<tr>
<td>4-6</td>
<td>110</td>
<td>26.1</td>
</tr>
<tr>
<td>Age of the Child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6 Months</td>
<td>268</td>
<td>63.5</td>
</tr>
<tr>
<td>7-12 Months</td>
<td>154</td>
<td>36.5</td>
</tr>
<tr>
<td>Gender of the Child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>248</td>
<td>58.8</td>
</tr>
<tr>
<td>Female</td>
<td>174</td>
<td>41.2</td>
</tr>
</tbody>
</table>

Table 3 demonstrate maternal practices toward bottle feeding in which there were 82.1% of mothers had less than five feeding bottle, 73.55% had improper sterilization, 80.3% had proper reconstitution of their infant formula, 65.2% had proper intervals between feedings, 54.7% of infants has improper caloric intake during the day and only 51.9% feed their infants in proper technique.

Table 3: Maternal attitude and practices toward formula feeding

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of bottles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10</td>
<td>46</td>
<td>10.9</td>
</tr>
<tr>
<td>&lt; 5</td>
<td>347</td>
<td>82.1</td>
</tr>
<tr>
<td>Way of sterilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper</td>
<td>112</td>
<td>26.5</td>
</tr>
<tr>
<td>Improper</td>
<td>310</td>
<td>73.5</td>
</tr>
<tr>
<td>Way of preparation</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>339</td>
<td>80.3</td>
</tr>
<tr>
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<td>83</td>
<td>19.7</td>
</tr>
<tr>
<td>Intervals between feedings</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>275</td>
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<tr>
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<td>34.8</td>
</tr>
<tr>
<td>Calories per day</td>
<td></td>
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<tr>
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</tr>
<tr>
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<tr>
<td>Technique of feeding</td>
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<td></td>
</tr>
<tr>
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<td>Improper</td>
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</tr>
<tr>
<td>Any change in type of formula</td>
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<td></td>
</tr>
<tr>
<td>No</td>
<td>249</td>
<td>59</td>
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<tr>
<td>Yes</td>
<td>173</td>
<td>41</td>
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<td>Water used</td>
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<tr>
<td>Bottled</td>
<td>330</td>
<td>78</td>
</tr>
<tr>
<td>Tap water</td>
<td>93</td>
<td>22</td>
</tr>
<tr>
<td>Resources of maternal knowledge about formula feeding</td>
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<td></td>
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<tr>
<td>Health personnel</td>
<td>121</td>
<td>28.7</td>
</tr>
<tr>
<td>Home</td>
<td>258</td>
<td>61.1</td>
</tr>
<tr>
<td>Media</td>
<td>43</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Table 4 shows that there is significant correlation between maternal education and sterilization of bottles and daily caloric intake (P value were 0.008 and 0.012 respectively), while there is no significant correlation with other variables.

Table 4: Correlation between maternal education and practices of feeding

<table>
<thead>
<tr>
<th>Maternal education</th>
<th>Read and write</th>
<th>Primary school</th>
<th>Secondary school</th>
<th>College and higher</th>
<th>Total</th>
<th>P value</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Number of bottles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td>10</td>
<td>21.7</td>
<td>14</td>
<td>30.4</td>
<td>8</td>
<td>17.3</td>
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<td>Inadequate</td>
<td>86</td>
<td>22.9</td>
<td>118</td>
<td>31.4</td>
<td>104</td>
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<tr>
<td>Sterilization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper</td>
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<td>16.1</td>
<td>27</td>
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<td>34</td>
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<tr>
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<td>105</td>
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<thead>
<tr>
<th></th>
<th>Proper</th>
<th>21</th>
<th>103</th>
<th>30.4</th>
<th>95</th>
<th>28</th>
<th>70</th>
<th>20.6</th>
<th>339</th>
<th>100</th>
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<tr>
<td>Way of preparation</td>
<td>Improper</td>
<td>25</td>
<td>30</td>
<td>29</td>
<td>35</td>
<td>17</td>
<td>20.5</td>
<td>12</td>
<td>14.5</td>
<td>83</td>
</tr>
<tr>
<td>Calories/feed</td>
<td>Proper</td>
<td>51</td>
<td>19.8</td>
<td>82</td>
<td>31.8</td>
<td>73</td>
<td>28.3</td>
<td>52</td>
<td>20.1</td>
<td>258</td>
</tr>
<tr>
<td></td>
<td>Improper</td>
<td>45</td>
<td>27.4</td>
<td>50</td>
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<td>39</td>
<td>23.8</td>
<td>30</td>
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<td>164</td>
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<tr>
<td>Intervals between feeding</td>
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<td>74</td>
<td>26.9</td>
<td>57</td>
<td>20.7</td>
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<tr>
<td></td>
<td>Improper</td>
<td>32</td>
<td>21.8</td>
<td>52</td>
<td>35.4</td>
<td>38</td>
<td>25.8</td>
<td>25</td>
<td>17</td>
<td>147</td>
</tr>
<tr>
<td>Change in the milk type</td>
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<td>68</td>
<td>27.3</td>
<td>43</td>
<td>17.3</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>30</td>
<td>17.3</td>
<td>60</td>
<td>34.7</td>
<td>44</td>
<td>25.4</td>
<td>39</td>
<td>22.6</td>
<td>173</td>
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<tr>
<td>Daily calories</td>
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<td>20.9</td>
<td>47</td>
<td>24.6</td>
<td>61</td>
<td>32</td>
<td>43</td>
<td>22.5</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td>Improper</td>
<td>56</td>
<td>24.2</td>
<td>85</td>
<td>36.8</td>
<td>51</td>
<td>22.1</td>
<td>39</td>
<td>16.9</td>
<td>231</td>
</tr>
<tr>
<td>Technique of feeding</td>
<td>Proper</td>
<td>50</td>
<td>22.8</td>
<td>71</td>
<td>32.4</td>
<td>58</td>
<td>26.5</td>
<td>40</td>
<td>18.3</td>
<td>219</td>
</tr>
<tr>
<td></td>
<td>Improper</td>
<td>46</td>
<td>22.6</td>
<td>61</td>
<td>30.1</td>
<td>54</td>
<td>26.6</td>
<td>42</td>
<td>20.7</td>
<td>203</td>
</tr>
</tbody>
</table>

### Discussion

In fact there are a few studies in Iraq and developed countries had assessed maternal practices toward formula feeding especially with the widespread use of formula and aggressive marketing of powdered milk.

The study showed the majority of mothers in our sample were a housewife (91%) which is comparable to a study done by Mohammed-Hossein that showed 96.6% of mothers were housewives. The study showed the majority of mothers in our sample were a housewife (91%) which is comparable to a study done by Mohammed-Hossein that showed 96.6% of mothers were housewives. The current study showed that majority of mothers had poor experience with formula feeding practices regarding sterilization of bottles, milk preparation and the frequency of feeding; this finding is similar to other studies. Lack of mother’s knowledge regarding formula feeding recommendations, traditional beliefs and practices by the family and lack of health workers advice might be the most evident explanation of barriers to proper handling of infant formula.

The study showed that there is significant correlation between maternal education and bottle sterilization (P value 0.008) and daily caloric intake (0.012) while there is no significant correlation with other practices. A study done by Mohammad-Hossein revealed that there was a significant relationship between mothers level of education and the number of children they had with proper feeding practices. This finding explores the impact of education on increasing maternal knowledge and may change their behavior toward proper feeding practices.

Majority of mothers in this study had less than five feeding bottles and follow non-safe handling recommendations including washing their hands before formula preparation and bad sterilization technique of the bottles and teats (73.5%). A previous study demonstrated that 55% of mothers wash their hands with soap before preparing formula while another study done by Kassier et al showed that only 41.8% of mothers wash their hands with soap and water and 65.1% of them sterilize bottles with boiled water and that 84.6% of the bottle tested were contaminated. ON the other hand a study done by Lokare et al showed that bottles were washed in boiled water for hygiene purpose by 88.8% of participants mothers. Faulty sterilization technique and non-hygienic bottle handling carries a high risk of contamination that will further increase incidence of food borne infection and diarrhea especially among poor and low educated families.

This study revealed that 80.3% of mothers correctly reconstitute the infant formula milk while 19.7% giving dilute formula for better digestion and for prevention of vomiting as they believe. Similar to this finding, MacInture et al found that 82% of mothers correctly prepare infant formula. A systematic review of studies about mother experiences of bottle-feeding done by Rajalakshmi et al showed that 11 studies reported reconstitution errors (over and under concentration), while another study showed that the majority of mothers (87.5%) dilute the milk. The practices of infant feeding trends in a community play an important role in deciding the health and nutrition status of infants, giving dilute or concentrated milk by mothers or care givers carry a risk of under nutrition or obesity later in life. On the other hand the amount and the frequency of milk given per
day may be affected by cultural beliefs and practices that do not match the biological needs of the infant. Our study revealed that only 45.3% of mothers giving proper amount of milk per day and 65.2% of them giving average number of feeds per day. A study done by Tarrant RC et al showed that many infants consumed a considerably greater than recommended formula volume per kg/day\textsuperscript{13}. This may be explained that majority of mothers didn’t follow a proper schedule of feeding and they feed their infant when he cries, or they think that when a baby gets heavier is better.

The WHO recommends using boiled water in formula preparation\textsuperscript{9}. This study showed that only 22% of mothers used boiled tap water in preparing infant formula while 78% used non boiled bottled water. This finding is similar to another study that found mothers did not boil tap water (70%) or bottled water (83%) used to reconstitute formula\textsuperscript{12}. Another study showed that 72% of participants prepare formula with boiled water\textsuperscript{11}. This difference may reflect the underlying socioeconomic and educational status of the parents among a community.

An interesting finding in this study is the frequent change of formula feeding in 41% of the studied sample, in which 56% has been changed by doctors and 44% by mothers. Tarrant RC et al showed that there is a high frequency of formula type/brand changing evident among the study participant (49.2%)\textsuperscript{13}. Lakshman et al found that seven studies reported that mothers made frequent change to the type of formula feeds\textsuperscript{16}. Excessive formula marketing had led the health professionals, the non-baby friendly hospitals and mothers to frequently change formula type for various reasons like crying, regurgitation, and inadequate weight gain.

Limitation of this study is that our sample is hospital based, and there is a need for community based study for a better representation of feeding practices in the community.

**Conclusion**

The study concluded that there is low level of mother’s knowledge about formula-feeding in which the majority uses unsafe practices of feeding. The maternal knowledge is greatly influenced by culture and community beliefs rather than seeking a health professional advice.

**Recommendation**

It is important that every opportunity of contact of health personnel with care-givers be taken to counsel on infant feeding. Ensure all parents who have chosen to bottle-feed are shown how to sterilise bottle feeding equipment and ensure that they make up formula feeds safely before they leave hospital in line with national standards.

**Ethical Clearance:** Taken from the scientific committee of Al-Kindy College of Medicine and Al-Elwyia Pediatric Teaching Hospital

**Source of Funding:** self

**Conflict of Interest:** There is no conflict of interest.

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Monte Carlo Simulation to Estimate the Male and Female Effective Dose due to Radon exposure in Al-Najaf

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ABSTRACT

In this article, the concentrations of radon gas (²²²Rn) in some houses were measured at 10 sites in Al-Najaf city, using RAD-7 radon monitoring system. The effective doses for all samples were estimated using Monte Carlo method. The Visual Monte Carlo code was used to simulate the transport of the radiation as emitted from the ²²²Rn through the human voxel model. Room geometry of 3×3×4 m³ was designed to estimate the people radiation dose due to the exposure to the indoor radon. The latter doses were estimated for each of male and female people individually. It is found that the radon concentrations varied from (8.75 ± 1.1 Bq/m³) to (32.32 ± 4.0 Bq/m³) with an average (20.57 ± 2.90 Bq/m³). The resulted data of the Monte Carlo calculations for male reveal that the effective dose was ranged from 2.91E-05 to 1.07E-04 μSv/h while the female effective dose was noticed to range from 2.87875E-05 to 1.06333 E-04 μSv/h.

Keyword: ²²²Rn, Monte Carlo, effective dose, Al-Najaf city and RAD-7.

Introduction

Radon gas is a natural radioactive source and is chemically considered as an inert element. It originates from the natural decay of uranium 238 series, with atomic number 86 and mass number 222(1). The major contribution of radon exposure is attributed to indoor or household air(2). In this regards, many houses and buildings are built on top of radon emitting rocks. It should be noted that radon daughters are likely to attach to dust which would result in that people are exposed to them via breathing. However, the radon level in outdoor air is, to large extent, low at about 0.003 to 2.6 picocuries/liter of air. When considering the indoor exposure, such that at homes, schools, or offices buildings, the levels of radon and its daughters are generally higher than that of outdoor levels. Cracks exist in the foundation or basement of the homes can increase the level of the radon. This happens when the radon gas move through these cracks into home. In this context, at some areas of the country the amount of uranium and radium in rocks of different kinds, such as phosphate rock or granite, is high. In areas like these the radon levels in indoor air is generally expected to be high(3). The radon gas enters the houses from the ground via cracks present in concrete of the floors and walls, then through the gaps between floor and slab, around drains and pipes, and small pores of hollow-block walls. It is important to mention that radon levels usually high in places such as basements, cellars and ground floors. Based on certain factors, the concentration of radon in indoors changes considerably throughout the time of the year, from day to day, and from hour to hour(4,5). As reported in many countries, the radon is taking the second order of being the most important cause of lung cancer after smoking(6). Nevertheless, relevant studies in Europe, North America and China have also confirmed that even at lower concentrations of radon – such as those live in homes – also include health risks and contribute markedly to the occurrence of lung cancers worldwide(7,8). It has been reported that probability of lung cancer incidence can increases by 16% per 100 Bq/m³ of radon concentration increment. In this regards, the dose-response relation appears to be linear, this means that the lung cancer risk

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increases proportionally with increasing radon exposure. The level of the environmental radon is a function of time and climatic conditions. So, on order to monitor the radon level, active and passive techniques can be used. Active method often used for short-term measurements of radon. By contrast, passive method could be suitable for the assessment of radon exposure over long period of time. This enables it to be used for large-scale surveys at a low cost\(^9\). In active measurement, in general, radon and its decay products are brought either into the vicinity of a detector or into a collector device via forced pumping, while in passive measurements, radon and its decay products are collected through their natural diffusion (or permeation) into the device, containing a detector. The terms active and passive are also used to differentiate those radiation detectors that operate with and without power supply. However, estimation of the amount of dose received by tissues/organs of the body that exposed to radiation source in an environmental medium is an extremely difficult computational task\(^{10}\). Therefore, Visual Monte Carlo (VMC) is computerized software that simulates the human body irradiation by an external source of radiation. It uses a voxel phantom designed at Yale University and the Monte Carlo method to simulate the emission of photons by a point, ground, cloud source as well as X-ray source. It therefore simulates the transportation of the photons through the phantom of the human body and estimates the dose to all body regions\(^{11}\). Consequently, this permits the estimation of the effective dose. The aim of the present work is to measure the radon concentrations in some houses of Al-Najaf area. Also by using Monte Carlo method the estimates for the effective dose can be provided for both male and female voxel phantoms/models.

**Materials and Method**

Najaf city situated between coordinates of latitudes of 32°21’N and 29°50’N, coordinates of longitudes of 44°44’E and 42°50’E with a total area of 28,824 km\(^2\) (6.6% of Iraq whole area)\(^{12}\). Al-Najaf city, considering the administrative side, includes three qadhas (administrative units consisting of the governorate, Al-Manatheria, Al-Kufa and Al-Najaf Qadhas). In the current study, ten sites were selected as fair distribution in Al-Najaf city.

The RAD-7 is a device that provides a real-time and continuous monitoring for radon. The latter would help in observing the variations occur within the radon concentration levels during the measurement period. This might be effective, in turn; in the case that one can check the factors that impacting the radon levels throughout time. To illustrate, these factors may include temperature variation, wind speed, humidity (relative). This could give an insight into movements of the air inside a room\(^{13}\). The RAD-7 includes an internal standard sample cell at around 0.7 liter and has a hemispherical shape as can be observed in Figure (1). The inner side of the hemisphere is coated with an electrical conductor that can be changed, with a high power supply, to a potential difference range of about 2000-2500 Volts relative to the detector. This in turn creates an electrical field across the cell. The latter electric field drives the positively charged particles into the detector in the periodic-fill cell.

![Fig. 1: Schematic diagram of the RAD-7 detector\(^{14}\)](image)

The method which was adopted to collect the samples can be described as follows: Four samples for the house air were taken from each region. The number of air samples that considered in this work was forty. The sniff mode and circle time was set at 1 hour in accordance with running time of each path of the valve. In order to investigate the amount of radon released from the sample to air, the samples were enclosed into a column, and an airborne radon/thoron was measured with a continuous monitor of electrostatic type (RAD-7, Durridge Company, and USA). The flow rate of the air was 0.7 L min\(^{-1}\). The air of the room was drawn from the, and the radon generated in the air flow system was measured using the RAD-7 device.

The concentration of radon in the inside cell of RAD7 is calculated by the following equation\(^{15}\):

\[
\frac{dU(t)}{dt} = -\lambda U(t)
\]
\[
\frac{d\lambda_{Po}}{dt} = \lambda_{Po} U(t) - \lambda_{Po} U_{Po}(t) \quad \ldots 2
\]

where \( U(t) \) represents the concentration of radon in the RAD7 internal cell, \( \lambda \) is the radon decay constant, \( U_{Po}(t) \) is a concentration of \(^{218}\)Po, and \( \lambda_{Po} \) is decay constant of \(^{218}\)Po and equals to 0.0037s\(^{-1}\).

Once the pumping time has elapsed, the concentration of radon in the inside cell of RAD7 equals that of the environment Co. Equation 2 can be rewritten as

\[
\frac{dU_{Po}}{dt} = \lambda_{Po} U_{o} - \lambda_{Po} U_{Po}(t) \quad \ldots 3
\]

The initial condition is \( U_{Po}(0) = 0 \) \ldots 4

The solution of Eq. (4) is

\[
U_{Po}(t) = U_{o}(1 - e^{-\lambda_{Po}t}) \quad \ldots 5
\]

When the time is much longer than that of the half-life of \(^{218}\)Po, Equation 5 then can be rewritten as (3).

\[
U_{Po}(t) = U_{o} \quad \ldots 6
\]

The concentration of radon can be calculated using Equation 6, and this is the measurement principle of RAD-7. The RAD-7 utilizes a high electric field over a silicon semiconductor at a ground potential to catch the heavy charged of the polonium daughters, \(^{218}\)Po (\( t_{1/2} = 3.1 \text{ min; } = 6.00 \text{ MeV} \)) and \(^{214}\)Po (\( t_{1/2} = 164 \text{ ms; } = E_{a} \text{ 7.67 MeV} \)), which are estimated in sample as a measure of \(^{222}\)Rn activity concentration., the RAD7 prints out a summary of the average radon reading at the end of each run (about 30 min for each run). The time required for the process of collecting and analyzing the sample is corrected using equation (3):

\[
U = U_{o}e^{-\lambda t} \quad \ldots 7
\]

where \( U \) is the recorded concentration, \( U_{o} \) calculates primary concentration next to the decay corrections and \( t \) is the elapsed time until collection in day unit, \( \lambda = 0.181, \ t_{1/2} = 3.83 \text{ days.} \)

**VMC Validation:** This VMC program was written in the Instituto de Radioproteção e Dosimetria for simulating the radiation transport via specific voxel model. Basically, this program was written using visual basic, and can be applied to both internal and external dose calculations resulted from photons\(^{(16)}\). The program was later extended to include alpha particle, electron and proton transport through a specified voxel structure. To investigate the validity of this software, it has previously been benchmarked via comparisons with many other models and Monte Carlo software\(^{(17)}\). The results of these validation attempts show a good agreement for the effective dose due to cloud immersion obtained using VMC and Federal Guidance Report No.12. In this paper, the program provides coefficients that based on the Monte Carlo simulation to calculate both the organ and effective dose as a result of radiation exposure.

**Results and Discussion**

The resulted data concerning the level of radon concentrations in houses air and for the 10 sires at Al-Najaf are presented in Table (1). According to Table (1), it can be seen that radon concentrations were varied from (8.75 ± 1.1 Bq/m\(^3\)) in location (N10 sample) to (32.32 ± 4.0 Bq/m\(^3\)) in location (N1 sample) with an average value (20.57 ± 2.90 Bq/m\(^3\)). The variations of radon concentrations which were seen among different regions can be caused by a number of factors. These include things like the geological structure of the sites, different kinds of building materials that used to construct houses, the heating systems together with ventilation level, the aging effect on the building and the social habits of the dwellers. The maximum value of \(^{222}\)Rn concentrations in present study is which is much lower than the recommended ICRP indoor of (200-400) Bq/m\(^3\). Comparing these results with those of the Arabic countries it was found that the range of average radon concentration in Jordan (west of Iraq) building measured is (9.95 – 68.15) Bq/m\(^3\) and in Egypt particularly in some region, the average radon concentration in air of buildings was reported to be about 79.505 Bq/m\(^3\) in range from (38.62-120.39)Bq/m\(^3\).

**Table 1: Results of Radon Concentrations**

<table>
<thead>
<tr>
<th>No.</th>
<th>Study Site</th>
<th>Location Sample</th>
<th>(^{222})Rn Concentrations</th>
<th>Mean</th>
<th>± Standard Error</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Missan</td>
<td>N1</td>
<td>32.32</td>
<td>4.0</td>
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<tr>
<td>2.</td>
<td>Asskry Kufa</td>
<td>N2</td>
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</tr>
<tr>
<td>3.</td>
<td>Mutnabi</td>
<td>N3</td>
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<td>3.5</td>
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<tr>
<td>4.</td>
<td>Jmohria</td>
<td>N4</td>
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<tr>
<td>5.</td>
<td>Tmoz</td>
<td>N5</td>
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<tr>
<td>6.</td>
<td>Sraai</td>
<td>N6</td>
<td>28.28</td>
<td>3.5</td>
<td></td>
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<tr>
<td>7.</td>
<td>Addalh</td>
<td>N7</td>
<td>9.09</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>
Effective Dose: The results of the Monte Carlo simulation which was conducted for the room geometry that mentioned above to calculate the effective dose for human exposed to radon at indoor are presented in the Table 2 and 3 for each of the male and female respectively.

Table 2: The male effective dose estimated at room geometry of 3*3*4 m³

<table>
<thead>
<tr>
<th>Location Sample</th>
<th>Bq/m³</th>
<th>Male effective dose (μSv/h)</th>
</tr>
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<tbody>
<tr>
<td>N1</td>
<td>32.32</td>
<td>1.07E-04</td>
</tr>
<tr>
<td>N2</td>
<td>28.26</td>
<td>9.38E-05</td>
</tr>
<tr>
<td>N3</td>
<td>27.95</td>
<td>9.28E-05</td>
</tr>
<tr>
<td>N4</td>
<td>11.78</td>
<td>3.91E-05</td>
</tr>
<tr>
<td>N5</td>
<td>17.17</td>
<td>5.70E-05</td>
</tr>
<tr>
<td>N6</td>
<td>28.28</td>
<td>9.39E-05</td>
</tr>
<tr>
<td>N7</td>
<td>9.09</td>
<td>3.02E-05</td>
</tr>
<tr>
<td>N8</td>
<td>14.48</td>
<td>4.81E-05</td>
</tr>
<tr>
<td>N9</td>
<td>27.27</td>
<td>9.05E-05</td>
</tr>
<tr>
<td>N10</td>
<td>8.75</td>
<td>2.91E-05</td>
</tr>
</tbody>
</table>

Table 3: The female effective dose estimated at room geometry of 3*3*4 m³

<table>
<thead>
<tr>
<th>Location Sample</th>
<th>Bq/m³</th>
<th>Female effective dose (μSv/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>32.32</td>
<td>1.06333E-04</td>
</tr>
<tr>
<td>N2</td>
<td>28.26</td>
<td>9.29754E-05</td>
</tr>
<tr>
<td>N3</td>
<td>27.95</td>
<td>9.19555E-05</td>
</tr>
<tr>
<td>N4</td>
<td>11.78</td>
<td>3.87562E-05</td>
</tr>
<tr>
<td>N5</td>
<td>17.17</td>
<td>5.64893E-05</td>
</tr>
<tr>
<td>N6</td>
<td>28.28</td>
<td>9.30412E-05</td>
</tr>
<tr>
<td>N7</td>
<td>9.09</td>
<td>2.99061E-05</td>
</tr>
<tr>
<td>N8</td>
<td>14.48</td>
<td>4.76392E-05</td>
</tr>
<tr>
<td>N9</td>
<td>27.27</td>
<td>8.97183E-05</td>
</tr>
<tr>
<td>N10</td>
<td>8.75</td>
<td>2.87875E-05</td>
</tr>
</tbody>
</table>

According to the above Tables (2 and 3), it is clear that for male the highest effective dose was noticed to be at Missan site with a value of 1.07E-04 μSv/h whereas the lowest was found to be at Milad site with an effective dose of 2.91E-05 μSv/h. By contrast, when considering the female effective dose, the highest was 0.000106333 at Miasan site and the lowest was at Milad with an effective dose of 2.87875E-05 μSv/h. The reasons behind the above fluctuations in the value of dose can be attributed to the level of radon detected in these sites (see Table 1). Also, it should be mentioned that Missan site as a one of the new neighborhoods in Najaf city is undergoing a marked wave and building using different materials that could arise the level of radon. The rest of the sites reveal different levels of radon and therefore exhibit different radiation absorbed dose.

Conclusions

According the results of the current work, the following conclusions can attained: all the findings of radon concentrations were obtained in this study were less than the allowed level. The highest people effective dose whether for male or female was found to be at Missan Neighborhood of Al Najaf city.

Conflict of Interest: There are no conflict interest.

Source of Funding: The authors declare that they have no competing interests.

Ethical Clearance: All authors are in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5).

REFERENCE

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18. ICRP, against Radon IP. 222 at Home and at Work. ICRP publication. 1993;65.


Detection of Dioxin in the Packed Tea Bags that Available in the Local Markets

Aliaa Saadoon Abdul-Razaq Al-Faraji
Department of Commodity Evaluation and Service Performance, Market Research and Consumer Protection Center, University of Baghdad, Iraq.

ABSTRACT
This study was performed to examine the existence of Dioxin in packed black and green tea bags, that being imported from Arabic and international manufacturers available in the local Markets, (10) kinds of tea bag from (UAE, Syria, Sri Lanka) were bought randomly from Baghdad city markets, The results showed that all samples doesn’t include within it Dioxin, so we insure their safety for consumption and these tea bags specifications are satisfied the standard specifications and technical regulations, and accordingly we deny the rumors that say the tea bags are one of the important causes of cancer.

Keywords: Dioxin, packed tea bag, GC-mass.

Introduction
Dioxin is considered the troublemaker companion in all chemical processing and industries. It is found in the Herbal Pesticides, plastic industry, paper industry, in the furnaces that process the plastic garbage chlorinated in hospitals and all the traditional usage of the chlorine such as: Operations for bleaching and sterilization. Dioxin is considered to be an organic matter of hydrocarbons which is of many chemical derivatives up to 420 organics known as Isomers and they are all similar in effect, it includes: dioxin, Furans and PCBs. The worst kind of which is 2,3,7,8- tetrachlorobenzo (TCDD) P-dioxin. This kind characterized by receptors within the cell in the nucleus of animals, humans and the food chain, that it is found in water, air, soil, and food. Finally, it gets into the muscles easily where it centralizes in the cells of DNA and begin to destroy, if it damages DNA, it may so cause cancer or deform the fetus. It may also change the DNA directions to build enzymes, natural hormones and other proteins that can lead to many sicknesses which harm the health and has massive risks. Recently, such a kind of compound was common in the tea bags and it causes cancer and infertility, so, the study aimed to reveal the dioxin in tea bags to investigate it and determine its suitability for consumption.

Materials and Method
Gathering the Samples: Ten 10 samples of tea bags from different local markets in Baghdad as shown in table 1.

Tea solution was prepared by emptying the tea bags and boiling them with non ionic distilled water in a beaker and filter it and prepare it for measurement.

Detecting Dioxin: The devices: GC-Mass Agilent 5977 E.MSD and GC (oven) were used by using different temperatures and a line type (HP5MS 30 µm*250 µm*0.5 µm) and flow rate 1.1ml/min and injecting a model of the sample 2.5µl, then measurements were taken.
### Results and Discussion

The table no. 2 results showed that all tea bags samples were free of dioxin and it contains only caffeine and the natural components of tea. And so it is fit for human consumption and removes the doubt of not using them and Denies that it causes cancer and infertility, because dioxin is considered an element that exists in the human food and the food chain and it exists in the food chain, it exists in the water and air and soil and helps to connect with the DNA causing damage of the natural enzymes and hormones and proteins and increase above the natural limits causes different diseases and cancers.

### Table 2: Shows the concentration of dioxin in filled tea bags:

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Trademark</th>
<th>Dixon concentration PPm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ahmed tea in Cardamom flavor</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>Mahmood tea in Cardamom flavor</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>Mahmood tea Black Ceylonetea</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td>Mahmood tea Green tea</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>Mahmood tea Green tea in Cardamom flavor</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td>Mahmood tea Green tea with lemon</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>Ahsan tea Ceylon tea with cardamom</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td>Al-Wazzah tea Ceylon tea</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td>Lipton tea bags</td>
<td>0.00</td>
</tr>
<tr>
<td>10</td>
<td>Lipton tea yellow mark</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Conclusions

Results of this study indicated that Dioxin not found in all samples of tea bags, so we insure their safety for consumption and all of these samples specification are satisfied the standard specifications and not causes cancer and infertility.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.
REFERENCES


Effect of High Intensity Training on Blood Measurements for Young Volleyball Players

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ABSTRACT
The importance of the research is to improve the functional aspect of volleyball players through the use of appropriate training method, which works to build and adapt the appropriate function, including blood components, in addition to the receipt of scientific information for trainers about the role of this training, the high severity on the components of blood has applied in a manner that suits the privacy of the game of the ball of the plane.

The objectives of this research are to prepare of high-intensity training on some blood measurements for young volleyball players, identification of the effect of high intensity training on some blood measurements for young volleyball players.

This study concluded that, training of high-intensity fetus is of high significance in increasing blood components under the study (number of red blood cells (million/mm 3), Percentage of hemoglobin in mg (%), Number of white blood cells (Thousand/mm3), Number of thrombocytopenia (Thousand/mm 3)). Also, high physical load of severity gives great benefits in the components of blood, which is the most important functional component of the body functions to transfer energy and waste to and from the working muscles.

Keywords: Volleyball players High-intensity training Blood measurements

Introduction
This scientific output is adopted by the scientific scholars of the country, in all its various fields, including sports. Therefore, the developed countries are the owners of high athletic achievements and prosperity in sports on all their needs from the infrastructure to establish the stadiums and in terms of health interest of citizens and sports as well as building the base of heroes from the National teams of specialized schools.

Therefore, the training of the fetus, especially the high intensity has a direct impact of the high stress it affects the adaptation of the functional body of the player if treated with the correct scientific method.

The first effect is on the blood and its components as the first functional factor, which stimulates the rest of the functions of work and adaptation of the transport of food and oxidation and irregularities within the body.

Hence, the importance of research is to improve the functional aspect of volleyball players through the use of the appropriate training method, which works on building and adapting the appropriate function, including blood components, in addition to the delivery of scientific information to trainers about the role of this high frequency training on the blood components has to be applied in a manner that suits the privacy of the Volleyball game.

Blood and its components have a direct effect in giving an indication of the adaptation of the functional player, especially when developing for the better being the main factor for the transfer of nutrients to the working muscles and the transfer of waste from outside the body.

Therefore, the use of appropriate scientific training will be a crucial component for upgrading the player and for achieving good results.
Thus, the researcher decided to study this problem by identifying the effect of high intensity training on some blood measurements for young volleyball players. (9, 10, 11).

**Materials and Method**

**A. Research Hypothesis**

1. There are significant differences between the results of tests tribal and remote and in favor of remote tests on some blood measurements of young volleyball players.

2. There are significant differences between the control groups and the experimental groups and for the benefits of the experimental group on some blood measurements for young volleyball players.

**B. Research Areas:**

1. **Human Field:** Players of the advanced volleyball team/Faculty of Basic Education/University of Diyala.

2. **Spatial Field:** The Faculty of Basic Education/University of Diyala and the Shams Laboratory for Pathological Analysis in Baquba Al-Jadida Al-Tabu Street.

3. **Time Zone:** Duration from 2/12/2018 to 12/2/2019.

**C. Theoretical Studies:**

1. **Periodic Training:** The periodic training is characterized by regular exchange between pregnancy and the rest is incomplete and takes into account the use of this method to start the recurrence of pregnancy after the rest period when the arrival of the pulse is to the limits of (120-130) bpm, the range of comfort is incomplete. To the interval between each exercise and the next exercise. In this way, the exercise time, duration, rest shape is used, and number of repetitions are considered. Based on the specifications of these variables, the reaction level is determined for the internal devices.

**D. This method has been divided into two types:**

1. Low-intensity periodic training.

2. High-intensity periodic training.

**High-Intensity Periodic Training:** In this way, that the training is carried out in such a way which is characterized by high intensity and little repetition. The muscles of the body perform with insufficient oxygen due to the intensity of pregnancy, i.e. the occurrence of so-called (oxygen debt). The aim of using this method is to improve the level of anaerobic tolerance (The adaptation of the devices) under the conditions of effort with the debt of oxygen”2”. The characteristics of training in this way that the intensity of exercise goes to high ranges between (80-90%) of the maximum level of the individual, and exercise with additional weights reach about 75% of the maximum capacity of the individual. This is confirmed by Mufti Ibrahim (3).

As for size, Mohammed Othman (7) and Abdullah Al-Lami “5” mentioned that the exercise is repeated 10-12 times and can be repeated in 3-4 groups. The Interval periods are enhanced by increased intensity of exercise and incomplete rest periods to allow the heart to return to normal part of the body. Mohammed Hassan Allawi mentioned it (15). The rest period ranges between 90-180 seconds for advanced players, with no heart rate falling to 110-120 bpm. The use of the principle of positive rest in the interstellar rest periods, such as; walking and relaxation exercises.

**E. Procedures:**

1. **Design:** The researcher used the experimental method with the sample of the controlled groups and the experimental groups to suit the solution of the research problem and achieve its objectives.

2. **Sampling:** The research community defines in a deliberate way for players of the volleyball team of applicants in the College of Basic Education/University of Diyala and the number of (20) players. After that, 12 players were selected from the main team, who continued the training and their participation in the tournaments. The sample was randomly divided into two controlled and experimental groups, so that the number of each group was 6 players and the sample formed 60% of the original society.

The sample was homogenized within the group using the difference of coefficient and the equivalence of the two groups using the (t) test as in Table (1).
## Table 1: Demonstrate the Homogeneity and Equivalence of the Controlled and Experimental Groups

<table>
<thead>
<tr>
<th>t</th>
<th>Measurements</th>
<th>Controlled group</th>
<th>The experimental group</th>
<th>Calculated t-value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>Coefficient of variation</td>
<td>M</td>
</tr>
<tr>
<td>1</td>
<td>Length/cm</td>
<td>175.22</td>
<td>3.51</td>
<td>2.003</td>
<td>175.37</td>
</tr>
<tr>
<td>2</td>
<td>Weight/kg</td>
<td>81.26</td>
<td>1.79</td>
<td>2.202</td>
<td>82.26</td>
</tr>
<tr>
<td>3</td>
<td>Number of red blood cells million/mm³</td>
<td>4.524</td>
<td>0.356</td>
<td>7.869</td>
<td>4.442</td>
</tr>
<tr>
<td>4</td>
<td>Hemoglobin ratio mg%</td>
<td>13.158</td>
<td>0.646</td>
<td>4.909</td>
<td>13.052</td>
</tr>
<tr>
<td>5</td>
<td>Number of white blood cells thousand/mm³</td>
<td>6.625</td>
<td>0.552</td>
<td>8.332</td>
<td>6.455</td>
</tr>
<tr>
<td>6</td>
<td>Number of thrombocytopenia thousand/mm³</td>
<td>205.155</td>
<td>2.137</td>
<td>1.041</td>
<td>205.456</td>
</tr>
</tbody>
</table>

The Schedule (t) Value at the Freedom Level (10) and the Level (0.05) = 1.812

### F. Information gathering Methods:

#### 1 Means of Data Collection:

1. Arabic references.
2. Exploration experience.
3. Measurements used.

#### 2. Instruments and Tools used:

1. Needle to draw blood samples.
2. Bottles to save blood samples.
3. Centrifuge
4. Cool Box to save blood samples with all requirements for obtaining ratios.
5. Six (6) Volleyballs.
7. Regulated volleyball playground.
8. Metric tape measure.

#### 3. Procedures

#### 1. Determining Research Variables: Based on the modest experience of the researchers and review of sources and references, the blood variables and their components were determined by the researcher as necessary:

- Number of red blood cells (million/mm³)
- Hemoglobin ratio (mg%)
- Number of white blood cells (thousand/mm³)
- Number of thrombocytopenia (thousand/mm³)

#### G. Exploration Experience: The researcher conducted an exploration experiment on 2/12/2018 on the same research samples. The required training was applied for the purpose of rationing the training load used according to the high periodic training method and preparing the measurements required for measurement, and the purpose of the experiment was to:

1. Know the required tools.
2. Know the right time.
3. Know the obstacles facing the researcher in the future.
4. The regulation of exercises and the calculation of the appropriate size by the quality of training high intensity and low intensity.

#### H. Measurements Used:

1. Anthropometric measurements (length - weight).
2. Measurements of blood components (number of red blood cells million/mm³, hemoglobin ratio mg%, number of white blood cells thousand/mm³, number of thrombocytopenia thousand/mm³).
1. Method of Measurements: The pre-measurements of the blood parameters and their components were performed inside the playground and transferred to a laboratory. The blood sample was withdrawn by 5cc after sitting the testers for 5 minutes. After the procedure, the blood was drawn into a glass box that placed the blood in a special box called cool box and then transferred to a laboratory to obtain the results for the variables. The two-stage blood draw was included:

First: During the Rest:
1. Measurement of the pulse rate and blood pressure measurement for the research sample at the time of rest.
2. (5cc) Blood was drawn to the sample of the research for each player.

Second: during During the Effort:
1. Application of a specialized training unit.
2. Increase the load after one minute by repetition and difficulty exercises.
3. Continue to increase the load until the intensity of (100%) by measuring the maximum pulse (180-190 bpm).

I. Field Experience:

Pre-measurement: The pre-measurement was performed on 16/12/2018.

Main Experience and Training: The exercises were implemented in the main section of the trainer’s training units during the special number period at a rate of (3) units per week and for two months (24) training units.

The size of the load was determined according to the intensity set. The rest was based on pulse return (120-130 bpm) and time was calculated to rest during the pulse. The application of the exercises was for the period from 17/12/2018 to 11/2/2019.

Post-measurement: The post-measurement was performed on 12/2/2019.

J. Statistical Methods: Using the (SPSS) system in statistical treatments and to find the following:
1. Arithmetic mean.
2. Standard deviation.
3. The difference coefficient.
4. Test (T) for interrelated samples.
5. Test (T) for independent samples.
6. Percentage.

Results and Discussion

By noting Table (2) and Table (3), it was found that there are significant differences in the controlled groups and the experimental groups in pre and post measurements. This is an evidence of improvement in the physiological variables under the study, including blood and its components, which is due to the training used and have positive impact as a result of the regularity of the sample training and the use of additional loads of the set and this is consistent with the statement of Karima Ahmed Fattouh, (5) “The regularity in the training program lead to the creation of some physiological variables of the body as a manifestation of adaptation to the nature of that activity” (1, 10, 11, 18, 19).

Regardless of the type of training used by the control or the experimental group, adaptations occur for all components of the body, including blood. “It is the process of adaptation of the system that begins with physical pregnancy leading to internal imbalance by depleting energy and increasing capacity and function” (16, 17, 18).

Table 4 showed differences between the controlled and the experimental groups and for the benefit of the experimental group, which the researcher considered to be due to the high-intensity infant training used as a high-load method that interacts with the exchange between pregnancy and rest. In a previous study, rest and regular exercise have health benefits and stress the balance between oxidative stress and antioxidant enzymes“3”.

As for the effect of training on blood components, it is natural that there is a significant impact on blood training, as Kamal Abdul Hamid (4) contended that, “physical exertion increases the number of red blood cells.. As the researcher saw that, the increase in blood components, including red blood cells and hemoglobin to the size of the pregnancy used and affecting the body and adapting, as Qassem Hassan Hussein (2) stated that “The practice of sports training for a certain period leads to the adaptation of blood for the performance of physical training, in blood volume and hemoglobin and erythrocyte volumes” (11, 12, 13).
Table 2: Shows the Pre/Post (t) Values of the Controlled Group

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Pre</th>
<th>Post</th>
<th>The standard error</th>
<th>Calculated t-value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of red blood cells million/mm³</td>
<td>4.524</td>
<td>4.88</td>
<td>0.03</td>
<td>0.12</td>
<td>3.56</td>
</tr>
<tr>
<td></td>
<td>0.356</td>
<td>0.03</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
<tr>
<td>Hemoglobin ratio mg%</td>
<td>13.158</td>
<td>13.648</td>
<td>0.224</td>
<td>0.171</td>
<td>2.865</td>
</tr>
<tr>
<td></td>
<td>0.646</td>
<td>0.224</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
<tr>
<td>Number of white blood cells thousand/mm³</td>
<td>6.625</td>
<td>7.891</td>
<td>0.265</td>
<td>0.445</td>
<td>2.844</td>
</tr>
<tr>
<td></td>
<td>0.552</td>
<td>0.265</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
<tr>
<td>Number of thrombocytopenia thousand/mm³</td>
<td>205.155</td>
<td>211.256</td>
<td>2.361</td>
<td>1.786</td>
<td>3.416</td>
</tr>
<tr>
<td></td>
<td>2.137</td>
<td>2.361</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
</tbody>
</table>

The Schedule (t) Value at the Freedom Level (5) and under the Level (0.05) = 2.015

Table 3: Shows the Pre/Post (t) Values of the Experimental Group

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Pre</th>
<th>Post</th>
<th>The standard error</th>
<th>Calculated t-value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of red blood cells million/mm³</td>
<td>4.442</td>
<td>4.998</td>
<td>0.26</td>
<td>0.211</td>
<td>2.635</td>
</tr>
<tr>
<td></td>
<td>0.312</td>
<td>0.26</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
<tr>
<td>Hemoglobin ratio mg%</td>
<td>13.052</td>
<td>13.998</td>
<td>0.16</td>
<td>0.278</td>
<td>3.402</td>
</tr>
<tr>
<td></td>
<td>0.256</td>
<td>0.16</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
<tr>
<td>Number of white blood cells thousand/mm³</td>
<td>6.455</td>
<td>8.445</td>
<td>0.27</td>
<td>0.388</td>
<td>5.128</td>
</tr>
<tr>
<td></td>
<td>0.441</td>
<td>0.27</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
<tr>
<td>Number of thrombocytopenia thousand/mm³</td>
<td>205.456</td>
<td>215.662</td>
<td>2.177</td>
<td>2.99</td>
<td>3.413</td>
</tr>
<tr>
<td></td>
<td>2.148</td>
<td>2.177</td>
<td></td>
<td></td>
<td>significant</td>
</tr>
</tbody>
</table>

The Schedule (t) value at the freedom level (5) and under the level (0.05) = 2.015

Table 4: Shows the Post (t) Values between the Two Groups (Controlled & Experimental) Groups

<table>
<thead>
<tr>
<th>T</th>
<th>Measurements</th>
<th>Controlled group</th>
<th>Experimental group</th>
<th>Calculated t-value</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of red blood cells million/mm³</td>
<td>4.88   0.03</td>
<td>4.998  0.05</td>
<td>5.9</td>
<td>significant</td>
</tr>
<tr>
<td>2</td>
<td>Hemoglobin ratio mg%</td>
<td>13.648 0.224</td>
<td>13.998 0.16</td>
<td>2.845</td>
<td>significant</td>
</tr>
<tr>
<td>3</td>
<td>Number of white blood cells thousand/mm³</td>
<td>7.891  0.265</td>
<td>8.445 0.27</td>
<td>3.278</td>
<td>significant</td>
</tr>
<tr>
<td>4</td>
<td>Number of thrombocytopenia thousand/mm³</td>
<td>211.256 2.361</td>
<td>215.662 2.177</td>
<td>2.885</td>
<td>significant</td>
</tr>
</tbody>
</table>

The Schedule (t) Value at the Freedom Level (10) and under the Level (0.05) = 1.812

Our study concluded that, the periodic training of the high-intensity is of high significance in increasing blood components under the study (number of red blood cells million/mm³, hemoglobin ratio mg%, number of white blood cells thousand/mm³, number of thrombocytopenia thousand/mm³). Also, high-intensity physical loads give great benefits to the blood components, which is the most important functional component in the body’s functions to transfer energy and waste to and from the working muscles.

Also, our study recommended that, relying on the periodic training of the high-intensity, as it is especially important in increasing blood components.
under the study (number of red blood cells million/mm³, hemoglobin ratio mg%, number of white blood cells thousand/mm³, number of thrombocytopenia thousand/mm³). Also, the need to emphasize the use of high loads of physical strength because it provides great efficiencies in the blood components, which is the most important functional component of the functions of the body to transfer energy and waste to and from the working muscles. Also, conducting periodic laboratory tests at various levels for their benefits to their health and to continue to develop their levels.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

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Use of Anti-Dyslipidemia in Type 2 Diabetes Mellitus

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ABSTRACT

Background: Dyslipidemia is one of the most common conditions in type 2 diabetes mellitus patients. Use of anti-dyslipidemia needs to be studied because it can cause improper therapy and drug-related problems that affect patient management.

Objective: To study the use of anti-dyslipidemia in type 2 diabetes mellitus

Method: The study was descriptive retrospective study with medical record of type 2 DM patients with dyslipidemia. Inclusion criteria were patient who was diagnosed with type 2 DM with dyslipidemia; received anti-dyslipidemia therapy; ≥20-year old male or female; and had a complete medical record. Sampling used time-limited sampling method. Data were analyzed descriptively.

Result: Patients who met inclusion criteria were 390 people. The most commonly found laboratory data was LDL value (96.41%). The mostly used anti-dyslipidemia therapy was HMG-CoA reductase inhibitors and fibrate. This study found potential DRP (drug interaction, drug reaction, and therapy suitability) and actual DRP (drug side effects). In therapeutic response, there were still many patients who did not reach the expected lipid level. This showed that controlling lipid levels in patients with type 2 DM is difficult. Management of anti-dyslipidemia was not only pharmacological therapy but could also be balanced with non-pharmacological therapy to prevent other risk factors development.

Conclusion: Use of anti-dyslipidemia therapy in type 2 DM patients in outpatient care unit was in accordance with existing guidelines, but the therapeutic response was not in accordance with the goals of therapy.

Keywords: Type 2 diabetes mellitus, dyslipidemia, anti-dyslipidemia drug

Introduction

Diabetes Mellitus (DM) is a metabolic disorder illness characterized by hyperglycemia. Metabolic disorder in DM patient that causes hyperglycemia is caused by insulin secretion disorder, insulin sensitivity, or both that can relate to many organ disfunction. ¹ ² Classifications of DM according to American Diabetes Association are type 1 diabetes mellitus, type 2 diabetes mellitus, gestational diabetes mellitus, and specific types of diabetes due to other causes. People with DM increase each year; mainly type 2 DM. Based on WHO¹ diabetes global prevalence has increased from 4.7% in 1980 to 8.5% in 2014. Over the past decade, prevalence has increased more in low and middle-income countries than high-income countries. Proportion of undiagnosed type 2 DM varies greatly; a recent review of data from seven countries has found that between 24% and 62% of people with diabetes are undiagnosed and untreated.

Characteristics of type 2 DM are insulin resistance and reduced insulin secretion. Both of these can be caused by age factors, dyslipidemia, hypertension and genetics. Dyslipidemia is one condition that always accompanies type 2 DM patients. Dyslipidemia is defined as an abnormal lipid level. Diabetic dyslipidemia is characterized by decreased levels of high-density lipoprotein (HDL), increased low-density lipoprotein

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(LDL) and triglycerides (TG). Dyslipidemia in type 2 DM patient is caused by insulin resistance causing an increased plasma insulin and β cell depletion which results in circulatory disorders of lipoprotein and glucose so it causes abnormal plasma lipids.\textsuperscript{1,2,4,5}

Complications that can occur in type 2 DM patients with dyslipidemia are cardiovascular disease, cerebrovascular disease, Cerebro Vascular Disease (CVD), peripheral vascular disease, atherosclerosis, and death. Controlling lipid level in type 2 DM patient can be done with lifestyle interventions. Along with many failures of lifestyle interventions therapy, pharmacological therapy is used to achieve therapy target. The drugs used in therapy to reduce lipid level are HMG CoA reductase inhibitors (statins), bile acid sequestrans resins/BAR (cholestiramine and cholestipol), nicotinic acid (niacin), fibrates (gemfibrozil, fenofibrate), and absorption inhibitors bowel cholesterol (ezetimibe).\textsuperscript{1,6–9} Giving anti-dyslipidemia therapy in type 2 DM patient must be accurate by paying attention to the patient’s condition based on clinical and laboratory data and treatment options.

The use of anti-dyslipidemia needs to be studied because it can lead to improper therapy and potential drug-related problems that affect patient management, so an observational study is conducted to examine the use of anti-dislipidemia in type 2 DM patients.

**Method**

This research was descriptive retrospective study. Research data used medical record of type 2 DM patient with dyslipidemia who received anti-dyslipidemia therapy in outpatient care unit of Airlangga University Hospital (RSUA) Indonesia. Inclusion criteria of sample were patient who was diagnosed with type 2 DM with dyslipidemia; received anti-dyslipidemia therapy; ≥20-year old male or female; and had a complete medical record. Then, exclusion criterion of sample was patient who visited <2 times. Sampling used time-limited sampling method. Sampling was carried out in January 2014 - June 2016. Observed variables were age, gender, clinical symptoms, comorbid diseases and complications, type of anti-dyslipidemia, dose, route of administration, frequency of administration, laboratory data, and therapeutic response. Data were analyzed based on patient’s medical record. Data that were obtained from data collection sheet were entered into parent table then they were processed and analyzed descriptively into tables and narratives.

**Results**

Research resulted 390 patients who met the inclusion criteria and were dominated by female (58.46%). Patients were dominated by the age group 45-64 years old (68.97%). The three highest clinical symptoms experienced by type 2 DM patients with dyslipidemia were whole body pain (5.90%), tingling (2.82%) and headache (2.82%). The rest of clinical symptoms were thick extremity, airway disorders, knee pain, swollen feet, polyuria, and nausea and vomiting.

**Comorbid Profile:** The most common comorbid disease can be seen in the table below:

**Table 1: Comorbid disease and complication in Type 2 DM Patient with Dyslipidemia**

<table>
<thead>
<tr>
<th>Comorbid Disease and Complications</th>
<th>Number of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>195</td>
<td>50,00</td>
</tr>
<tr>
<td>Bone and joint disorders</td>
<td>92</td>
<td>23,59</td>
</tr>
<tr>
<td>Diabetic nephropathy</td>
<td>41</td>
<td>10,51</td>
</tr>
<tr>
<td>GIT disorders (dyspepsia, GERD, AGE, Gastropathy)</td>
<td>20</td>
<td>5,13</td>
</tr>
<tr>
<td>Neuropathy</td>
<td>20</td>
<td>5,13</td>
</tr>
<tr>
<td>HHF, HHD, DCFC</td>
<td>19</td>
<td>4,87</td>
</tr>
<tr>
<td>Respiratory disorders (asthma, Bronchitis, TBC, COPD)</td>
<td>18</td>
<td>4,62</td>
</tr>
<tr>
<td>Stroke</td>
<td>15</td>
<td>3,85</td>
</tr>
<tr>
<td>Cardiovascular disease (CHA, SA, UA, Post stent)</td>
<td>12</td>
<td>3,08</td>
</tr>
<tr>
<td>Vertigo</td>
<td>11</td>
<td>2,82</td>
</tr>
<tr>
<td>Urinary tract disease (BPH, UTS, UTI)</td>
<td>10</td>
<td>2,56</td>
</tr>
</tbody>
</table>
Descriptions: One patient could experience more than one comorbid disease or complication.

Laboratory Results of Lipid Profile: Details of the patient’s laboratory lipid profile can be seen in the table below:

<table>
<thead>
<tr>
<th>Type of Lipid</th>
<th>Level</th>
<th>Category</th>
<th>Number of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triglycerides</td>
<td>&lt;150</td>
<td>Normal</td>
<td>88</td>
<td>32.35</td>
</tr>
<tr>
<td></td>
<td>150-199</td>
<td>Borderline high</td>
<td>57</td>
<td>20.96</td>
</tr>
<tr>
<td></td>
<td>200-499</td>
<td>High</td>
<td>108</td>
<td>39.70</td>
</tr>
<tr>
<td></td>
<td>≥500</td>
<td>Very High</td>
<td>19</td>
<td>6.99</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>272</td>
<td>100.00</td>
</tr>
<tr>
<td>LDL</td>
<td>&lt;100</td>
<td>Optimal</td>
<td>45</td>
<td>11.97</td>
</tr>
<tr>
<td></td>
<td>100-129</td>
<td>Near Optimal</td>
<td>73</td>
<td>19.41</td>
</tr>
<tr>
<td></td>
<td>130-159</td>
<td>Borderline high</td>
<td>119</td>
<td>31.65</td>
</tr>
<tr>
<td></td>
<td>160-189</td>
<td>High</td>
<td>86</td>
<td>22.87</td>
</tr>
<tr>
<td></td>
<td>≥190</td>
<td>Very High</td>
<td>53</td>
<td>14.10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>376</td>
<td>100.00</td>
</tr>
<tr>
<td>HDL*</td>
<td>&lt;40</td>
<td>Low (male)</td>
<td>1</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>&gt;40</td>
<td>High (male)</td>
<td>4</td>
<td>80.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>5</td>
<td>100.00</td>
</tr>
<tr>
<td>HDL*</td>
<td>&lt;50</td>
<td>Low (female)</td>
<td>7</td>
<td>41.18</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>High (female)</td>
<td>10</td>
<td>58.82</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>17</td>
<td>100.00</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>&lt;200</td>
<td>Desirable</td>
<td>8</td>
<td>10.53</td>
</tr>
<tr>
<td></td>
<td>200-239</td>
<td>Borderline high</td>
<td>33</td>
<td>43.42</td>
</tr>
<tr>
<td></td>
<td>≥240</td>
<td>High</td>
<td>35</td>
<td>46.05</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>76</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Description:

1. Percentage of total cholesterol, LDL and triglycerides was calculated from the number of patients who had the lipid data.
2. *Percentage of HDL was calculated for each male and female patient who had the data.

Use of Anti-Dyslipidemia in Type 2 Diabetes Mellitus Patient

Type And Regimenation of Anti-dyslipidemia Therapy: The following is a detailed profile of the types of anti-dyslipidemia therapy and regimenation can be seen in the following table:

<table>
<thead>
<tr>
<th>Type of Anti-dyslipidemia</th>
<th>Number of Patient</th>
<th>Percentage (%)</th>
<th>Name of Drug</th>
<th>Number of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMG-CoA reductase inhibitors</td>
<td>315</td>
<td>80.77</td>
<td>Simvastatin</td>
<td>314</td>
<td>80.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Atorvastatin</td>
<td>1</td>
<td>0.26</td>
</tr>
<tr>
<td>Fibrate</td>
<td>89</td>
<td>22.83</td>
<td>Fenofibrate</td>
<td>81</td>
<td>20.77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gemfibrozil</td>
<td>8</td>
<td>2.06</td>
</tr>
</tbody>
</table>
Regimen of Anti-dyslipidemia

<table>
<thead>
<tr>
<th>Name of Drug</th>
<th>Dose and Frequency</th>
<th>Route</th>
<th>Number of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simvastatin</td>
<td>1x10 mg PO</td>
<td>116</td>
<td></td>
<td>29,74</td>
</tr>
<tr>
<td></td>
<td>1x20 mg PO</td>
<td>198</td>
<td></td>
<td>50,77</td>
</tr>
<tr>
<td>Atorvastatin</td>
<td>1x20 mg PO</td>
<td>1</td>
<td></td>
<td>0,26</td>
</tr>
<tr>
<td></td>
<td>1x100 mg PO</td>
<td>23</td>
<td></td>
<td>5,90</td>
</tr>
<tr>
<td></td>
<td>1x150 mg PO</td>
<td>1</td>
<td></td>
<td>0,26</td>
</tr>
<tr>
<td></td>
<td>1x200 mg PO</td>
<td>24</td>
<td></td>
<td>6,15</td>
</tr>
<tr>
<td></td>
<td>1x300 mg PO</td>
<td>30</td>
<td></td>
<td>7,69</td>
</tr>
<tr>
<td></td>
<td>1x600 mg PO</td>
<td>30</td>
<td></td>
<td>7,69</td>
</tr>
<tr>
<td></td>
<td>1x300 mg PO</td>
<td>8</td>
<td></td>
<td>2,05</td>
</tr>
</tbody>
</table>

Description:
1. One patient could receive more than one therapy
2. Fourteen patients received combination therapy
3. PO: per oral; IV: intravena.

Identification of Drug Related Problems (DRP)

Drug Interaction: Patients’ problems with potential drug interaction (DRP) can be seen in the following table:

<table>
<thead>
<tr>
<th>Drug Interaction</th>
<th>Mechanism and Response</th>
<th>Solution</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simvastatin with Amlodipine</td>
<td>Amlodipine inhibit cytochrome P450 so that statin metabolism is decreased, concentration of statin in serum will increase, ESO statin will increase.</td>
<td>Reducing dose of Simvastatin</td>
<td>66</td>
<td>16,92</td>
</tr>
<tr>
<td>Simvastatin with Diltiazem</td>
<td>Diltiazem inhibit cytochrome P450, so that statin metabolism is decreased, concentration of statin in serum will increase, ESO statin will increase.</td>
<td>Reducing dose of Simvastatin</td>
<td>3</td>
<td>0,77</td>
</tr>
</tbody>
</table>

Side Effect of Drug: This research found patient with actual DRP. Actual DRP that was found in one patient (0,26%) and side effect of drug is allergic to fenofibrate which it can make side effect such as skin rash.

Response of Therapy Based on Laboratory Data

The following table shows the achievement profile of a patient’s lipid level from previous therapy:

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Classification of Lipid Level Based on Risk Group</th>
<th>N</th>
<th>Achievement Lipid Level of Previous Therapy Profile</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk (DM patient)</td>
<td>LDL &lt;100 mg/dL</td>
<td>90</td>
<td>Achieved (12,22%) Not Achieved (87,78%)</td>
<td>100,00</td>
</tr>
<tr>
<td></td>
<td>HDL &gt;40 mg/dL (male)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HDL &gt;50 mg/dL (female)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TG &lt;150 mg/dL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total cholesterol &lt;200 mg/dL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very high risk (DM patient with cardiovascular disease)</td>
<td>LDL &lt;70 mg/dL</td>
<td>68</td>
<td>Achieved (7,35%) Not Achieved (92,65%)</td>
<td>100,00</td>
</tr>
</tbody>
</table>
Discussion

From the data, it can be seen that the most distributed patients who were hospitalized in the hospital are female. This is because women have estrogen which has a function in regulation of lipids. In lipid regulation, estrogen plays a role in increasing HDL and decreasing LDL. Estrogen will decrease with increasing age in women with menopause so women will be more susceptible to interference with lipid regulation\textsuperscript{10}. The number of type 2 DM patient with dyslipidemia mostly occurs in the age range of 45-64 and it will increase at age $>$41 years old. These results are in accordance with the literature that men over 40 years old and women over 50 years old are one of the risk factors of dyslipidemia.\textsuperscript{11,12}

The comorbid disease and complications can be seen that diabetic hypertension and nephropathy were the most common comorbid disease accompanying type 2 DM patients with dyslipidemia. Hypertension is one of the risk factors of complications that increases the incidence and mortality because insulin resistance enhances the process of lipolysis which causes disruption of lipid metabolism or dyslipidemia. High lipid levels cause atherosclerosis so it causes stiffness in arteries due to the accumulation of plaque so it can be experience cardiovascular complications such as stroke, coronary heart disease, retinopathy, neuropathy and nephropathy\textsuperscript{13-15}. Changes in lipid metabolism can be shown by an increasing LDL, increasing TG, and decreasing HDL. The highest obtained lipid profile was triglyceride laboratory data. Most patients still did not reach the desired and normal lipid target. HDL levels were rarely tested in laboratory lipid profiles of patients obtained in this study.\textsuperscript{2}

Type of HMG CoA reductase inhibitors that was given is simvastatin. Simvastatin is lipophilic. The absorption process is fast and the maximum level in plasma can be reached within 4 hours. Simvastatin elimination half-life (t$\textsuperscript{1/2}$) is short which is 2 hours so that simvastatin was given only once in the afternoon or evening. The timing of this administration is associated with high cholesterol synthesis at night. Another type of HMG CoA reductase inhibitor that was given is atorvastatin. Half-life (t$\textsuperscript{1/2}$) elimination of atorvastatin long is 14 hours. Simvastatin and atorvastatin had no differences in significantly reducing lipid profiles\textsuperscript{20-22}. Another anti-dyslipidemia that was given to patients is the fibrate which are fenofibrate and gemfibrozil. Fibrate is more effective for patients with hypertriglyceridemia and low HDL. Fenofibrate is also more effective in decreasing LDL in patients with hypercholesterolemia and mixed hyperlipidemia than gemfibrozil\textsuperscript{10,23,24}. The frequency of drug use must also be appropriate so that the therapy runs more optimally and get the desired therapeutic response. In this study, the regimentation of anti-dyslipidemia doses received by patients varied but was still in accordance with the range of uses in the literature.

DRP found during the study includes potential DRP which are drug interactions, ADR and DRP suitability therapy. The interaction between amlodipine with simvastatin and simvastatin with diltiazem occurs. The interaction of simvastatin with other drugs is based on the pharmacokinetic mechanism. This drug interaction can affect several pharmacokinetic parameters of simvastatin, that is increasing or decreasing maximal concentration (C$\text{max}$) and AUC of simvastatin. The use of simvastatin with amlodipin and simvastatin with diltiazem can cause decreasing simvastatin metabolism. Decreasing the metabolic process of simvastatin causes increasing concentration of simvastatin in the serum. Increased simvastatin concentration in serum potentially increase the side effects of simvastatin. Side effect that can occur is myopathy\textsuperscript{27,28}

The actual DRP that was listed is allergic to fenofibrate, a skin rash. However, other allergic reactions were not recorded in the patient’s medical record. In the therapeutic response, assessment of the achievement of plasma lipid targets is a method for evaluating the response to anti-dyslipidemia therapy and determining whether therapeutic modification or replacement therapy is necessary or not. Based on the results, there were still quite number of patients who did not achieve the predetermined lipid levels. This showed that controlling plasma lipid levels in patients with type 2 diabetes both high and very high risk is difficult, so it requires special attention in therapy. In the management of dyslipidemia therapy in type 2 DM, the main focus is not only pharmacological therapy to reduce lipid levels in the blood, but also can be balanced with modifications to non-pharmacological therapy to prevent the development of risk factors\textsuperscript{10}.

Conclusion

Most of the use of anti-dyslipidemia therapy in type 2 DM patients was in accordance with existing guidelines but the therapeutic response obtained was not as expected in this study.
Conflict of Interest: There is no conflict of interest in this study

Source of Funding: This research was carried out by a team and funded independently

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Improving Response Units Integration a Related Factor to Total Prehospital Time (TPT) on Patients of Public Safety Center (PSC) 119 in Purworejo Regency, Indonesia

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ABSTRACT

Background: Rapid response and appropriate management of Public Safety Center (PSC) 119 team is very necessary for patients who experienced trauma or serious illness in prehospital area. The aim of this study was to identify the response units integration as related factors with total prehospital time (TPT) of PSC 119 in Purworejo Regency.

Material and Method: This research was conducted by Retrospective Chart Review (RCR) design on 105 patients who treated by PSC 119 in Purworejo Regency. Bivariate test was conducted by using Spearman correlation test to investigate the correlation with response unit integration.

Results: The majority of patients were trauma by traffic accident (57.1%). The fastest TPT was 9 minutes and the longest was 105 minutes with an average of 30.85 minutes. Bivariate test results demonstrate that response units integration had a value of p=0.000 (r=0.387). It meant that there was significant correlation between response units integration with TPT.

Conclusion: This study suggests the PSC leaders to improve the integration between the call center unit with response units. The improvement of nurses’ capacity through nursing specialist education and advanced level training of prehospital emergency were very important for optimizing the quality of prehospital intervention. The result of this study was useful in the future as the basic information for research, education and service of prehospital emergency.

Keywords: Public Safety Center, Total Prehospital Time, Indonesia Prehospital Management

Introduction

Trauma contributed for 12% of disease burden in the world, with the number of patients reach up to 5 million (1). Most of trauma patients dead in prehospital phase (2). Data of medical case shows more than 356,000 patients who suffered out-of-hospital cardiac arrest (OHCA) annually in the US (3). Coronary heart disease and stroke are expected to increase up to 23.3 million in 2030 (4). Trauma due to traffic accidents (TA) in Indonesia during 2016 reached 108,696 cases, 31,195 people died, 35,285 inhabitants got severe injured, and 108,945 inhabitants got mild injuries (5). Data of medical case shows the number of diagnosed patients with coronary heart disease at the age ≥ 15 years old is estimated at 2,650,340 million people (4). The patients with hypertension that are not diagnosed in society totaled 63.2% of total existing prevalence (25.8%) (6). People who are diagnosed with diabetes mellitus (DM) totaled 2.1%, increase from the data in 2007. This indicated that the risk of cardiac emergency due to hypertension and diabetes also increase.

The potential for emergencies due to trauma or serious illness in prehospital area increase the community’s need for Emergency Medical Services (EMS) system. The EMS service starts from the call center officer that receives emergency call, then conduct dispatch the Emergency Medical Technician (EMT), paramedic or nurses who has been trained to intervene in Basic Life Support (BLS) or Advanced Life Support...
(ALS), then transfer the patient to the appropriate health care facility \(^\text{7, 8}\). Indonesia is currently implementing the EMS system called the Sistem Pelayanan Gawat Darurat Terpadu (SPGDT) \(^\text{9}\). PSC is part of SPGDT that organize and conduct a rapid response in each regency in all region of Indonesia. The system that has been implemented is important to be assessed, thus it can be determined about the service provided is good or not. One aspect that can be used as indicators of EMS service is the response time \(^{10-14}\). For example, response time achieve in 8 minute in UK, 10-15 minute in Netherland \(^7\). The other research has shown that an assessment of total prehospital time (TPT) of patients is more significant for patient’s clinical condition than the assessment of the response time \(^\text{15}\). PSC team can ideally achieve TPT <60 minutes as “golden hour” for trauma patients, or <3 hours after onset of stroke patients that required thrombolytic therapy.

Research about TPT of EMS and affected factors has been conducted in other countries. PSC 119 in Purworejo Regency, Central Java, has not been analyzed completely about the achievement of TPT and related factors. Identification of the TPT achievements is important because it may be related with prehospital service outcomes and useful to understand the level of personnel skills and support systems against the PSC operational. The purpose of this study was to identify response units integration related to TPT on patients treated by PSC 119 in Purworejo Regency.

Material and Method

This study was conducted by retrospective chart review (RCR) method. This method was design using patient data to answer research questions by using several types of data including electronic data base, the results of diagnostic tests, and records of health workers \(^\text{16, 17}\). This research had been conducted in PSC 119 Purworejo Regency, Central Java, Indonesia during January-February 2019. The population of this study was all of the patients record that treated by PSC 119 from January to December 2018. One hundred and five patiens record selected based on two inclusion criteria: (1) records of emergency patients with trauma and medical cases handled by the call center unit and response units of PSC 119 Purworejo Regency, (2) records of emergency patients who are transported to definitive care. The records which excluded were (1) records of patients with phsyciatric and obstetric emergency, (2) records of trauma and medical emergency patients who needs to be referred to the hospital, but not complete in documenting the prehospital time intervals. Data was collected by observation sheet to investigate TPT and response units integration as related factor. Univariate test was conducted to analyze the characteristics of respondents including gender, age, Mechanism of Injury (MOI)/Natur of Illness (NOI), response units integration and TPT. Bivariate analysis by Spearman correlation test used for analyzed the correlation of TPT with the response units integration.

Findings

Setting: Purworejo Regency is one of thirty-five regencies/cities in Central Java Province, Indonesia. The area of Purworejo Regency is ± 1034.82 km². Morphologically consists of lowland areas. The total population of this regency is 708,038 consist of 349,237 male and 358,801 female. Based on population density, it is divided into areas with high and low population densities. PSC 119 Purworejo started since the ratification of the Regent Regulation (Perbup) Purworejo No. 48 of 2016 on 28 October 2016. This PSC is domiciled in the Purworejo Regency Health Office. The Organizational Structure of the PSC 119 consists of the Head of the PSC 119, the secretariat team, 119 call center units, counseling units and response units. The PSC Secretariat Team is assigned to administration and information systems. The call center unit is the central unit that receives each emergency call from the patient, then dispatch the ambulances team. Personnel entitled to the call center unit currently receive 12 people consisting of 10 nurses and 2 ambulance drivers, they are supported by 146 respons units officer. All of employees both nurses and ambulance drivers have received basic emergency training. They work in three service time shifts, namely morning (07.00-14.00), afternoon (14.01-20.00) and night (21.00-07.00). Each shift consists of one operator, 1 nurse and 1 driver. The counseling unit consists of physicians who have the function of receiving and answering consultations from nurses.

Univariate and Bivariate Analysis: According to Table 1, the majority of patients were male, totaling 61 people (58.1%). The majority of patients were trauma by traffic accident, totaling 60 (57.1%). Response units integration was concluded into good category 61 (58.1%).
Table 1: Distribution of Respondents Based On Gender, Case, Mechanism Of Injury (MOI)/Nature Of Illness (NOI), And Response Units Integration

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>61</td>
<td>58.1</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>44</td>
<td>41.9</td>
</tr>
<tr>
<td>MOI/NOI</td>
<td>Traffic Accident</td>
<td>60</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Fall down</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Stab wound</td>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td>Cardiovascular Disease</td>
<td>11</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>Respiration Disease</td>
<td>2</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Neurological Disease</td>
<td>9</td>
<td>8.6</td>
<td></td>
</tr>
<tr>
<td>Endocrine Disease</td>
<td>6</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>Response units integration</td>
<td>Good</td>
<td>61</td>
<td>58.1</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>44</td>
<td>41.9</td>
</tr>
</tbody>
</table>

Table 2: Distribution of respondents based on age, TPT and On-Scene Time (OST)

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Min-Max</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>105</td>
<td>47.56</td>
<td>50</td>
<td>5-83</td>
<td>20:04</td>
</tr>
<tr>
<td>TPT</td>
<td>105</td>
<td>30.85</td>
<td>26</td>
<td>9-105</td>
<td>18:15</td>
</tr>
<tr>
<td>OST</td>
<td>105</td>
<td>12:58</td>
<td>10</td>
<td>2-44</td>
<td>8198</td>
</tr>
</tbody>
</table>

Table 2 shows that the youngest patient was 5 years old and the oldest patient was 83 years old. The fastest TPT was 9 minutes and the longest was 105 minutes with an average of 30.85 minutes. The fastest on-scene time was 2 minutes and the longest was 44 minutes with an average of 12.58 minutes.

Table 3: Correlation The Response Units Integration With TPT

<table>
<thead>
<tr>
<th>Total Prehospital Time</th>
<th>r</th>
<th>p</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response units integration</td>
<td>0.387</td>
<td>0000</td>
<td>105</td>
</tr>
</tbody>
</table>

Table 3 shows that the response units integration had a value of p=0.000. This meant that there was significant correlation between the response units integration with TPT on patients that treated by PSC 119 in Purworejo Regency (r = 0.387).

Discussion

Correlation Response Units Integration with TPT:
The statistical test result shows there was significant correlation between response units integration with TPT. The result of this study was in line with the other research (18) on the first responder community, followed by 20 medical students in the UK named Community First Responder (CFR), proven that the average response time of CFR from 89 calls were 3-8 minutes faster than the response time of ambulance. Criteria of calls received by the CFR was the location of call should be closer to the CFR as compared with the nearest ambulance; CFR was within a 5 mile of the location of the call; CFR might call central dispatch and request a higher priority call. Qualitative evaluation of this study shown that student who was trained and involved in first-responder program had the better confidence and readiness in conducting prehospital relief in patients with severe acute conditions. The univariate results of this study shown the integration of call center units and response units in PSC 119 Purworejo Regency included into category of good with percentage of 66%. This means that there was already a synergy with the response units for calls that were far from the call center unit. Unfortunately, there were still 44% which shown that the integration included into category of poor. This indicated that there were some calls that in the radius more than >5 km were not responded by the response units, thus, the ambulance from the call center unit should reach a further location.

SPGDT was a form of emergency services that integrate the PSC as a call center with its response unit. The other literature mentioned that the EMS service system operated by the operator/dispatcher, first responder, and EMT or paramedic (19). The network of first responder was the first link in chain of survival. Cooperation between call center unit in Purworejo Regency with response units in 27 primary health care called “puskesmas” as the closest first responder to the patient had been implemented since the issue of Decree of Head of Health Office No.188/27/2017. There was a collective agreement if the distance calls >5 km, the operator would dispatch response units. Good integration between the call center unit with response units were expected to be able to provide fast service. The result of this study was consistent with the recommendations of the National Highway Traffic Safety Administratiion (NHTSA) in United State, entitled “EMS Agenda For The Future “ (20). One of the 14 things that were...
recommended by the NHTSA for the functioning of EMS system was the integration of health services. The presence of ambulance officers from the nearby response unit as the first responder to the scene could shorten the response time and TPT.

This study was different with the previous research (21), which was conducted by using Delphi method to develop EMS design in UK. The consensus result agreed on the importance of system integration development with a first responder by involving police, firefighters and commoner who were trained. Police or firefighters who were trained in prehospital emergency could be involved in handling prehospital cases (8). PSC 119 in Purworejo Regency utilized the puskesmas which were spread in 27 points. Empowering health care worker such as the nurses or physicians who already have basic knowledge about health and emergencies, deemed more likely than with the involvement of police or firefighters who had not been trained.

Currently, PSC in Purworejo Regency has not yet involve other agencies such as the police and firefighter as the first responder. This could be considered by the policy makers for the implementation of emergency services to be more integrated in the future. Community volunteers in Purworejo also can be involved. As the consequences, this step needed to be prepared with socialization and training of those who would be involved as first responders. In the future, conducting preceptorship programs and training for ambulance first responder for the nurse or medical student could create a good symbiotic mutualism between students, the PSC and the community. Students could be more prepared for managing prehospital cases, the PSC could achieve the target of short TPT, and community get the prehospital service more quickly.

Conclusion and Recommendation

There was significant correlation between response units integration factors and TPT. It was expected that in the future integration with response units would be better, thus the services provided would be more optimal. It was recommended that expanding networks of first responder was not only involve the response units of 27 puskesmas but also other parties such as police, fire fighters and trained community. Policies to supervise the complete TPT documentation, distance and integration between call center unit and reponse unit is useful for evaluation of PSC’s performance. Developing manual standard about prehospital documentation including TPT and its related factors is needed in the future.

Conflict of Interest: There is no conflict of interest in conducting this research.

Source of Funding: This research was funded by the Human Resource Quality Improvement Center (Puskat Mutu SDMK) of the Indonesian Ministry of Health.

Ethical Clearance: This study had received permission from the Ethics Committee, Faculty of Medicine, Brawijaya University with No. 08/EC/KEPK-S2/01/2019 on January 17, 2019.

Acknowledgment

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Climate Change: An Overview of the Prevalence of Dengue Hemorrhagic Fever in The South Sulawesi Province of Indonesia

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Abstract

Makassar City, Maros Regency and Tana Toraja Regency in South Sulawesi Province are regions with varying topography. Makassar City is a lowland area (1-19 DPAL), Maros Regency is a middle-land region with variations in height of 15-700 DPAL and Tana Toraja Regency located in the Toraja highland region 700 - 820 DPAL which is ideal for the breeding of Aedes aegypti mosquitoes as a vector which is dominant to the incidence of dengue hemorrhagic fever, because it has a temperature between 19,00° - 31,00° C (Central Meteorology Climatology and Geophysics Council region IV Makassar), with humidity between 63-94%. Between temperature and humidity affect each other for the breeding of Aedes aegypti, climate conditions (temperature and humidity) will support the increase in mosquito population density and subsequently have an impact on the transmission and spread of dengue hemorrhagic fever. Temperature between 20° C - 30° C with a humidity range of 60% - 90% is the optimum moisture for growth and development of the Aedes aegypti mosquito⁴. The aim of the study was to determine the effect of climate conditions on the transmission and spread of dengue hemorrhagic fever in South Sulawesi Province. This type of research is cross-sectional by measuring all variables at the same time. The research sites were Makassar City, Barru Regency and Tana Toraja Regency. Analysis using Spearman Correlation. The results showed that there was a significant relationship between air temperature and duration of solar radiation on the number of cases of dengue hemorrhagic fever (rs = 0.281 and 0.265 p <0.000), while also having a significant relationship but with negative rs (p = 0.001).

Conclusion climate factors are related to the incidence of ddb in the province of South Sulawesi. Prevention of ddb should be by anticipating environmental improvements to eliminate climate factors in order to suppress cases of dengue hemorrhagic fever.

Keywords: climate, dengue hemorrhagic fever.

Introduction

In 2014 there were 139 cases of dengue fever in all Puskesmas areas in Makassar City with rates of illness/IR = 10.15 per 100,000 population of whom there were 2 deaths due to DHF. Cases in 2014 declined compared to 2013 with the number of cases 265 with rates of illness/IR = 19.6 per 100,000 population of whom there were 11 cases of deaths due to dengue, the number of 2012 was 86 cases with a rate of illness/IR = 6.3 per 100,000 population and there are 2 deaths¹,⁵,⁷. In addition to Makassar City, Maros Regency is also an endemic area of DHF, from 14 Subdistricts in Turikalle District, the highest incidence of DHF. While in Tana Toraja Regency, it is also prone to dengue attacks, especially in Makale District²,³,⁴.

Makassar City, Maros Regency and Tana Toraja Regency in South Sulawesi Province are regions with varying topography. Makassar City is a lowland area (1-
Based on the description above, the relationship between average temperature for mosquito growth is 25º - 27ºC. The optimum temperature for the breeding of Aedes aegypti mosquitoes as a vector dominant to the incidence of DHF, because it has a temperature between 19.00ºC - 31.00ºC (Central BMKG region IV Makassar), with humidity between 63-94%\(^8,10,15\). Between temperature and humidity affect each other for the breeding of Aedes aegypti, climate conditions (temperature and humidity) will support the increase in mosquito population density and subsequently have an impact on the transmission and spread of dengue disease. Temperatures between 20ºC - 30ºC with a humidity range of 60% - 90% is the optimum moisture for growth and development of the Aedes aegypti mosquito\(^9,11,12\). DHF is one of the public health problems in Indonesia where the number of sufferers tends to increase as well as the wider area of spread. DHF is affected by dengue virus which is transmitted by Ae. aegypti and Aedes albopictus\(^4\).

Disease transmission is strongly influenced by climate factors in a region. Parasites and vectors of disease are very sensitive to climate factors, especially air temperature, rainfall, humidity and wind. DHF needs to be watched out because transmission of this disease will increase with climate change\(^13,14,20\). Climate is related to the breeding habitat of Aedes aegypti mosquitoes. The conditions of rain and heat alternating at the turn of the season are more positive for the mosquito population because rainwater does not flow and stagnate in several places\(^16,17,19\). The climate of South Sulawesi Province varies as in Maros Regency which is a lowland area, namely 26.0 ºC to 28.8 ºC, Makassar City 25.5 ºC to 29.0 ºC, and Tana Toraja District which is a plateau ranging from 21.1 ºC to 29.0 ºC\(^18,21\).

Mosquitoes are cold-blooded animals so that the metabolic processes and life cycles depend on the temperature of the environment, unable to regulate their own body temperature against changes outside their body. Mosquitoes can survive at low temperatures but the metabolic process decreases and even stops when the temperature drops to a critical temperature. At temperatures higher than 35ºC, also experience limitations in physiological processes. The optimum average temperature for mosquito growth is 25º - 27ºC\(^9\). Based on the description above, the relationship between air temperature, humidity, rainfall, duration of solar radiation, and rainy days has been investigated with an increase in the incidence of dengue hemorrhagic fever in South Sulawesi Province.

Material and Method

This type of research is quantitative and is an analytical study to analyze the relationship of climate with the incidence of dengue hemorrhagic fever. This design aims to reveal correlative relationships between variables. The location of the study was carried out in South Sulawesi Province in three regions, namely Makassar City, Maros Regency and Tana Toraja Regency. The selection of this location is based on the consideration that the three regions are endemic areas of DHF with different social demographics as well as the topography. Time of research for 1 year starting June 2015 until May 2016.

The population and sample in this study were purposive sampling by directly assigning 250 people each study area who had symptoms of endemic DHF. So the sample size in this study was 750 respondents.

The independent variables are climate (air temperature, humidity, rainfall and duration of sun and rainy days) obtained from the data of the Meteorology and Geophysics Agency of Makassar City, Barru Regency and Tator in 2011-2015, while the dependent variable is dengue hemorrhagic fever using data the number of cases of dengue hemorrhagic fever in 2011-2015 was obtained from the Makassar City Health Office, Barru Regency and Tator. Data analysis using the Spearman correlation test.

Findings

The duration of solar radiation for the Makassar region tends to be higher than that of Maros and Tana Toraja. The highest Makassar irradiation rate occurred in 2015, the Maros region had the highest sun exposure rate in 2015, and Tana Toraja the highest rate of solar radiation occurred in 2013. The high level of solar radiation in a the area will have an impact on the breeding and spread of mosquitoes.

The relation between rainy days and the spread of dengue disease is determined by the presence of wind speeds that influence the flight and spread of mosquitoes,
if the wind speed is 11-14 m/sec or 25 - 31 miles/hour it will inhibit mosquito flight. Wind speed on rainy days is when mosquitoes fly into or out of the house, and this is one of the factors that determine the amount of contact between humans and mosquitoes.

Table 1: Climate Relationship with 2011-2015 Dengue Fever Events

<table>
<thead>
<tr>
<th>Relationship</th>
<th>$r_s$ (Spearman Correlation)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air temperature</td>
<td>0.281</td>
<td>0.000</td>
</tr>
<tr>
<td>Humidity</td>
<td>-0.263</td>
<td>0.001</td>
</tr>
<tr>
<td>Rainfall</td>
<td>-0.274</td>
<td>0.001</td>
</tr>
<tr>
<td>Duration of sunlight</td>
<td>0.265</td>
<td>0.001</td>
</tr>
<tr>
<td>Rainy day</td>
<td>-0.265</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Climate relations which include air temperature, humidity, rainfall, and duration of solar radiation with the number of DHF cases show a probability value of <0.05, which means there is a significant relationship of climate to DHF cases.

Discussion

Climate change can affect the ecosystem of animal habitats that transmit disease, even natural growth of colonies of germs. Climate can affect the pattern of infectious diseases because vectors and viruses are sensitive to changing climate$^9,10$.

The incidence and spread of dengue hemorrhagic fever in South Sulawesi Province cannot be separated from the existence of climate as a cause of the proliferation of various types of parasites and vectors of diseases that are very sensitive to climate. In relation to the incidence and spread of dengue fever, the existence of climate, especially temperature, humidity, rainfall, rainy days according to wind speed, and solar radiation is a climate that directly affects the occurrence of various distributions and densities of vector organisms and intermediate hosts. Vector-borne diseases such as malaria and dengue fever need to be watched out for because transmission of such diseases will increase in accordance with climate change. As in South Sulawesi Province, where in the three regions observed, Makassar City, Maros and Tana Toraja Regency are tropical regions whose climate supports the proliferation of disease vectors.

Climatic conditions in the three regions observed showed that rainfall, humidity, temperature and sun exposure throughout the year greatly supported the proliferation of dengue fever disease vectors which greatly affected the vector life cycle of Aedes, especially in breeding from eggs, larvae, larvae and mosquitoes adult. Therefore, to anticipate climate support that affects the proliferation of Aedes aegypti vectors, efforts are needed to improve the environmental system.

The air temperature is a state of heat or cold air. The temperature of the air due to climate change causes the mosquito incubation period to be shorter. As a result, mosquitoes will breed faster. The increasing population of mosquito vectors will increase the chances of disease agents to infect humans.

Air humidity has an indirect influence on the metabolic process and the development of mosquitoes. When low humidity causes evaporation of water from the body which causes dryness of body fluids. One of the enemies of mosquitoes is evaporation because low humidity shortens the life of mosquitoes, although it does not affect parasites. The humidity level of 60% is the lowest limit to allow mosquitoes to live. Humidity also affects the ability to fly mosquitoes. Small mosquitoes have a large surface because of the respiratory system with the trachea. At the time of flight, mosquitoes need more oxygen so that the trachea is opened. Thus evaporation of water from the mosquito’s body becomes larger. in the body from evaporation, the flight distance of mosquitoes is limited.

Rainfall variability can have direct consequences for infectious diseases. Increased rainfall can increase the presence of disease vectors by expanding the size of existing larval habitats and creating new mosquito breeding grounds. Rain is an important factor in influencing vectors, such as mosquitoes.

The presence of rainfall affects the humidity of the air and the breeding places of mosquitoes also breeding places the incidence of diseases transmitted by mosquitoes usually increases some time before the heavy rainy season or after heavy rains that can leave inundation where mosquitoes are favored. Mosquitoes carrying Dengue Fever are at tropical and subtropical regions, which are dominated by high rainfall$^{21}$. 
There are several results of previous studies that showed that the climate greatly determines the incidence of Dengue Hemorrhagic Fever. The results of the study show the results of the study based on the results of observations revealed that climate factors have a close relationship with the incidence of DHF\(^6\). The results of this study observe that there are influences of temperature, humidity, rainfall, and solar radiation that are positive and significant for the incidence or incidence of DHF. In addition, the climate can affect the pattern of infectious diseases because agents of disease in the form of viruses, bacteria, or parasites and disease vectors are sensitive to the presence of temperature, humidity, rainfall, wind speed, and solar radiation in the environment. WHO also states that mosquito-borne diseases such as dengue are highly associated with very bad climatic conditions.

**Conclusion**

Climate factors in the form of temperature, humidity, rainfall, duration of solar radiation and the number of rainy days are determinants of mosquito breeding as disease vectors that can cause Dengue Hemorrhagic Fever. Bad climate factors support mosquito breeding compared to stable climate factors.

**Conflict of Interest:** Between subjects and researchers does not include conflict, because the data used is secondary data with the permission of the authorized institution.

**Source of Funding:** This research received funding sources from the Makassar Health Polytechnic Budget based on a rigorous selection from the expert team.

**Ethical Clearance:** Before the research, the research protocol was reviewed by the research ethics commission of the Faculty of Public Health, Airlangga of University, Surabaya, Indonesia.

**REFERENCES**


Sensory Evaluation of Jam Produced from Hearts of Palm Kestawee Varieties of Phoenix Dactylifera, L

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1Department of Food Science, College of Agricultural Engineering Sciences, University of Baghdad, Iraq

ABSTRACT

As the chemical composition of heart palm the main components of moisture contents were 87.1, and the proteins contents were 2.11. Either carbohydrates amounted to 7.12, either in fat models were the 1.30. estimated the percentage of ash in the models were 1.28. The work evaluated the sensory quality of jam produced from hearts of palm Kestawee varieties of Phoenix dactylifera, L. Pulp was extracted from hearts obtained from new market. The pulp produced was mixed with prepared and standardized citric acid-sugar syrup, allowed to cook on constant boiling/stirring and the gelatinization temperature and the time were taken and recorded. The prepared jam was carefully poured in steam/ethanol sterilized jam bottles and cocked immediately the jam was allowed to cool. The cooled jam was served to panelist to compare sensory acceptability of the heart palm jam alongside apple jam. Sensory evaluation revealed significant difference (P>0.05) in colour and aroma of the samples while there was no significant difference (P<0.05) in the texture and sweetness of samples tested. The study concludes that hearts of palm Kestawee varieties of Phoenix dactylifera, L. is a promising source of pectin which can be successfully applied in food gel system such as fruit jams.

Keyword: hearts of palm, Jam Produced.

Introduction

The heart of Palm is characterized by a very high nutritional value1 which makes it an effective treatment for many health problems that negatively affect the stability of human life2, thanks to its unique natural structure rich in essential elements needed by the body in specific quantities per day. This type of vegetable is derived from the perennial palm tree. Brazil is home to it3. It is used in many fields, especially the food field4. He is anemic because he is rich in iron, helping to raise the hemoglobin level in the blood. It also contains vitamin A which is very useful for the strength of eyesight, and for the health of pregnant women specifically, as it protects against congenital malformations affecting the fetus, and ensures proper growth of the nervous system. Contains calcium, which ensures the building of bones, nails, muscles, teeth, and protects the fragility and bone lobe that affects the elderly greatly4. Contains improved fiber to work the digestive system, which protects against constipation and indigestion, and helps to put toxins out of the body. It contains the hormone, which is very useful for ovarian stimulation in women. It also protects against depression, as it reduces nervous tension. It contains vitamin C anti-inflammatory and allergy6.

Jam is an example of fruit preserve usually made from pulp and juice of one fruit whole fruit7. It can be defined as cooked and gelled fruit purses packaged for long term storage which is normally used as bread spread, fillings and food jellies. The preparation of fruit jam traditionally involves the use of pectin as a gelling agent, although sugar or honey and citric acid may be added as well8. Good jam has a soft even consistency without distinct pieces of fruit, a bright colour, good flavour and a semi-jelled texture that is easy to spread but has no free liquid9.

Pectin refers to a group of diverse complex polysaccharides found in the primary cell wall and intercellular space (middle lamella) of plants cells. It is

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most abundant in young tissues and are the characteristic constituents of fruits (Ihekoronye and Ngoddy, 1985). Pectin is a high molecular polymeric carbohydrate which is present in all plants\textsuperscript{10}. It is a purified carbohydrate product generally obtained from the acid extraction of the inner portion of the citrus fruit peels and apple pomace\textsuperscript{11}. Pectin is mainly used in food as a gelling of boiled fruits preparations. Today, it is used in fillings, sweets, and as a source of dietary fiber in food.

Materials and Method

The heart palm powder was analyzed for moisture, protein, fat, ash and carbohydrate contents\textsuperscript{12}. Carbohydrate content of samples was determined as total carbohydrate by difference method. All determinations were done in triplicate and the results were expressed as the average value.

Production of Heart Palm Jam: The of heart palm used for the work were purchased from New Market Iraq, Baghdad. The of heart palm were washed thoroughly with clean water and cut into small sizes. The seeds were carefully removed using knife, and the jackfruit peeled then blended using Kenwood blender Model 5024ID. The juices from the fruits were sieved with muslin cloth and the fruit pulp kept in clean bowl. 300ml of water to 250g of sugar was used to prepare sugar syrup. The syrup was boiled at 100°C and 4g of citric acid was added, and allowed to boil again until a slippery feel to gel was formed, it was placed acid to cool. 200g of the fruit pulp was concentrated and the prepared syrup added on boiling, it was allowed to cook on constant boiling/stirring and the gelatinization temperature and the time were taken and recorded. At the end, the prepared jam was carefully poured in steam/ethanol sterilized jam bottles and cooked immediately the jam was allowed to cool\textsuperscript{12,13}.

Determination of Total Dissolved Solids (TDS): The total dissolved solids of the samples were determined using a total dissolved solids meter (ATP Instrumentation –TDS- 5031- Meter High range. ATP Instrumentation, UK.). The instrument probe was inserted into a beaker containing the sample and allowed for a few minutes until the reading equilibrated.

Sensory Evaluation: Sensory evaluation of the jam samples were conducted as described\textsuperscript{14} using 10-members panel randomly selected from the university community. The samples were packaged in a transparent jam bottles and presented in a coded manner. The sensory quality attributes of the samples were color, taste, aroma and sweetness\textsuperscript{15}.

In the questionnaire presented to the panelists, they were requested to observe and taste each sample as coded with bread provided and grade them based on a 4-point hedonic scale showing least acceptable to most acceptable in all attributes.

Results and Discussion

Composition of Heart Palm: The heart palm (Fig. 1) heart palm powder were analyzed for moisture, protein, fat, ash and total carbohydrate contents. The results are presented in Table 1. The fresh heart palm contained moisture 87.01%, protein 2.11%, fat 1.30%, ash 1.82% and total carbohydrate 7.12 %. The composition of heart under study was more or less similar to those reported by\textsuperscript{16}. They reported the nutrient content of fresh heart palm as follows: Moisture 84.20%, protein 4.22-5.89%, carbohydrate 9.24%, fat 1.7%, ash1.65%.\textsuperscript{17}\textsuperscript{also found that heart palm contained water 81.55-82.82%, protein 2.78%, fat 0.32%, and ash 0.97%.

The table 2 showed average sensitivity of palm heart, apple jam, color analyzer, odor, texture, and tissue analysis. The results obtained from the analysis showed that sample B contains the best acceptable color at an average of 9.5, while sample A contains the lowest color (7.5). However, there was no significant difference between B and A.

For the odor sample B, the highest value is 9.5, while sample A has the lowest value (8.0). Results showed that there was no significant difference between B and A.

In texture, sample B contains the highest value of (8.0), but there is no significant difference in sample A and B,

In the sweet B sample, the highest value is (9.0) while sample A has the lowest value of (7.5), but there is no significant difference in sample A, B in terms of sweetness.

The result of the sensory evaluation shows that the sample B (apple) is more acceptable followed by A (Heart of palm).
Fig. 1: Heart palm powder

Table 1: Composition of heart palm

<table>
<thead>
<tr>
<th>Components</th>
<th>Fresh heart palm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>87.01</td>
</tr>
<tr>
<td>Protein</td>
<td>2.11</td>
</tr>
<tr>
<td>Fat</td>
<td>1.30</td>
</tr>
<tr>
<td>Ash</td>
<td>1.82</td>
</tr>
<tr>
<td>Total carbohydrate</td>
<td>7.12</td>
</tr>
</tbody>
</table>

Table 2: Comparison between apple jam and heart of palm jam in color and some sensory qualities

<table>
<thead>
<tr>
<th>T. Test</th>
<th>Apple jam B</th>
<th>Heart of palm jam A</th>
<th>Adjective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.52</td>
<td>9.5</td>
<td>7.5</td>
<td>Color</td>
</tr>
<tr>
<td>1.44</td>
<td>9.5</td>
<td>8.0</td>
<td>Odor</td>
</tr>
<tr>
<td>1.06</td>
<td>8.0</td>
<td>7.0</td>
<td>Textures</td>
</tr>
<tr>
<td>1.37</td>
<td>9.0</td>
<td>7.5</td>
<td>Taste</td>
</tr>
</tbody>
</table>

(P<0.05)

Conclusion and Recommendation

The results obtained from the study showed that heart of palm is a promising source of pectin which can be successfully applied in food gel system such as fruit jams jellies and fillers etc. However, this tropical fruits wastes a lot due to underutilization. If optimally utilized for pectin and jam production could significantly reduce the present wastage and waste disposal problems encountered while handling heart of palm, thereby reducing post-harvest losses. From the results obtained, it showed that heart of palm can be industrial source pectin. This lower pH tends to create more preserved and stable jam which is less prone to microbial spoilage. It is therefore recommend that detailed and improved research should be done on the pectin from these lesser known sources to produce better jam with improved sensory attributes\(^{18}\).

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

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Study of the Biological Effect of Substitution Soybean Meal with *Lupinus albus* L. on Some Somatic and Sex Hormones in Awassi Lambs from Weaning to Puberty

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¹Dep.of Animal Production, College of Agriculture, University of Tikrit, Iraq; ²College of Veterinary Medicine, University of Tikrit, Iraq

**ABSTRACT**

This study was carried out at the farm of the Animal Resources Dept., College of Agriculture, University of Tikrit during the period from 15/2/2017 to 15/6/2017. Twelve Awassi lambs at the age of 4-5 months of age with an average weight of 24.65 ± 2.49 kg, were distributed into 3 groups (4 lamb/group) to study the effect of replacement of soybean meal (SM) with *Lupinus albus* L. (LA) at levels of 0, 6 and 12% for the T1 (control), T2 and T3 respectively and its effect on some hormones growth hormone, thyronine, thyroxine, testosterone, interstitial cell stimulating hormone ICSH and Follicle stimulating hormone FSH levels for four age periods, 4-5, 5-6, 6-7 and 7-8 month for 1st, 2nd, 3rd and 4th periods respectively. A significant increase (P≤0.01) in lambs weight in T3 at the 2nd and 4th periods. Also, substituting with LA in proportion 6 and 12% showed a significant increase (P≤0.01) in the levels of thyroxine, testosterone, ICSH and FSH. In addition. This study concludes that it is possible to substitute soybean meal with *Lupinus albus* L. for in lambs’ provender which raises the level of certain hormones.

**Keywords:** Soybean meal, *Lupinus albus* L., hormones, Awassi lambs

**Introduction**

Physiological changes associated with sexual maturity in different types of animals provided evidence of the importance of nutrition in puberty. Hafez and Hafez¹ have expressed the term threshold body weight for the weight at which an animal reaches sexuality and does not reach sexuality below it. Puberty is reached by an increased frequency of GnRH hormone secretion pulses from the hypothalamus, leading to increased frequency of the FSH and LH hormones produced from the pituitary at high and sufficient levels, which is responsible for increasing the stimulation of the offspring. Centralized mechanisms which time puberty are sensitive to the critical levels of metabolic signals². Repeated LH hormone secretion as a reflection of GnRH hormone secretion is more correlated with body size compared to age in growing lambs, as it can increase significantly and rapidly by increasing the level of nutrition³. The free fed lambs with high levels of energy and protein showed a very higher GnRH hormone pulse rate than that of lambs fed on low energy and protein content. In response to this hormonal action, the testis secretes the testosterone hormone from the interstitial cells called Leydig cells responsible for showing secondary male traits as well as sexual activity or desire to mate⁴.⁵. One of the crops used to strengthen the body structure of animals and have a positive effect is the use of lupine seeds, which gave a positive role and an effective alternative to soybean meal⁶. Lupine seeds and soybean meal are considered reliable food supplements which can be depended on in feeding ruminants⁷,⁸. Purroy⁹ did not find any significant differences in the replacement of lupine seeds by soybean meal in the lamb’s provender in the digestion rate of dry material, organic matter, raw protein, and raw fiber. Kung¹⁰ and Tracy¹¹ noted decrease in growth rates of lambs fed on lupine seeds in substitution to soybean meal as a protein source. This

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is because there is a proportion of indivisible proteins in the soybean meal which is not digested in the rumen and, therefore, passes into the small intestine, which is considered an economic loss, while feeding on the lupine seeds reduces the amount of non-digestible acids. Thus, the aim of our study was to detect the biological effect of substituting soybean meal with white lupine seeds at the level of certain body and sexual hormones from weaning to puberty in Awassi lambs.

Materials and Method

The study was conducted from 15/2/2017 to 15/6/2017 in Constantine region at the location of the animal production farm of the College of Agriculture/University of Tikrit. A total of Twelve Awassi lambs were divided into three groups (each group consisted of 4 lambs), aged between 4 - 5 months with an average control body weight of 24.65 ± 2.49 kgs. The control group (T1) was fed on a diet* containing 12% soybean and 0% *Lupinus albus*, the 2nd group (T2) was fed with a diet containing 6% soybean and 6% *Lupinus albus*, and the 3rd group (T3) was fed on 0% Soybean and 12% *Lupinus albus*.

Table 1: Ingredient percentages of the experimental diets of Awassi lambs

<table>
<thead>
<tr>
<th>Ingredients (%)</th>
<th>Diets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Barley</td>
<td>48</td>
</tr>
<tr>
<td>Wheat</td>
<td>19</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>19</td>
</tr>
<tr>
<td>Soybean</td>
<td>12</td>
</tr>
<tr>
<td><em>Lupinus albus</em> L.</td>
<td>0</td>
</tr>
<tr>
<td>Salt</td>
<td>1</td>
</tr>
<tr>
<td>Minerals and vitamins</td>
<td>0.5</td>
</tr>
<tr>
<td>Limestone</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>CP%</td>
<td>15.8</td>
</tr>
</tbody>
</table>

*The chemical analysis has been calculated as the ratio of crude protein to all components of the chemical analysis tables of the Iraqi feed material.

Animals were housed in an individual cage 1.35m², supplied with a container for diets, minerals, salt, and water. Blood was collected once every 15 days from a jugular vine. Samples were collected into a 10 ml serum clot tube from each lamb in the morning before feeding, and blood samples were centrifuged at 3000 rpm for 10 minutes, for separation of serum. The serum samples were stored at -20°C before analysis. Then, they were performed according to the manufacturers’ instructions as follows. Serum tests were performed according to the manufacturers’ instructions for the work kit. A veterinary preventive system was followed that included dosing and vaccination against internal and external worms and smallpox. The method of Danzer to determine the ICSH mlu/ml concentration and the applied method of Odell to determine the concentration of FSH mlu/ml and testosterone ng/ml concentration was determined by measured of Moltz. The method for the detection of thyronin (nmol/L) and thyroxine (nmol/L) was adopted from Dunn. The concentration of growth hormone (ng/ml) concentrations was determined by according to Henry.

Statistical Analysis

All data were expressed as means ± standard error (SE). Differences between group means were estimated using a one-way analysis of variance (ANOVA) and a Duncan using the software SAS. Data from the experiment were analyzed according to the following model: Yij = μ + Ti + eij

Where: Yij = the dependent variable, μ = mean, Ti = effect of the treatment (i = control, 6% *Lupinus albus*, 12% *Lupinus albus*), eij = random residual error.

Results and Discussion

Table (2) showed the third treatment were significant increased (P ≤ 0.01) in lamb weights during the second and fourth period 29.63 and 35.70 kg, respectively, compared with control 25.79 and 32.65 kg respectively. This finding agreed with Alkhatib in the absence of significant differences in the weights of the uterine lambs fed on the lupine seeds by 4% and 8%, but there was an improvement in the daily growth rate of the lambs using lupine seeds as an alternative to fenugreek in nutrition. Kung also recommended the use of lupine seeds as an alternative to soybeans in feeding lambs because there were no negative effects on lamb weights. While Tefera found a significant superiority of the Washera lamb, which was fed 300 gm of white lupine in its provender.
Table 2: Effect of substitution of soybean meal with *Lupinus albus* for on Awassi lambs weights (kg) (mean ± S.E.)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>24.38 ± 1.09</td>
<td>b 25.79 ± 0.26</td>
<td>30.80 ± 0.37</td>
<td>b 32.65 ± 0.25</td>
</tr>
<tr>
<td>T2</td>
<td>24.35 ± 0.95</td>
<td>ab 27.88 ± 0.60</td>
<td>32.60 ± 0.86</td>
<td>ab 34.28 ± 0.52</td>
</tr>
<tr>
<td>T3</td>
<td>25.10 ± 1.25</td>
<td>a 29.63 ± 0.91</td>
<td>33.53 ± 0.78</td>
<td>a 35.70 ± 0.73</td>
</tr>
</tbody>
</table>

*a,b* means in the same column, with different subscripts indicate a significant difference (P < 0.01)

-T1: control 0% LA 12% SB
-T2: 6% LA 6% SB
-T3: 12% LA 0% SB

In Table (3), there was a significant increase (P≤0.01) in T3 at thyronine (4.983 nmol/L) compared to the T2 and control (2.398 and 2.970 nmol/L) respectively. The table indicates a significant increase (P ≤ 0.01) in thyroxine at T2 (88.518 nmol/L) and the T3 82.485 (nmol/L) at the 2nd (5-6) compared to the control of 72.885 (nmol/L).

Table 3: Effect of level substitution of soybean meal with *Lupinus albus* on levels of thyronine, thyroxin and growth hormone (mean ± S.E.)

<table>
<thead>
<tr>
<th>Periods</th>
<th>Treatments</th>
<th>Hormones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>Threonine (nmol/L)</td>
</tr>
<tr>
<td>1st</td>
<td>T1</td>
<td>3.010 ± 0.158</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>2.938 ± 0.229</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>2.420 ± 0.161</td>
</tr>
<tr>
<td>2nd</td>
<td>T1</td>
<td>3.160 ± 0.233</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>2.835 ± 0.179</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>2.798 ± 0.110</td>
</tr>
<tr>
<td>3rd</td>
<td>T1</td>
<td>b 2.970 ± 0.126</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>b 2.398 ± 0.363</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>a 4.983 ± 0.486</td>
</tr>
<tr>
<td>4th</td>
<td>T1</td>
<td>2.863 ± 0.241</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>3.360 ± 0.508</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>3.285 ± 0.321</td>
</tr>
</tbody>
</table>

*a,b* means in the same column, with different subscripts indicate a significant difference (P < 0.01)

-T1: control 0% LA 12% SB
-T2: 6% LA 6% SB
-T3: 12% LA 0% SB

In 4th, the significant increase (P ≤ 0.01) in the T2 87.872 (nmol/L) compared to the T3 and control 76.642 and 70.950 (nmol/L), soybeans contain the elements of isoflavones in large amounts compared to lupine. These elements affect the ability of the thyroid gland to produce threonine and thyroxin, as well as the more the elements of isoflavones are increased in the content of the lamb provender it leads to the weakening of the thyroid gland tissue and the size of its follicles20. In the table, the results showed the lack of significant differences between the treatments in the concentration of the growth hormone during the four periods of breeding. The possibility of partially replacing the lupine seeds in place of the soybean meal in the provender of the Awassi lambs has a positive effect on the body development of the animals, live weight and other body measurements21. In addition, lupine seeds and soybean meal are considered food supplements that can be reliable for feeding ruminants. The lack of differences between the treatments can also be attributed to the equilibrium of the provender in terms of its energy and protein content, which attributes the possibility of replacing the lupine seeds with the soybean meal19.

The high level of energy and protein has a vital effect on the GnRH hormone pulse rate, which in turn has increased the concentration of (ICSH and FSH) hormone pulses produced by the pituitary gland that affects the stimulation of the gonads22. The animals
over 90 days of balanced nutrition were able to reach the threshold of weight at the age of puberty in an early age\(^1\). The reaching of Awassi lambs to a weight of 34-35 kg at an age of 212 days is considered a good indicator of balanced nutrition that is rich in energy and protein, which in turn has had a positive effect on increasing the size of the body and the growth of the genitals. The complete growth of the body contributed to the reaching of the animals to the desired body weight at the age of early sexual maturity. The weight of lambs reached 35.0 kg for the Awassi strain and at the age of 212 days. This is an indicator of early puberty due to balanced nutrition since weight increase is considered important for the growth of the genitals\(^2\).

Table 4: Effect of level substitution of soybean meal with Lupinus albus on levels of testosterone, ICSH and FSH

<table>
<thead>
<tr>
<th>Periods</th>
<th>Treatments</th>
<th>Hormons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Testosterone ng/ml</td>
</tr>
<tr>
<td>1(^{st})</td>
<td>T1</td>
<td>0.091 ± 1.382</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.246 ± 1.537</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.152 ± 1.324</td>
</tr>
<tr>
<td>2(^{nd})</td>
<td>T1</td>
<td>1.323 ± 0.096 b</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.610 ± 0.087 b</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>2.348 ± 0.126 a</td>
</tr>
<tr>
<td>3(^{rd})</td>
<td>T1</td>
<td>2.455 ± 0.124 b</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>4.788 ± 0.404 a</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.733 ± 0.184 b</td>
</tr>
<tr>
<td>4(^{th})</td>
<td>T1</td>
<td>3.288 ± 0.547 ab</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.743 ± 0.431 b</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>4.013 ± 1.028 a</td>
</tr>
</tbody>
</table>

\(^{a,b}\) means in the same column, with different subscripts indicate a significant difference (P < 0.01)

- T1: control 0% LA 12% SB.; -T2: 6% LA 6% SB.; -T3: 12% LA 0% SB.

Table 4 shows that the levels of the testosterone (2.348 ngm/ml) and ICSH 0.155 mIU/ml respectively increased significantly (P ≤ 0.01) in the T3 during the 2\(^{nd}\) compared to the T2 1.610 (ngm/ml) and 0.113 mIU/ml respectively and control 1.323 ngm/ml and 0.098 mIU/ml respectively; while at the 3\(^{rd}\) the level of testosterone decreased significantly (P ≤ 0.01) in the T3 1.733 compared to the T2 4.788. As for the level of the follicle stimulating hormone, it had significantly decreased in the T2 0.308 mIU/ml and T3 0.343 mIU/ml compared with the control 0.148 mIU/ml. In the 4\(^{th}\), the T3 was reintroduced 4.013 ngm/ml by increasing significantly (P ≤ 0.01) in the testosterone level compared to the T2 1.743 ngm/ml. The control (3.288 ngm/ml) was not significantly different from the two treatments in this period. This was found by\(^23\) when he used two levels of lupine and found its direct effect in stimulating the secretion of the hormone GnRH, because it has a strong correlation between the level of nutrition and reproductive efficiency and the acceleration in reaching puberty in male lambs\(^24\).

**Conclusion**

Based on the obtained results, it is possible to substitute soybean meal whit *Lupinus albus* L. for in lambs’ provender which raises the level of certain hormones.

**Conflict of Interest:** None

**Source of Funding:** self

**Ethical Clearance:** Not required

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2. Galal S, Gürsoy O, Shaat I. Awassi sheep as a genetic resource and efforts for their genetic


Evaluation Factors for Non Medical Treatment Failure Patients
Tuberculosis Lung Health in Children on Makassar City

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1Department of Nursing, 2Department of Nutrition, Makassar Health Polytechnic, Indonesia

ABSTRACT

The purpose of the study, known factors associated with treatment failure patients Tuberculosis in children. The method used is an observational design, cross-sectional study intended to determine the factors associated between the independent variables (independent) and dependent variable (dependent) with the identification of all the variables. Both of these variables can be seen at the time of execution simultaneously. The findings in this study found that low education, low knowledge and disobedience taking drugs is a factor that has a strong risk of treatment failure patients with pulmonary tuberculosis in children, while family support only protective factor (prevention) and not a risk factor for treatment failure patients with TB in children, The conclusion showed that the variables influencing the failure of treatment of TB patients is variable education and knowledge has a value of OR unchanged at 22.752 in CI 95% to the value of the lower limit (LL) = 1.032 and Upper limit (UL) = 501.786 with a significance level of 0.048 <0.05.

Keywords: pulmonary tuberculosis, failure, treatment, children.

Introduction

In 1993 the WHO to declare TB as a global health emergency, because it is a major health problem worldwide cause of morbidity in millions of people each year and recommends the DOTS strategy as a strategy to control TB. TB is regarded as a community health problem of the world despite efforts to control the DOTS strategy has been implemented since 1995 by the WHO report in 2015, in 2014 there were 9.6 million cases of pulmonary tuberculosis in the world, 58% of TB cases are in Southeast Asia and the Western Pacific Region and 28% of cases are African. In 2014, 1.5 million people worldwide die from TB. Tuberculosis is second only to Human immunodeficiency virus (HIV) as an infectious disease that causes most deaths in the world’s population. Indonesia is a country located in Southeast Asia with the second largest number of TB cases in the world after India14. In 2014 TB cases in India and Indonesia, respectively, are 23% and 10% of cases. Based on the WHO report in 2015, the prevalence of TB cases in Indonesia in 2014, including HIV, 647 per 100,000 population1,3.

According to the Global Tuberculosis Report WHO14, estimated the incidence of tuberculosis in Indonesia in 2015 amounted to 395 cases/100,000 population and a mortality rate of 40/100,000 population (of HIV patients with TB are not counted) and 10/100,000 population in HIV patients with tuberculosis.models, according to calculations Prediction based on data tuberculosis prevalence survey 2013-2014. Estimates of the prevalence of tuberculosis in 2015 amounted to 643 per 100,000 population in 2016 and estimates as high as 628 per 100,000 populations3,5.

The incidence of pulmonary tuberculosis is still very high and difficult lowered, this was due to issues non-medical such as; poverty, poor nutritional state, hygiene, low low purchasing power, low education cause failures and delays in getting a diagnosis8.

Although widely available in TB treatment, but current TB treatment failure remains a major health problem worldwide. Therefore, the objective of this study was to evaluate the non-medical factors that influence the rate of treatment failure patients with tuberculosis (TB) in children Lung Health Center.
Material and Method

This study is a quantitative research with cross sectional approach which has been conducted on June-September 2017 in four health centers in the region of Makassar. The population in this study was all mothers of children (aged 5-18 years) who received treatment of pulmonary tuberculosis at the sites. The samples of this study were all patients within 4-6 months of treatment. Our inclusion criteria are Sementra Tuberculosis patients in treatment, willing to become respondents and the age of 5 -18 years, so that a sample size of 42 respondents, taken by total sampling technique.

Data collection instrument was a questionnaire for respondents observe TB treatment failure. Questioners made by researchers and have tested the validity and reliability using the values of r and α values obtained chronbach of 0.824. The method of data collection in this study with a total sampling where the entire population of the research sample4. Data analysis was performed with the statistical test Ratio Prevalence (RP). RP is characterized by a value of the confidence interval (confidence interval) which will determine whether the ratio of the prevalence of significant or not with the parameters: if the confidence interval passes (not including) the number 1 on the starting point, then the risk factors are meaningfully and if the confidence interval below (cover) number 1 at the starting point, it is not a significant risk factor5. Interpretation of the results of the ratio of prevalence at a value confidence interval (CI) is also based on the value ratio Prevalence (RP) with the parameters: if RP = 1, meaning that the independent variable is not a risk factor, if RP>1 and CI does not include numbers 1, meaning that the independent variable is a risk factor and if RP <1, CI no caps a numeral 1, which means that the independent variable is a protective factor or a deterrent. Data processing was performed using SPSS for Windows.

Findings

This study aimed to evaluate the role of non-medical factors against TB treatment failure in Makassar City Regional Health Center. Of the 42 respondents, the majority were in the age group 16 to 18 years (40.5%).
Table 4: Obedience with taking medication with Tuberculosis Treatment Failure Rate at Puskesmas Minasa Upa, Batua Raya, Antang Perumnas and Antang Makassar City, period June - September 2017

<table>
<thead>
<tr>
<th>Obediance Rate</th>
<th>Treatment Failure</th>
<th>Number</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>21.4%</td>
<td>19%</td>
</tr>
<tr>
<td>Obedient</td>
<td>1</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2.4%</td>
<td>57.1%</td>
<td>59.5%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>32</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>23.8%</td>
<td>76.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 5: Support the family on the children with Failure rate Tuberculosis treatment at Puskesmas Minasa Upa, Batua Raya, Antang Perumnas and Antang Makassar City period June - September 2017

<table>
<thead>
<tr>
<th>Support</th>
<th>Failure treatment</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>16.7%</td>
<td>23.8%</td>
</tr>
<tr>
<td>No support</td>
<td>3</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>71%</td>
<td>52.4%</td>
<td>59.5%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>32</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>23.8%</td>
<td>76.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 6: Effect of Education, knowledge, not obedience, and family support to toward Tuberculosis Failure Treatment Rate at Puskesmas Minasa Upa, Batua Raya, Antang Perumnas and Antang Makassar City, period June - September 2017

<table>
<thead>
<tr>
<th>Categorical variables</th>
<th>B</th>
<th>p</th>
<th>Exp (B)</th>
<th>For Exp (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Education</td>
<td>3.125</td>
<td>.048</td>
<td>22.752</td>
<td>1.032</td>
</tr>
<tr>
<td>Knowledge</td>
<td>3.125</td>
<td>.048</td>
<td>22.752</td>
<td>1.032</td>
</tr>
<tr>
<td>Obedience</td>
<td>2.920</td>
<td>.049</td>
<td>18.538</td>
<td>1.007</td>
</tr>
<tr>
<td>Support</td>
<td>-339</td>
<td>.823</td>
<td>0.712</td>
<td>0.036</td>
</tr>
</tbody>
</table>

Discussion

Data analysis of the 42 respondents obtained through data collection in the health center: Minasa, Batua, Antang and Housing Antang Makassar, the results are as follows:

a. Education Level: Table 3.9. Shows Bivariate analysis of test results that the value of OR = 39,000 with CI = 95%, P-Value = 0.001 < 0.05, and UL LL = 4.116 = 369.510. The value of RR = 16,200, LL = 2.266 and the value UL = 115.841 does not include the value of 1, then it is said to be meaningful and Ho rejected. Results of multivariate analysis showed the educational value of 22.752 with a level of 95% (P = 0.048 < 0.05) value LL = 1.032 and the value UL = 501.786 does not include the number 1. The test results of bivariate and multivariate test results both showed that education has an influence very strong against pulmonary TB treatment failure in children.

Research explains that the duration of TB treatment should be carried out for 6-8 months. Duration of time can cause the patient to become bored and impatient and cause undisciplined and disorganized to take medication that failed in the treatment, but for patients who have a good knowledge will continue to take medication appropriate treatment program. Further explains that the failure of the treatment and cure TB patients contribute directly to the knowledge acquired through education. Education can influence attitudes and behavior of someone who is a product of a learning process carried out consciously. Higher education for someone to be able to change the mindset formed a unified awareness in order to change a healthier lifestyle in everyday life. Although the level of education does not always directly Luru with TB disease yng enough education means not always a determinant of treatment success absoluteness of someone who is suffering from tuberculosis disease or illness

b. Level of knowledge: Shows the results of analysis test Bivariat that the value of OR = 39,000 with CI = 95%, P-Value = 0.001 > 0.05, the value LL = 4.116 and the value UL = 369.510, the value of RR = 16,200, the value LL = 2.266 and the value UL = 115.841 not mencup value of 1, then it is said to be meaningful and Ho rejected. Multiavriat test results show the value of the knowledge of 22.752 with a level of 95% (P = 0.048 < 0.05), values LL = 1.032 and the value UL = 501.786 does not include the number 1. Thus
both bivariate and multivariate testing both show that the level of knowledge has a very strong influence of treatment failure.

Knowledge is the result of the know and this occurred after people perform sensing on a particular object\textsuperscript{9,11}. Knowledge is very important in shaping the mindset, attitudes and behavior and actions of a person. Health knowledge can help individuals to adapt to the disease, preventing complications and learn to solve problems when faced with a new situation.

Knowledge of TB patients about the disease are factors that affect the incidence of TB suffered by a patient, therefore, a good knowledge of the illness will make the patient aware and determined to do what should be done and so is what should not be done so as to maintain and avoid events worse, and when not protecting and maintaining health, in line with the research. Instead minimal knowledge about the illness, can not in itself raises awareness for the need for regular medical treatment. Within their health development goals to improve public health\textsuperscript{5,7,8}.

c. Noncompliance Drink Drugs: Results show that the value of OR = 27,000 with 95% CI, 0.004 P-Value, the value LL = 2.946 and the value UL = 247.487. The value of RR = 13.235, value LL = 1.842, the value UL = 95.093 does not include the value of 1, then it is said to be meaningful and Ho rejected. Results of multivariate analysis showed noncompliance value of 18.538 with a level of 95\% (P = 0.049 <0.05) value LL = 1.007 and the value UL = 341.215 does not include the number 1. Both bivariate test results multivariate testing results show that the non-compliance has to take medicine strong influence on lung TB treatment failure in children while suffering from tuberculosis.

Compliance TB patients take medication regularly and on time is a crucial factor in the healing process Tuberculosis\textsuperscript{13}. Compliance includes: schedule time to take medication, taking medications according to the number, type of drug, the dosage is in etiquette drug, drug spending, came to the health center regularly taking medication before the medicine runs out and always remember the advice of health officials. In line with the research that has been done by Muniroh et al that the results show the value of P-Value = 0.001 (P <0.05).

The high rates of treatment compliance due to the high level of motivation, education and knowledge, and understand the importance of health; it is also inseparable from the patient’s awareness of the importance of healthy living which says that the use of Anti-Tuberculosis Drugs (OAT) improper/irregular or interrupted treatment can lead to drug resistance of Mycobacterium tuberculosis\textsuperscript{3,5,8,10}. The other variable factors cause patients do not regularly seek treatment even stopped the treatment prematurely, namely the emergence of drug side-effects such as vertigo, nausea, vomiting and headache, which eventually gives rise to non-compliance, trust factor, factor bustle and lacking/not understand the reaction of the drug in the body. TB treatment takes a long time (4-6 months) to achieve healing and with a guide (a combination of) several kinds of drugs, so it is not uncommon patients stop taking medication before the treatment is completed which resulted in treatment failure\textsuperscript{1,6,10,12}.

**Conclusion**

There is a relationship with the education level of TB disease treatment failure in bivariate and multivariate analysis at 95\% confidence showing OR value and the value of LL and UL > 1 so that the level of education is a risk factor for TB disease treatment failure in children.

There is a relationship with the knowledge level of TB disease treatment failure in bivariate and multivariate analysis at 95\% confidence showing OR value and the value of LL and UL > 1 so that a low level of knowledge of a risk factor for TB disease treatment failure in children.

There is a relationship Take medication adherence with treatment failure of TB disease, the bivariate and multivariate analysis at 95\% confidence showing OR value and the value of LL and UL > 1 so that non-compliance with taking medication is a risk factor for TB disease treatment failure in children.

There is no family support relationship with TB disease treatment failure, the multivariate analysis showed 95\% CI indicates the value of OR and LL and UL < 1 so that family support is a protective factor rather than as a risk factor for TB disease treatment failure in children.
Conflict of Interest Statement: This study there was no conflict of interest between the researcher and the subject.

Source of Funding: This research was funded independently by researchers, because they did not get sponsorship from other institutions.

Ethical Clearance: This study received ethical recommendations from the health research ethics commission of the Makassar Health Polytechnic No. 390/KEPK-PTKMKSVII/2017.

REFERENCES


Maternal and Fetal Outcomes of Labor in Grand-Multipara Women

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ABSTRACT

Grand multiparity represented a big challenge facing health institutes and obstetricians especially in developing and poor communities due to accompanying hazards on mothers and fetuses. This study aimed to identify the risk factors and outcomes of grand multiparity among group of Iraqi women. Hence, a prospective clinical study was conducted at labor rooms of Alzahraa Teaching Hospital, Alkut Teaching Hospital and Alshaheed Fairose Hospital in Al-Kut governorate in Iraq during January, 1, 2018 to January, 31, 2019. A total of 1000 pregnant women; 500 pregnant women with grand multiparity (parity ≥ 5) and 500 pregnant women with multiparity history of (2-4). Data were collected through direct interview and examination of the participated women or from their medical records and then followed for 10 days after labor to assess the maternal and neonatal outcomes. Findings revealed adverse neonatal outcomes in 3.6% of women with grand multiparity which was significantly higher than other ones (p=0.02). The neonatal complications of grand multipara women were intrapartum stillbirth, early neonatal death, birth injury and admission to NICU. A significant association was found between incidence of maternal adverse outcomes and women with grand multiparity (p<0.001). The maternal complications in grand multiparity women were perineal tear, hysterectomy, intrapartum hemorrhage and cord prolapsed. Grand multiparity of pregnant women was significantly related to increased age, unemployment and low educational level. The main obstetrical complications were high rates of cesarean sections and oligohydraminosus. In conclusion, grand multiparity was associated with adverse maternal and neonatal outcomes.

Keywords: Grand multiparity, Multiparous, Maternal outcomes, Neonatal outcomes.

Introduction

Grand multiparity represented a big challenge facing the health institutes in developing countries which is accompanied by high rates of obstetrical and neonatal complications1. Grand multiparity is defined as giving birth of more than five times; live births or stillbirths of more than 20 weeks gestation, while the multiparity is birth of 2-4 times and primiparity is birth of one time in addition to nulliparity of no birth2. The grand multiparity is always related to bad family planning with big burden on family and society3. Nowadays, strict antenatal care and regular checking with advancing of delivery care techniques have been associated with better outcomes of grand multiparity 4,5. Many authors clarified the medical and obstetrical difficulties of grand multiparity among Iraqi women and detected the weakness of Iraqi family planning and antenatal programs in limiting and caring of women with grand multiparity 4,5. The family planning system in developed countries was the main cause of decreasing rates of grand multiparity to reach an incidence of 3-4% while in developing countries, the incidence of grand multiparity reached about 10-30% 8-10. Increased parity among families in these poor communities is related to bad outcomes for fetuses, mothers and the family specifically if accompanied with bad antenatal care1-11. The grand multiparity is associated with gestational and delivery complications especially when accompanied with poor or absent antenatal care,
short intervals between subsequent pregnancies, no contraceptive methods, older age of mother and bad quality of health system. The grand multiparity is more prevalent with higher morbidity and mortality rates in rural areas of developing countries. The main complications of grandmultiparity are either systemic like anemia, obesity, diabetes mellitus and hypertension or obstetrical like perineal tear, obstructed labor, malpresentation, placenta previa, placental abruption high rate of cesarean sections, retained placenta, hysterectomy, ruptured uterus and postpartum hemorrhage. Variances in death rates for fetuses and mothers are commonly related to bad health services especially for women with grand multiparity. Unfortunately, there was a predisposition of women with grand multiparity for lower utilization of medical services with increasing number of pregnancies specifically for delivery in hospitals or assisted delivery. Cultural, social and economic changes in Iraq in last years are associated with increase rates of grand multiparity that is accompanied with high morbidity and mortality rates in addition to economic burden on families and national health system.

Methodology

This was prospective clinical follow up study which conducted at the labor rooms of Alzahraa Teaching Hospital, Alkut Teaching Hospital and Alshaheed Fairrose Hospital in Al-Kut governorate in Iraq during the period from 1st of January, 2018 to 31st of January, 2019. The study included 1000 singleton pregnant women at labor aged (20-45 years). Women who was Primigravidity (nulliparity history), primiparity, had previous cesarean section, preexisting medical diseases and current smoking history were excluded.

Participants women assigned into two groups with 500 women in each group, group 1 included women with grand multiparity (para≥5) and group 2 included the remaining 500 pregnant women with multiparity of (2-4). Data were collected through full history and complete clinical examination of participant women. The baseline data collected either directly from pregnant women or from their records. Data were gathered in a pre-constructed data collection sheet (questionnaire) included the demographic and clinical information. The neonatal and maternal outcomes of pregnant women were reported.

The participant pregnant women were admitted to labor rooms after reporting signs of labor like. The obstructed labor was referred by the responsible Gynecologist to surgical operation room for cesarean section.

Post-delivery maternal assessment was done by researcher and gynecologists in the hospital, while neonatal assessment was performed by pediatricians in the hospital. Radiological imaging and laboratory investigations were performed in the hospital.

Maternal complications and outcomes were reported and medications were prescribed accordingly. Sometimes, perineal tear was sutured in the labor room under local anesthesia, but in some cases it needed surgical intervention in operation room. Neonatal outcomes and admission to neonatal care unit were documented under supervision of a pediatrician. Follow up was continued for 10 days after labor. Statistical analysis was performed using the statistical package for social sciences (SPSS) version 22, IBM, US software for windows and appropriate statistical tests and procedures applied accordingly at a level of significance of 0.05 or less to be significant.

Results

The mean age of the 500 grand multipara pregnant women of group 1 was significantly higher than that of multiparity women in group 2; 27.7 ± 5.4 years vs. 25.5 ± 4.4 years respectively, (P<0.001). Vast majority of participant women in both groups were housewives. A significantly higher employment rate for multiparous women (p<0.001). The educational level of grand multipara women was distributed as followings; low (24%), intermediate (75.8%) and high (0.2%) and for multiparous women, it was low in (13.8%) intermediate in (78.4%) and high in (7.8%) with a significant difference between both groups (p<0.001). Grand multipara women with low socioeconomic status (SES) were 61 (12.2%) women, with intermediate SES were 430 (86%) women and those with high SES were 9 (1.8%) women, with no significant difference in SES between both groups, (P>0.05), (Table 1).

No significant differences were observed between both studied groups regarding gestational age (p=0.2), fetus lie (p=0.1), spontaneous labor (p=0.06) and presentation (p=0.1). Grand multipara women had significantly higher cesarean sections rate compared to those in group 2, 26% vs. 18.5%, respectively, (p=0.01). A significant association was observed between grand multiparity and oligohydraminos (p<0.001) where oligohydraminos reported in 11.8% of grand multipara group compared to only 3% of multiparous women (Table 2). In grand multiparity group, 3.6% of women
developed adverse which was significantly higher than multiparous group (p=0.02). The neonatal complications recorded for grand multipara women were intrapartum stillbirth (55.6%), early neonatal death (33.2%), birth injury (5.6%) and admission to NICU (5.6%); there was a significant association between intrapartum stillbirth and grand multiparity (p=0.007). A highly significant association was observed between high maternal adverse outcomes and women with grand multiparity (p<0.001); 17.6% of women with grand multiparity had adverse maternal outcomes in comparison to 6.6% of multiparous women. The complications of women with grand multiparity were perineal tear (90.9%), hysterectomy (5.7%), intrapartum hemorrhage (2.3%) and cord prolapse (1.1%); the perineal tear was significantly more frequent in grand multipara women (p<0.001). (Table 3)

Table 1: General characteristics distribution according to Grand Multipara and multiparous women

<table>
<thead>
<tr>
<th>Variable</th>
<th>Grand multipara</th>
<th>Multipara</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>No.  %</td>
<td>No.  %</td>
<td></td>
</tr>
<tr>
<td>20-29 years</td>
<td>312 62.4</td>
<td>418 83.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>30-39 years</td>
<td>176 35.2</td>
<td>80 16.0</td>
<td></td>
</tr>
<tr>
<td>40-45 years</td>
<td>12 2.4</td>
<td>2 0.4</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>0 0</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>498 99.6</td>
<td>473 94.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Employed</td>
<td>2 0.4</td>
<td>27 5.4</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Gestational and obstetrical characteristics distribution according to Grand Multipara and multiparous women

<table>
<thead>
<tr>
<th>Variable</th>
<th>Grand multipara</th>
<th>Multipara</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age</td>
<td>No.  %</td>
<td>No.  %</td>
<td></td>
</tr>
<tr>
<td>Preterm</td>
<td>4 0.8</td>
<td>9 1.8</td>
<td>0.22</td>
</tr>
<tr>
<td>Term</td>
<td>496 99.2</td>
<td>491 98.2</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Neonatal and maternal outcomes distribution according to Grand Multipara and multiparous women

<table>
<thead>
<tr>
<th>Variable</th>
<th>Grand multipara</th>
<th>Multipara</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fetus lie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longitudinal</td>
<td>468 93.6</td>
<td>480 96.0</td>
<td>0.10</td>
</tr>
<tr>
<td>Vertex</td>
<td>32 6.4</td>
<td>20 4.0</td>
<td></td>
</tr>
</tbody>
</table>

| Presentation      |                 |           |     |
| Cephalic presentation | 463 92.6 | 475 95.0  | 0.10 |
| Breech presentation | 37 7.4         | 25 5.0    |     |

| Mode of delivery  |                 |           |     |
| Normal vaginal delivery | 370 74.0 | 402 80.4  | 0.01 |
| Cesarean section  | 130 26.0        | 98 19.6   |     |

| Hydrominosus      |                 |           |     |
| No                | 434 86.8        | 476 95.2  | <0.001 |
| Oligohydraminosus | 59 11.8         | 15 3.0    |     |
| Polyhydraminosus  | 7 1.4           | 9 1.8     |     |

| Neonatal complications |     |     |
| Yes                  | 18 3.6 | 6 1.2 | 0.020 |
| No                   | 482 96.4 | 494 98.8 |     |

| Types of neonatal complications |     |     |
| Intrapartum stillbirth         | 10 55.6 | 0 0.0 | 0.007 |
| Birth injury                   | 1 5.6   | 2 33.3 |     |
| Need admission to NICU         | 1 5.6   | 3 50.0 |     |
| Early neonatal death           | 6 33.2  | 1 16.7 |     |
| Total                           | 18 100.0 | 6 100.0 |     |

| Maternal complications         |     |     |
| Yes                             | 88 17.6 | 33 6.6 | <0.001 |
| No                              | 412 82.4 | 467 93.4 |     |
Types of maternal complications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
<th>%</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapartum hemorrhage</td>
<td>2</td>
<td>2.3</td>
<td>13</td>
<td>39.4</td>
</tr>
<tr>
<td>Cord prolapse</td>
<td>1</td>
<td>1.1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Perineal tears</td>
<td>80</td>
<td>90.9</td>
<td>15</td>
<td>45.4</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>5</td>
<td>5.7</td>
<td>5</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>88</td>
<td>100.0</td>
<td>33</td>
<td>100.0</td>
</tr>
</tbody>
</table>

![Figure 1: Proportional distribution of overall Neonatal complications among the studied groups](image1.png)

![Figure 2: Proportional distribution of overall Maternal complications among the studied groups](image2.png)

Discussion

The parity history was regarded by many authors as an independent risk factor for gestational complications and still becomes as a challenge for obstetricians in management of deliveries. Grand multiparity pregnancy has been associated with many gestational, labour and puerperium complications for both mother and fetuses since many years ago. Present study showed significantly higher adverse neonatal outcomes for women with grand multiparity in comparison to multiparous women (p=0.02). This finding is consistent with results of Abbas et al study in Iraq and Qamar et al study in Pakistan which reported poor neonatal outcomes for women with grand multiparity in comparison to multiparous women. The intrapartum stillbirth and early neonatal death were significantly the common adverse neonatal outcomes of women with grand multiparity (p=0.007). Similarly, Al-Rubae study in Iraq revealed that rate of stillbirth was significantly higher for women with grand multiparity. Kc et al study in Nepal found that multiple birth history is one of common risk factors for intrapartum stillbirth. Our study showed a highly significant association between high maternal adverse outcomes and women with grand multiparity (p<0.001). This finding is consistent with results of many literatures like Ahmed and Al-Saffar study in Iraq, Alhainiah et al study in Saudi Arabia and Bezircioğlu et al study in Turkey which all proved that grand multiparity had a significant role in development of adverse maternal complications like perineal tear, antepartum hemorrhage and hysterectomy. In current study, the perineal tear was the significant adverse maternal outcome for women with grand multiparity (p<0.001). Consistently, previous Pakistani study documented that genital tract trauma specifically perineal tear is commonly related to grand multiparity and lead to infection, hemorrhage and shock. Inconsistent with our findings, Al-Shaikh et al found that Saudi women with grand multiparity had the pregnancy risks and outcomes of women with low parity and they stated that advanced age play role in risks related to grand multiparity. However, many literatures stated that grand multiparity in low socioeconomic countries are related poor antenatal care, anemia, pregnancy, labour and postpartum complications in addition to its effect on neonatal outcomes. In this study, grand multiparity was significantly associated with increased age of women, unemployment and low educational level (p<0.001). These finding coincide with results of Severinski et al study in Croatia which revealed that women with grand multiparity were significantly characterized by advanced age, unemployment, low educational level and unmarried or divorced than multiparous women. All these sociodemographic characteristics are the results of multiple pregnancies of women in developing or poor countries. Our study showed a significantly higher cesarean section rates for women with grand multiparity (p=0.01). This finding is considered as one
of adverse obstetrical outcomes for women with grand multiparity which is similar to results of Al-Sammani and Ahmed study in Sudan⁴ which reported high rates of cesarean section among women with grand multiparity in comparison to multiparous women due to prevalent fetal macrosomia. Current study showed also a highly significant association between oligohydraminos and women with grand multiparity (p<0.001). This finding is in agreement with results of Ahmed study in Sudan²⁵. The oligohydraminos is regarded as common obstetrical complication of women with grand multiparity²⁰.

**Conclusions**

Grand multiparity of women is accompanied by adverse maternal and neonatal outcomes. The main obstetrical complications were high rates of cesarean sections and oligohydraminos. The main risk factors related to grand multiparity of women were advanced age, unemployment and low educational level. Special efforts are needed to strengthening the national antenatal care system in Iraq in addition to social, cultural and health sectors re-enforcement in facing the grand-multiparity with strengthening of national family planning program.

**Ethical Clearance**: All ethical issues were approved and the data were collected according to the World Medical Association declaration of Helsinki, 2013, for the researches including human being.

**Conflict of Interest**: Declared none.

**Source of Funding**: None, self-funded

**REFERENCES**


ABSTRACT

Used in this study, 21 local Awassi lambs age 3-4 months and primary weight of 21.5 kg were period the experiment 3 months to study the effect of chromium in the blood biochemical properties (cholesterol, triglycerides, total protein, glucose, low-density lipoprotein (LDL), high-density lipoprotein (HDL) and very low-density lipoprotein (VLDL), The study showed a significant difference (P <0.05) for the treatment of 600 μg Chromium Yeast on control treatment and the other of the treatments for the total protein trait for the first period of the experiment. In the second period of the experiment, the added treatments did not have a significant effect on the studied traits, except the low-density lipoprotein (LDL), where all the added treatments of low-density lipoproteins compared to control. While triglycerides, total protein, glucose and very low-density lipoproteins (VLDL) to 300 μg Chromium Chloride compared with control for the third period. Low-density lipoproteins (LDL) were decreased in all additive treatments compared to control and high-density lipoproteins (HDL) increased with 300 μg Chromium picolinate compared to other treatments for the same period.

Keywords: lambs, chromium, biochemical blood traits.

Introduction

Chromium is a component of the periodic table, which is a transition metal and its atomic number. 24, the word chrome came from the Greek and pronounced chroma in the sense of color due to the color of its compounds, which is one of the most common elements in the crust and sea water1. There are two types of chromium triple as a result of its association with other compounds, inorganic chromium such as chromium chloride (CrCl3) and organic chromium such as chromium picolinat (CrPic) and chromium yeast (Cr-yeast) 2. There is a discrepancy in the information available regarding levels of chromium in animal feed, In general, the concentrations of chromium identified in traditional ruminants feed are between 0.3-1.6 mg/ kg as the feed material is generally poor in chromium3. Chromium is incorporated into a compound formula called glucose balancing agent (GTF), which is the link of chromium (the most influential compound) with some acids namely clotamic asid, niacin, claysin and systeine. GTF is an essential nutrient that increases the action of insulin and thus regulates the metabolism of protein, fat and carbohydrates2. Many studies have indicated the role of triple chromium (III) in decreased harmful cholesterol (LDL) (low-density lipoprotein cholesterol) And increased the useful cholesterol (HDL) high density lipoprotein cholesterol) in blood4,5. There was a relationship between chromium decreased, indicated blood insulin levels and indicated cholesterol levels. high cholesterol level was observed in mice exposed to chromium decreased. When chromium was added to the interest, a decrease in cholesterol levels in blood. 5reported that of chromium decreased leads to an increased incidence of heart disease, high levels of insulin and blood glucose in addition to high cholesterol, low HDL and immune degradation.

The objective of the study was to investigate the effect of adding various sources and levels of organic and inorganic chromium to feed as feed additives in the performance of the Awassi lambs and their effect on the biochemical traits of blood.
Materials and Method

In this study, 21 local lamb were used, ranging age 3 to 4 months, at a weight of primary 21.5 kg. The homogeneity of animals was observed and the experiment lasted for 3 months. Lambs were randomly assigned to seven treatments and 3 lambs per treatment. A fixed feed was provided concentration for all experimental animals. The sources and concentrations of the different chromium were added to the treatments as follows:

**T1**: Treatment control (without addition).

**T2**: added 300 μg of Chromium Yeast/kg of concentration feed.

**T3**: added 600 μg of Chromium Yeast/kg of concentration feed.

**T4**: added 300 μg of Chromium Picolinate/kg of concentration feed.

**T5**: added 600 μg of Chromium Picolinate/kg of concentration feed.

**T6**: added 300 μg of Chromium Chloride/kg of concentration feed.

**T7**: added 600 μg of Chromium Chloride/kg of concentration feed.

The lambs were randomly distributed to individual pens with dimensions of 1.75 m x 1.25 m. Each pen contained a plastic feeder for concentration feed, another for rough feed and a 5 liter plastic water purifier. Chromium samples were prepared for each type of experiment using a by taking weight Each type is Enough for 50 kg of concentrated feed and according to the concentration used in each treatment. This quantity was powder with a small electric mill and then mixed with 50 kg of concentrated feed by a micro mixture.

All lambs were fed on a basic diet of concentrated fodder (55% grated barley, 22% bran, 15% grated wheat, 7% soya, food salt) Feeding 3% of live body weight, wheat straw was provided as raw feed and free to all lambs throughout the experiment.

Blood was withdrawn from the jugular vein in three periods (the first period of 30 days from the start of the experiment, the second period 60 days from the start of the experiment, the third period 90 days from the beginning of the experiment). Place in clean, sterile 10 ml plastic tubes and leave for 1 hour under temperature The laboratory was then kept under 4° C in the refrigerator. The tubes were arranged in a 45 ° angle for 24 hours. The centrifuge was then placed at 3000 ° C/min for 20 minutes to separate the serum from the rest of the ingredients. Closed under temperature - 20°C serum until biochemical tests I ran the blood serum tests as per the manufacturer’s instructions for the kit.

The data were statistically analyzed using the General Linear Model (GLM) within8 for the following mathematical model: Yil = μ + Ci + eil

The differences between the averages were compared with9 polynomial test

Results and Discussion

Table (1) shows that the difference chromium sources added to all the treatment did not significantly affect blood cholesterol in all periods. This is agree with (10;11;12), Triglycerides were not affected by the added treatments in the first and second periods and 300 μg Chromium Chloride increased triglycerides in the third period significantly (P <0.05) compared with control (39.33, 26.0) mg/100 ml and this result is agree with (11) and differs with (10;13), Table (1) shows that the total protein was significantly increased in the first phase of the experiment at P <0.05. The treatment was 600 μg Chromium Yeast compared with control (7.93, 6.66) g/100 ml Was not affected by the second period and also increased in the third period where the treatment of 300 μg Chromium Chloride significantly (P <0.05) compared to control (13.53, 8.66) g/100 ml The result is that the chromosome has an anabolic agent rather than destruction and therefore regulates protein synthesis and controls the increase in muscle weight in the body14. This result is agree with10,13, While blood glucose was not affected in the first and second period treatments added, but increased in the treatment of 300 μg Chromium Chloride in the third period significantly compared to control ((64.33, 49.0 mg/100 ml and the reason for high glucose that chromium is associated with insulin and insulin receptors in insulin sensitive cells and increases the action of insulin hormone and thus improves metabolism of carbohydrates8 and this study agrees with11 no agrees with13,15.

Table 2 shows that high-density lipoproteins (HDL) were not affected by the first and second period
treatments added but increased in the 300 μg treatment of Chromium picolinate for the third period compared to control (63.66, 59.33) mg/100 ml. This result is agrees with\(^1\) no agrees with\(^4\), whereas low-density lipoproteins (LDL) were not affected in the first period but decreased in all added treatments in the second and third period compared to control (23.80, 7.60, 12.46, 6.20, 11.06, 16.26 8.20) mg/100 ml respectively for the second period and (15.16, 6.70, 10.40, 6.03, 11.80, 11.90, 7.93) mg/100 ml respectively. This result is agrees with (13) and no agrees with\(^4\), Table 2 also shows that very low density lipoproteins (VLDL) were not affected by the added treatments in the first and second periods. In the third period, however, the treatment was significantly increased to 300 μg (P <0.05) compared to control (7.86, 5.20) mg/100 ml.

### Table 1: General Mean ± Standard error of chromium effect in biochemical traits of Awassi lambs

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Control</th>
<th>300 μg Chromium Chloride</th>
<th>300 μg Chromium Picolinate</th>
<th>600 μg Chromium Picolinate</th>
<th>300 μg Chromium Chloride</th>
<th>600 μg Chromium Chloride</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period first</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol mg/100 ml</td>
<td>45.66 ± 12.38</td>
<td>45.66 ± 3.75</td>
<td>51.33 ± 10.17</td>
<td>41.66 ± 2.02</td>
<td>50.0 ± 10.40</td>
<td>54.0 ± 4.04</td>
</tr>
<tr>
<td>Triglycerides mg/100ml</td>
<td>32.66 ± 12.17</td>
<td>22.66 ± 4.40</td>
<td>24.33 ± 1.66</td>
<td>31.33 ± 5.20</td>
<td>31.0 ± 2.88</td>
<td>34.0 ± 13.31</td>
</tr>
<tr>
<td>Total protein g/100ml</td>
<td>6.66 ± 0.29 ab</td>
<td>6.13 ± 0.06 b</td>
<td>7.93 ± 0.48 a</td>
<td>6.33 ± 0.43 b</td>
<td>7.10 ± 0.10 ab</td>
<td>7.13 ± 0.70 ab</td>
</tr>
<tr>
<td>Glucose mg/100 ml</td>
<td>53.33 ± 7.26</td>
<td>50.0 ± 12.16</td>
<td>56.33 ± 10.03</td>
<td>56.33 ± 9.70</td>
<td>60.66 ± 5.81</td>
<td>45.33 ± 5.69</td>
</tr>
<tr>
<td><strong>Period second</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol mg/100 ml</td>
<td>49.33 ± 9.87</td>
<td>46.33 ± 9.87</td>
<td>57.6 ± 12.44</td>
<td>58.0 ± 6.0</td>
<td>69.66 ± 5.45</td>
<td>66.0 ± 3.05</td>
</tr>
<tr>
<td>Triglycerides mg/100ml</td>
<td>22.66 ± 1.66</td>
<td>23.33 ± 1.85</td>
<td>27.66 ± 1.66</td>
<td>21.0 ± 2.88</td>
<td>21.66 ± 2.60</td>
<td>22.66 ± 2.33</td>
</tr>
<tr>
<td>Total protein g/100ml</td>
<td>8.90 ± 0.05</td>
<td>7.86 ± 0.52</td>
<td>8.53 ± 0.96</td>
<td>7.46 ± 0.53</td>
<td>10.60 ± 2.48</td>
<td>9.66 ± 0.67</td>
</tr>
<tr>
<td>Glucose mg/100 ml</td>
<td>45.66 ± 2.96</td>
<td>56.33 ± 7.31</td>
<td>46.66 ± 2.18</td>
<td>53.66 ± 8.74</td>
<td>55.33 ± 3.71</td>
<td>48.33 ± 7.63</td>
</tr>
<tr>
<td><strong>Period three</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol mg/100 ml</td>
<td>51.33 ± 4.48</td>
<td>51.33 ± 6.76</td>
<td>41.0 ± 7.37</td>
<td>60.66 ± 5.20</td>
<td>57.66 ± 7.42</td>
<td>46.33 ± 6.43</td>
</tr>
<tr>
<td>Triglycerides mg/100ml</td>
<td>26.0 ± 2.64 c</td>
<td>20.33 ± 1.45 c</td>
<td>21.66 ± 2.66 c</td>
<td>30.33 ± 4.70 b</td>
<td>30.66 ± 1.85 b</td>
<td>39.33 ± 1.45 a</td>
</tr>
<tr>
<td>Total protein g/100ml</td>
<td>8.66 ± 0.88 cb</td>
<td>7.53 ± 0.78 cb</td>
<td>8.46 ± 0.26 cb</td>
<td>10.53 ± 0.96 b</td>
<td>10.06 ± 0.58 b</td>
<td>13.53 ± 0.74 a</td>
</tr>
<tr>
<td>Glucose mg/100 ml</td>
<td>49.0 ± 7.54 ab</td>
<td>44.33 ± 2.18 b</td>
<td>53.0 ± 1.73 ab</td>
<td>56.33 ± 4.70 ab</td>
<td>50.33 ± 7.53 ab</td>
<td>64.33 ± 2.96 a</td>
</tr>
</tbody>
</table>

### Table 2: General Mean ± Standard error of chromium effect in lipoproteins of Awassi lambs

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Control</th>
<th>300 μg Chromium Yeast</th>
<th>300 μg Chromium Yeast</th>
<th>600 μg Chromium Yeast</th>
<th>300 μg Chromium Yeast</th>
<th>300 μg Chromium Yeast</th>
<th>300 μg Chromium Yeast</th>
<th>300 μg Chromium Yeast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period First</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>high-density lipoprotein (HDL) mg/100 ml</td>
<td>46.0 ± 15.14</td>
<td>47.0 ± 3.78</td>
<td>55.0 ± 9.29</td>
<td>41.0 ± 0.57</td>
<td>57.0 ± 13.05</td>
<td>54.66 ± 3.17</td>
<td>56.66 ± 2.84</td>
<td></td>
</tr>
<tr>
<td>low-density lipoprotein (LDL) mg/100 ml</td>
<td>6.53 ± 3.95</td>
<td>5.86 ± 1.45</td>
<td>8.53 ± 1.20</td>
<td>5.60 ± 1.33</td>
<td>13.20 ± 3.78</td>
<td>7.46 ± 0.63</td>
<td>7.60 ± 2.35</td>
<td></td>
</tr>
<tr>
<td>very low-density lipoprotein (VLDL) mg/100 ml</td>
<td>6.53 ± 2.43</td>
<td>4.53 ± 0.88</td>
<td>4.86 ± 0.33</td>
<td>6.26 ± 1.04</td>
<td>6.20 ± 0.57</td>
<td>6.80 ± 2.66</td>
<td>7.26 ± 0.58</td>
<td></td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Period Second</th>
<th>high-density lipoprotein (HDL) mg/100 ml</th>
<th>low-density lipoprotein (LDL) mg/100 ml</th>
<th>very low-density lipoprotein (VLDL) mg/100 ml</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>69.0 ± 5.85</td>
<td>23.80 ± 9.90 a</td>
<td>4.53 ± 0.33</td>
</tr>
<tr>
<td></td>
<td>51.0 ± 12.22</td>
<td>7.60 ± 2.80 b</td>
<td>4.66 ± 0.37</td>
</tr>
<tr>
<td></td>
<td>67.66 ± 11.46</td>
<td>12.46 ± 5.73 ab</td>
<td>5.53 ± 0.33</td>
</tr>
<tr>
<td></td>
<td>60.0 ± 5.29</td>
<td>6.20 ± 1.52 b</td>
<td>4.20 ± 0.57</td>
</tr>
<tr>
<td></td>
<td>69.33 ± 13.42</td>
<td>11.06 ± 0.43 ab</td>
<td>4.33 ± 0.52</td>
</tr>
<tr>
<td></td>
<td>67.33 ± 13.77</td>
<td>16.26 ± 0.76 ab</td>
<td>4.53 ± 0.46</td>
</tr>
<tr>
<td></td>
<td>63.33 ± 1.76</td>
<td>8.20 ± 3.51 ab</td>
<td>4.20 ± 0.0</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Period Three</th>
<th>high-density lipoprotein (HDL) mg/100 ml</th>
<th>low-density lipoprotein (LDL) mg/100 ml</th>
<th>very low-density lipoprotein (VLDL) mg/100 ml</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>59.33 ± 3.48 ab</td>
<td>15.16 ± 2.89 a</td>
<td>5.20 ± 0.52 bc</td>
</tr>
<tr>
<td></td>
<td>60.0 ± 4.35 ab</td>
<td>6.70 ± 1.49 b</td>
<td>4.06 ± 0.29 c</td>
</tr>
<tr>
<td></td>
<td>48.66 ± 7.21 ab</td>
<td>10.40 ± 3.16 ab</td>
<td>4.33 ± 0.53 c</td>
</tr>
<tr>
<td></td>
<td>63.66 ± 2.60 a</td>
<td>6.03 ± 0.86 b</td>
<td>6.06 ± 0.94 b</td>
</tr>
<tr>
<td></td>
<td>59.66 ± 8.95 ab</td>
<td>11.80 ± 1.61 ab</td>
<td>6.13 ± 0.37 b</td>
</tr>
<tr>
<td></td>
<td>58.0 ± 4.16 ab</td>
<td>11.90 ± 0.47 ab</td>
<td>7.86 ± 0.29 a</td>
</tr>
<tr>
<td></td>
<td>43.66 ± 3.48 b</td>
<td>7.93 ± 2.13 b</td>
<td>6.53 ± 2.33 ab</td>
</tr>
</tbody>
</table>

The different letters within one row showed significant differences (P <.05).

**Conclusion**

Chromium addition with different sources (Chromium Yeast, Chromiumpicolinate, Chromium Chloride) and different concentrations 300, 600mg diet lambs Awassi effect significant in:

1. Increased concentration of triglycerides, glucose and total protein at the end of the experiment (90 days after addition.
2. Decrease concentration of low-density lipoproteins at the center and end of the experiment (60 and 90 days after addition.
3. Increased concentration of high-density lipoproteins at the end of the experiment (90 days after addition.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

**REFERENCES**


Postoperative Analgesic Effect of Pudendal Nerve Block Following Anterior and Posterior Vaginal Wall Repair

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ABSTRACT

Background: Pudendal nerve block (PNB) provides anesthesia and analgesia for minor gynecological surgeries.

Aim: To determine the effectiveness of PNB in providing postoperative analgesia for patients undergoing anterior and posterior vaginal wall repair (APR) under spinal anesthesia.

Materials and Method: When 50 adult patients, aged 25-50 years, ASA physical status I and II were scheduled for Anterior and posterior vaginal repair and involved in this study. Spinal anesthesia was performed and at the end of surgery, patients were divided randomly into two equal groups. In bupivacaine group (group B), local anesthetics (0.5 ml/kg bupivacaine 2.5%) had been given in three equal divided volumes for an ultrasound guided pudendal nerve block, skin infiltration to the vulva and deep infiltration to the perineum. In control group (group C), the same volume of normal saline had been given. Pain was assessed by using the visual analogue score (VAS).

Results: Prolonged duration of postoperative analgesia and reduced total analgesic dose in Bupivacaine group than control group were observed.

Conclusion: PNB provides a satisfactory postoperative analgesic effects and reduces the need for opioid consumption.

Keywords: Bupivacaine, Pudendal nerve block, Anterior and posterior vaginal wall repair, Postoperative analgesia.

Introduction

Anterior and posterior vaginal repair (APR) is a surgical procedure that had been used for the treatment of pelvic organs prolapse [(1,2)]. Pudendal nerve (PN) block is one of several techniques used to provide anesthesia and analgesia to the genital area and reduces the need for opioid consumption postoperatively with their associated side effects.

PN originated from 2nd, 3rd and 4th sacral rami and pass through the lesser sciatic foramen between two ligaments and then directed into the pudendal canal near the ischial tuberosity (3). Within the pudendal canal the nerve divides into:

1. Inferior rectal nerve (inferior haemorrhoidal nerve): In about fifty percent of cases, it is arise directly from the 4th anterior sacral primary ramus and supplies the anal mucosa and perianal region.

2. Dorsal nerve of penis or clitoris

3. Perineal nerve that supplying vulva and perineum⁴⁻¹¹. Apart from the branches of pudendal nerve, the ilioinguinal nerve also send branches to the mons pubis and labia majora¹².
Therefore, the ideal method to produce a complete nerve block for APR surgeries should include the blocking of the areas that supplied directly inferior rectal and ilioinguinal nerves together with PNB \(^{12}\).

The objective of the current study is to evaluate the postoperative analgesic effect of intraoperative pudendal block for patient undergoing Anterior and posterior vaginal repair.

**Materials and Method**

This study was applied from 1\(^{st}\) of February 2018 to 1\(^{st}\) of March 2019 when 50 adult patients, aged 25-50 years, ASA physical status I and II were scheduled for Anterior and posterior vaginal repair and involved in this study.

Exclusion criteria from this study include: Patients with ASA physical status > II, patients receiving analgesics, allergy to local anesthetics, refusal of the patient, history of bleeding tendency, neuropathies, diabetes mellitus, hypertension, pregnant women, infection at the site of infection and immune compromised patients.

Informed consent was taken from all the patients who were divided into two groups randomly.

An Intravenous (IV) access was inserted in both groups and received 10 ml/kg ringer lactate solution immediately prior to spinal anesthesia. Standard monitoring include lead II electrocardiogram, pulse oximetry and non-invasive blood pressure monitor. Spinal anesthesia was performed using gauge 25 spinal needle at L\(_3\)-L\(_4\) interspace with patients in the sitting position and using 2.5% bupivacaine 0.5%. Patients remained in the sitting position for 4 minutes then placed in lithotomy position and surgery (APR) was done. Vital sign was monitored and recorded at 0, 15, 30 and 60, 90, 120 and minutes following spinal anesthesia. At the end of surgery, patient were divided randomly into two equal groups. In bupivacaine group (group B), local anesthetics (0.5 ml/kg bupivacaine 2.5%) had been given in three equal divided volumes for an ultrasound guided pudendal nerve block, skin infiltration to the vulva and deep infiltration to the perineum. In control group (group C), the same volume of normal saline had been given. Pain was assessed by using the visual analogue score (VAS) \(^{13}\) in which a score of 0 indicates no pain and a score of 10 worst pain. The VAS measurements were obtained every three hours post-operatively at 3, 6, 9, 12, 15, 18, 21 and 24 hours. Rescue analgesic in the form of slow IV bolus of 50 mg of tramadol was administered at the VAS score of 4. Time of first rescue analgesic and the total analgesic during the first 24 hours post-operative period were recorded.

**Statistical Analysis:** The analysis was carried out with the SPSS program; version 23. The qualitative data had been analyzed by using of Chi - square. The quantitative data had been analyzed by using student’s paired t-test was used. VAS were analyzed by the Friedman test.

**Results**

Demographic parameters (age and sex) revealed that there was no significant difference in both groups. The mean duration of surgery was 79.55 ± 19.58 minutes in Group C while it was 75.22 ± 21.33 minutes in Group B which is statically not significant (table 1).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group (C)</th>
<th>Group (B)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>37.45 ± 10.80</td>
<td>34.05 ± 10.01</td>
<td>0.332</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>75.52 ± 8.80</td>
<td>72.90 ± 7.72</td>
<td>0.411</td>
</tr>
<tr>
<td>Duration of surgery (minutes)</td>
<td>79.55 ± 19.58</td>
<td>75.22 ± 21.33</td>
<td>0.352</td>
</tr>
</tbody>
</table>

There was no significant difference between both groups regarding the mean changes in heart rate and mean blood pressure during 0,15,30,, 90,120 and 180 minutes following spinal anesthesia (table 2).

**Table 1: Age, body weight and duration of surgery**

<table>
<thead>
<tr>
<th>Time (minute)</th>
<th>0</th>
<th>15</th>
<th>30</th>
<th>60</th>
<th>90</th>
<th>120</th>
<th>180</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>94 ± 13</td>
<td>77 ± 10</td>
<td>88 ± 10</td>
<td>64 ± 12</td>
<td>93 ± 13</td>
<td>72 ± 11</td>
<td>92 ± 13</td>
</tr>
<tr>
<td>B</td>
<td>87 ± 15</td>
<td>73 ± 8</td>
<td>90 ± 12</td>
<td>62 ± 8</td>
<td>88 ± 11</td>
<td>76 ± 6</td>
<td>84 ± 10</td>
</tr>
<tr>
<td>P value</td>
<td>0.425</td>
<td>0.44</td>
<td>0.321</td>
<td>0.423</td>
<td>0.401</td>
<td>0.430</td>
<td>0.396</td>
</tr>
</tbody>
</table>

**Table 2: Heart rate and mean arterial blood pressure in both groups during 0, 15, 30, 90, 120 and 180 minutes following spinal anesthesia (C = control group, B = Bupivacaine group)**
Regarding the onset of pain, was much earlier in Group C. Mean of VAS was higher in group C > B. There was no significant difference between the two group regarding VAS at 3rd postoperative hour. The maximum mean of VAS score occur at 6th in control group, while it occurs at 12th in bupivacaine group. There was significant difference between the two group regarding VAS at 6th, 9th and 12th postoperative hours (table 3 and figure 1). Total dose of analgesic (tramadol in mgs in 24 hours) was very significantly lower in group B than group C. (table 4).

Table 3: Comparison of visual analogue score (VAS) between both groups. SD: Standard deviation, Group C (control), Group B (bupivacaine). +++ p<0.001 -highly significant, ++ p<0.01 -very significant, + p<0.05 (0.02- 0.05)-significant, (NS) p>0.05-not significant

<table>
<thead>
<tr>
<th>Time (hours)</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
<th>15</th>
<th>18</th>
<th>21</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>C (mean ± SD)</td>
<td>1.5 ± 1</td>
<td>4.3 ± 1.2</td>
<td>3.7 ± 1.2</td>
<td>2.8 ± 0.9</td>
<td>2.4 ± 0.6</td>
<td>2.1 ± 0.3</td>
<td>2.3 ± 0.5</td>
<td>1.8 ± 0.7</td>
</tr>
<tr>
<td>B(mean ± SD)</td>
<td>1.3 ± 0.8</td>
<td>2.4 ± 1.1</td>
<td>2.7 ± 0.8</td>
<td>2.1 ± 0.5</td>
<td>2.1 ± 0.5</td>
<td>1.8 ± 0.5</td>
<td>2.1 ± 0.4</td>
<td>1.7 ± 0.5</td>
</tr>
<tr>
<td>P value</td>
<td>NS</td>
<td>+++</td>
<td>++</td>
<td>+</td>
<td>NS</td>
<td>NS</td>
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<td>NS</td>
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</tbody>
</table>

Table 4: Total dose of analgesic (tramadol) in milligram/24 hours postoperatively in control group (C group) and bupivacaine group (B group)

<table>
<thead>
<tr>
<th>Total dose of analgesic (tramadol) in mgs in 24 hours.</th>
<th>Group C</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>88.55 ± 15.25</td>
<td>35.45 ± 12.88</td>
<td>&lt; 0.01</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Pain scores in control and bupivacaine groups

Figure 2: Total dose of analgesic (tramadol) in milligram/24 hours postoperatively in control group (C group) and bupivacaine group (B group)
Discussion

This study is focused on the impact of pudendal nerve block on the outcome of pain control after APR surgeries. There was significant difference between the two group regarding VAS at 6th, 9th and 12th postoperative hours with prolonged duration of postoperative analgesia and reduced total analgesic dose in Bupivacaine group than control group. O’Neal et al (14) supported our study although their study focused on paracervical block. Aissaoui (15) and his colleague agree with the current study. They found that intraoperative pudendal nerve block can reduce post-operative pain intensity and their required analgesic doses. Ismail and his colleagues found that bilateral injection of local anesthetics by using nerve stimulator result in a reduction in the post-operative visual analogue score and rapid return to normal activity(16).

Conflict of Interest: there is no conflict of interest by the authors

Source of Funding: Self

Ethical Clearance: Taken from the scientific committee of the Iraqi Ministry of health

REFERENCES

Correlation of Nurse Compliance to the Implementation of Hand Hygiene at Undata General Hospital, City of Palu, Indonesia

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ABSTRACT

Nosocomial infection or currently better known as Health-Care Associated Infections (HAIs) is the most important cause of hospitalized mortality and morbidity. The hands of health workers are the most common carriers of microorganisms from one patient to another and from the contaminated environment to the patient. Hand hygiene is the most important measure in preventive measures because it is more effective and has low cost. The purpose of this research was to analyze the correlation of behavior determinant with compliance of nurse hand hygiene at Ward Room of Undata Palu Hospital, Indonesia. This research used cross sectional design study with observational method, interview, and questionnaires. Data on compliance of hand hygiene obtained through direct observation with questionnaires and interviews to nurses at ward room of Undata Palu General Hospital. This research conducted from July to August 2017 at ward room of Undata Palu Hospital, City of Palu, Central Sulawesi, Indonesia. There was a significant correlation between high predisposing factors, enabling factors, and reinforcing factors for implementation of hand hygiene (p < 0.05). Continued efforts to understand and improve hand hygiene compliance among hospital workers, including monitoring success after implementation of identified initiatives to promote recommended practice are essential to help reduce the impact of the spread of hospital infections particularly beneficial to the health of patients in the hospital who are at high risk.

Keywords: determinants of behavior, nurses, compliance, hospitals

Introduction

There are five important issues related to hospital safety: patient safety, worker safety or health care workers, building safety and hospital equipment that may impact on patient safety and personnel impacting on environmental pollution and associated hospital safety with the survival of the hospital. Patient safety is a top priority to implemented and related to quality issues and hospitalization image (1). Therefore, related to patient safety, the World Health Organization (WHO) has campaigned for patient safety programs one of them is by lowering the risk of nosocomial infections (2,3).

According to Regulation of the Minister of Health of the Republic of Indonesia No. 1691/MENKES/PER/VIII/2011 on patient safety, there are 6 patient safety goals. One of them is the reduction of risk of infection related to health services. Infection is common in all forms of health services including urinary tract infections, infections of the bloodstream, and pneumonia (4).

According to WHO, nosocomial infection is the presence of invisible infections in patients while in hospital or other health facilities (5). Those currently known as Health-Care Associated Infections (HAIs) are the most important causes of infection rates, but it can be reduced by nearly 32% in hospitals that have infection prevention and control programs, such as professional
behavior involved. The hands of health workers are the most common carriers of microorganisms from one patient to another and from the contaminated environment to the patient with the impact of reduction on HAIs reaches 50% (6).

In Indonesia, HAIs reached 15.7%, well above developed countries ranging from 4.8 to 15.5% (7). At the Yogyakarta hospital, the incidence of HAIs in general was 5.9% (8). Study on the Efficacy of Nosocomial Infection Control (SENIC) conducted at hospitals in the United States to calculate infection rates, it found that hospitals with strong surveillance and prevention/control programs showed the lowest rates of nosocomial infections (9,10).

WHO states that the nosocomial infection rate will decrease by 24% if hand washing compliance from bad behavior (60%) to be better (90%) (11). According to data of HAIs surveillance by the Committee for Prevention of Infection Control of Undata Hospital of Central Sulawesi Province from January to December of 2016, the incidence of Regional Infection Operation in the 1st Quarter was 2.8% (13 events), in 2nd Quarter of 14.2% (64 events) and in the 3rd Quarter of 6.2% (22 events).

The purpose of this research was to analyze the correlation of behavior determinant with compliance of nurse hand hygiene implementation at ward room of Undata Palu Hospital, City of Palu, Indonesia. Therefore, the researcher interested to examine about “Correlation of Nurse Compliance to the Implementation of Hand Hygiene at Undata General Hospital, City of Palu, Indonesia”.

Materials and Method

This research used cross sectional design study with observational method, interview, and questionnaires. Data on compliance of hand hygiene obtained through direct observation with questionnaires and interviews. This research conducted from July to August 2017 at ward room of Undata Palu Hospital, City of Palu, Central Sulawesi, Indonesia. The population in this study was all the nurses. The sample used nurses in Lotus Room (30 respondents). The research sampling technique used total sampling. The behavioral determinant data consisted of predisposing factor data, enabling factors, and boosting factors (include answers strongly agree, agree, disagree, and strongly disagree with the statement that has provided).

Data on hand hygiene implementation of respondents used the parameters of “Five Moments of Hand Hygiene” consisted of questions that must answered ‘yes’ or ‘no’.

The categories of behavioral determinants included predisposing factors, enabling factors, and reinforcing factors with their respective categories (high : score ≥ 62.5% and low : score < 62.5%). Coagulation test used was chi square correlation test to know the relationship between variables.

Results

Table 1 based on gender characteristics indicating that almost (90%) of respondents were female and almost 70% of respondents have recent education 3-year diploma.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
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<td>n</td>
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<td>---</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Woman</td>
<td>27</td>
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<tr>
<td>Man</td>
<td>3</td>
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<tr>
<td>Total</td>
<td>30</td>
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<tr>
<td>Last Education</td>
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<tr>
<td>3-year diploma</td>
<td>21</td>
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<tr>
<td>Bachelor degree</td>
<td>9</td>
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<tr>
<td>Total</td>
<td>30</td>
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</tbody>
</table>

Table 2 shows the frequency distribution based on the determinants of behavior. In the table shows that from 30 respondents, more than most (83.3%) of respondents had high predisposing factors in the implementation of hand hygiene. Likewise with the enabling factors where more than most (83.3%) of respondents had a high enabling factors in the implementation of hand hygiene. However, the lower figure appeared to be reinforcing factors, but it is not significant that 80% of respondents had high reinforcing factors in the implementation of hand hygiene.

<table>
<thead>
<tr>
<th>Behaviour Determinants</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>n</td>
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<tr>
<td>Predisposing Factors</td>
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<tr>
<td>High</td>
<td>25</td>
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<td>Low</td>
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<td>Total</td>
<td>30</td>
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<td>Enabling Factors</td>
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<td>High</td>
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<td>Low</td>
<td>5</td>
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<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
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Conted…

**Table 3: Relationship of Behaviour Determinants with Compliance Hand Hygiene Implementation**

<table>
<thead>
<tr>
<th>Behaviour Determinants</th>
<th>Hand Hygiene Implementation</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obedient</td>
<td>Disobedient</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Predisposing Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>24</td>
<td>96.0</td>
<td>1</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
<td>20.0</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>83.3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Enabling Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>25</td>
<td>100.0</td>
<td>0</td>
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<tr>
<td>Low</td>
<td>0</td>
<td>0.0</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>83.3</td>
<td>5</td>
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<tr>
<td><strong>Reinforcing Factors</strong></td>
<td></td>
<td></td>
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<tr>
<td>High</td>
<td>24</td>
<td>100.0</td>
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<tr>
<td>Low</td>
<td>1</td>
<td>16.7</td>
<td>5</td>
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<tr>
<td>Total</td>
<td>25</td>
<td>83.3</td>
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**Discussion**

The results showed that there was a significant relationship between high predisposing factors to compliance to the implementation of hand hygiene with \( p < 0.05 \). This is because respondents understand the importance of hand hygiene implementation which is one of the main key in prevention and control program of nosocomial infection. In accordance of the research in M.H. Thamrin Salemba Hospital in Indonesia is a factor of lack of knowledge of nurses about technique and five times of hand hygiene implementation, higher workload while less human resources, still lack of sink count, and long distance \( (16) \). The nurses are placed at appropriate level in terms of knowledge, attitude, and performance but to increase their knowledge by holding training classes and courses, especially for hand hygiene in which nurses had less knowledge \( (12) \).

Respondents who have low predisposing factors are disobedient in the implementation of hand hygiene due to the time of education nurse/midwife has not got the concept of theory and how to prevent nosocomial infection correctly consequently they has not been able to prevent that infection to the maximum when it starts working. In fact the lack of awareness of hand washing
is the high mobility of nurses and physicians because it is practically easier to wear gloves, however they are negligent to wash hands before and after use\textsuperscript{(13)}.

The result of statistical test proved that there was a significant correlation between enabling factors and the implementation of hand hygiene with $p < 0.05$. Based on the observation of the researcher, respondents who had high enabling factors to be obedient in the implementation of hand hygiene. This was due to the availability of handrub in each treatment room to make the respondent obedient in the implementation of hand hygiene and the nurses will also report to the procurement department if handrub in one of the empty/unfilled space, while the respondent had low enabling factors so it was disobedient in the implementation of hand hygiene caused respondents feel unsuited to the handrub available due to a pure alcohol-based antiseptic mixture that created a stinging smell and feels hot in the hand and sticky.

Based on the research\textsuperscript{(13,14)}, one factor, which allows nurses to comply with handwashing policies, includes availability and accessibility of resources to perform hand hygiene procedures. ICU of Port of Spain General Hospital has nine beds with one isolation room that has its own washtafel; eight other beds in open units with four washtafels, giving 2:1 bed and sink ratios. There are also six automatic hand sanitizers mounted on the wall placed inside the open unit and one in the isolation room.

The result of the research there was a relationship between reinforcing factor with the implementation of hand hygiene with $p < 0.05$. ICU of Eric Williams Medical Sciences Complex (EWMSC) is a five bed unit that has a ratio with a washtafel of 5: 2. The availability of washtafel for nursing staff is a good motivation for hand washing as it allows them to perform tasks as often as they need them. Another results showed that nurses in medical ICUs had 1: 1 beds with a washtafel ratio for a higher hand washing percentage of 76%, than those in surgical ICU who had a bed-to-bed ratio 4:1 washtafel which the percentage was 51\%\textsuperscript{(13,14)}.

The result of the research showed there was a relationship between reinforcing factor with the implementation of hand hygiene with $p < 0.05$. All of respondents who had high reinforcing factors were obedient in the implementation of hand hygiene. This was due to the hospital conduct supervision related to the implementation of hand hygiene compliance to the nurses and also gives sanctions to the nurse who was caught not running hand hygiene procedure when contact with the patient. In addition, the hospital also always reminds the nurse through loudspeakers to perform hand hygiene before contact with patients. Meanwhile, respondents who had low reinforcing factors were disobedient in the implementation of hand hygiene caused when handling emergency conditions, nurses feel the procedure hand hygiene troublesome, lazy factors, dead water or damaged tap.

This is in line with previous research that states all health workers should have been able to apply hand hygiene in five moments\textsuperscript{(16)}. Administrative orders, continuous observation, performance feedback, increasing the supplies necessary for health workers and institutional support can improve hand washing practices\textsuperscript{(15),(16)}.

**Conclusion**

Continued efforts to understand and improve hand hygiene compliance among hospital workers, including monitoring success after implementation of identified initiatives to promote recommended practice are essential to help reduce the impact of the spread of hospital infections particularly beneficial to the health of patients in risky hospitals high.

**Ethical Clearance:** Our study was not directly applied on human, hence ethical clearance was not required.

**Source of Funding:** Self funding.

**Conflict of Interest:** The author declare that he has no conflict of interest.

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Parenthood Experiences of Immigrant Women Married to Korean Men: A Qualitative Study

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ABSTRACT
Immigrant women married to Korean men experience a lot of conflict and confusion while raising their children due to differences in values and cultures. This study takes a qualitative approach, seeking to examine the parenthood experiences of the subjects. The study involved a total of eight participants, from age 23 to 46. The data were collected through a focus group interview after the participants underwent the Parent Education Program for Married Immigrant Women (PEMI). Four categories were derived after an analysis of the results: “wounds from parenting stress”, “gaining confidence in child rearing”, “a hidden barrier: it power”, and “communication among family members”. Married immigrant women saw themselves as competent beings as parents, learned more knowledge on child-rearing and gained confidence in performing a parent’s role. This led to an improvement in awareness and a desirable change in their child-rearing attitude, while their families experienced a positive transfer.

Keywords: Immigrant, Women, Parenthood, Experiences, Qualitative

Introduction
Demographic diversity has been growing significantly in Korean society as marriage- and labor-related immigration to Korea increases rapidly. The 2016 foreign residents survey found that there were a total of 932,235 immigrant women married to Korean men, and over 90% of them were Asians. An increase in international marriage-related immigration leads to an increase in the number of children born to multicultural families. According to Korean statistics from 2016, children of multicultural families made up 4.5% of the total number of children born in 2016. The number of multicultural children is expected to rise as there is an increasing number of foreign residents in Korea. Multicultural children experience a lot of conflict and confusion due to the differences in their parents’ values and cultures, and their linguistic development can be slowed by their parents’ different languages and child-rearing practices.Externally, they may experience being ridiculed and ostracized due to prejudice against them, or experience inequality and feelings of alienation. For this reason, it is significantly meaningful to take an interest in how immigrant women married to Korean men raise their children, as it can help raise healthy future generations of Korean society.

Immigrant women married to Korean men may not understand their children’s behavior or may have conflicts with them because they are raising children in a completely different environment from what they grew up in. In this condition, they experience parenting stress, which can affect their interactions with their children because it undermines the functions of parents and families and increases their children’s problematic behaviors. A child’s problem behavior affect the mother’s stress level, which in turn, makes the mother have a negative parenting attitude. This negative parenting attitude causes further problem behaviors from the child, forming a vicious cycle. For this reason, immigrant women married to Korean men...
desperately need to establish their roles as mothers in Korean society, which is becoming more diverse and is changing rapidly.

Immigrant women married to Korean men experience a parent role in Korea through the parenting experience they have in the Korean society. As strong models for children and adolescents, parents not only determine their children’s personality formation and the quality of their interpersonal relationships but also affect their socialization process in which they obtain the behavior rules, values and morality required by society. In particular, a parent’s role is important in defining the relationship between parents and children in order for immigrant women married to Korean men to overcome their special conditions, adapt to a new environment and take care of their families as the mother. Therefore, this study intends to conduct a qualitative analysis on their social and child-rearing experiences after having participated in a parent education program.

Method

Study Participants and Data Collection: Study participants were collected from among immigrant women married to Korean men who were residing in Korea through marriage, who wanted to participate in the Parent Education Program for Married Immigrant Women (PEMI), could communicate in Korean and understand and answer the survey questions, and had lived in Korea for four years or longer. They were collected through a convenience sampling method for qualitative research with the help of a multicultural family support center. The PEMI is a revised and supplemented version of the “Parent Empowerment Program for Married Immigrant Women,” developed by Kim (2013). There were a total of six sessions, each lasting 120 minutes. There were a total of eight female participants aged 23 to 46. Five were in their 30s, two were in their 40s and one was in her 20s. As for their nationalities, there were two Japanese participants, one Chinese, three Filipinos and two Vietnamese. The questions for the focus group interview included the following: “How do you raise your children?”; “What difficulties did you have when raising your children?”; “In what particular area did your family members have different opinions?”. Participants indicated their voluntary participation in this study and submitted their written consent. All participants were given a small amount of money as an honorarium ($30).

Data Analysis

The participants’ adaptation to parenthood was analyzed by following Downe-Wamboldt (1992) steps for content analysis research: deciding the unit of analysis, deriving categories and definitions, and defining categories and modifying rules. This researcher transcribed the interview and a research assistant edited the transcription. The interview was transcribed by both this researcher and the research assistant, and the conformity was checked in order to increase the accuracy of the transcription.

Results

1. Wounds from Parenting Stress

   1. Insufficient preparation to become a mother:
      Participants had double difficulties: child-rearing and education difficulties. In particular, when they were not prepared for motherhood, their negative experience as children affected their parenting attitudes. This, in turn, caused problem behaviors from their children, forming a vicious circle.

      “It’s been over four years since I came to Korea. My husband has a child already, an elementary school student. I don’t have much experience. It is somewhat difficult. I can’t even manage my life there well. I have to know many things to raise children. I sometimes meet other mothers at the center. I cannot meet them often. When the child throws a tantrum and is stubborn, I just keep screaming, like own my parents did...” (Participant 4)

   2. A sense of being dispirited by a different language and culture:
      Participants worried a lot that their children might not be able to adapt to school life because they were different from Korean children. Participants also felt dispirited because their Korean was not fluent. They found themselves withdrawing when trying to help children with homework and schoolwork. This prevented some of them from forming a bond and properly communicating with their children. They felt guilty for not being able to assist in their children’s schoolwork and education due to their poor Korean language ability. They also said that they had difficulty because their husbands did not cooperate in their children’s education.
“I want to be the best mother in the world. I wish I could speak good Korean and cook well, but it wasn’t easy. My husband does not help me. I am from a foreign country so my children may appear a little different from their classmates. It is not so obvious but their appearance can be a bit different. So they may be socially ostracized by their friends. As a parent, I am worried a lot about their relationships with their friends.” (Participant 5)

2. Gaining Confidence about Child-Rearing

1. Learning new child-rearing information:
   Married immigrant women with preschool children had difficulty dealing with their children’s distraction and stubbornness, while those with school-aged children had difficulties related to conversation, computer use and their children being truthful. Although they learned that their children had their unique characteristics in the parent participation program, they still had no idea how to raise children according to their characteristics. But they said that they became more confident about child-rearing after learning about children’s developmental stages and emotional and behavior problems.

“I watched a TV program about spoiled children who would not listen to their parents but changed little by little. I want to learn how to do that. So I eagerly watch the program. I’d like to know what kind of hobbies will fit my children at their ages. But when my children keep fighting each other, it just gives me a headache and I feel stressed. I don’t know if I should scold my children when they lie to me. I don’t know what to do, so I ask other mothers participating in the program. These days, my children are curious about sex, so I often talk about this with other mothers.” (Participant 1)

2. Seeing children positively: Participants did not speak fluent Korean and had communication problems with their children, which made them withdrawn. But they learned that not only communication but also having an interest in and caring about children’s needs can be a good approach. This helped them build an improved relationship with their children, they said. They also said that they felt less anxious about their children’s problem behaviors and that they could accept their children as they were instead of trying to raise children in their ways. They attempted to solve problems through conversation according to their children’s situation, and could see the positive sides of their children.

“My son was losing things and did not pack things he should bring to school. This gave me a hard time, and I even wished that I did not have a son. When I got angry, I yelled at him, scolded him and slapped him with hands. I talked a lot with him. And I tried to find good things about my children. When my children bring their friends home, I make them sweet and sour pork and other snacks. My children eagerly eat the food I make and brag about it to their friends. My children like their mother and compliment my cooking, which I don’t realize before.” (Participant 2)

3. A Hidden Barrier: IT Power: It has been reported that in Korea, married immigrant women have difficulty guiding their children’s studies, and this researcher could not agree more with this statement. But in particular, information technology education was a more threatening element to the participants than linguistic and cultural differences. Korea has one of the highest levels of access to multimedia of any country in the world, and Korean children and mothers are often adept at using computers and software systems. And at school, classes continue to utilize computers and students are required to perform assignments by using a computer. Information technology education has emerged as another obstacle that threatens the child-rearing of married immigrant women, who begin at a different ‘starting line,’ so to speak, than Korean mothers.

“Immigrant mothers have to be adept at using computers in order to take care of their children’s studies. Teachers post notices on the bulletin board. Those mothers who do not know about this miss things that their children need.” (Participant 6)

4. Communication among Family Members:
   Participants all shared the characteristic of having gone through marriage-related immigration.
Although there were small personal differences, they all experienced the social isolation and difficulties caused by linguistic barriers. In particular, many of the participants felt withdrawn when they tried to communicate due to their pronunciation and spelling errors, and their inability to properly use connective suffixes. This enabled them to experience a change in the relationship with their children at home.

“I tried to nag less, made concessions to my children, thought a lot about my family and talked a lot with them. I hope I can talk better, but after learning that good listening is an important part of conversation, I often would initiate a conversation with my children and listen to them. There is more conversation and laughter in my family now, and there’s much less quarreling.” (Participant 8)

**Discussion & Conclusion**

Just as each country has different practices and culture, each married immigrant woman will have different convictions about the parent’s role. This means that the parent’s role for married immigrant women needs to be newly established in the fast-changing Korean society. “A parent’s role” has had various meanings in previous studies, but the “parenthood” of married immigrant women has not been correctly defined.

Parenthood is a process that requires ceaseless efforts to maintain a good relationship with children by learning information and knowledge on children’s growth, while developing a sense of responsibility to raise children. When a parent performs this process well, the parent can develop confidence about performing a parent’s role, have a more comfortable relationship with the children and feel higher satisfaction with their role. A parent is indispensable to his or her children’s growth and development. Behind competent children, there is a parent who works for the child’s intellectual development, and seeks to satisfy the child’s social needs.

However, married immigrant women have difficulty raising their children due to differences in child-rearing practices and culture. These difficulties were highlighted in Obounou and Mpelega’s study, which studied 16 reviews about immigrant women married to Korean men. Married immigrant women experience not only linguistic communication difficulties but also difficulties in guiding their children’s studies. They pay a lot of attention to child-rearing, which is helpful, but they still find it difficult to guide their children’s studies at an advanced level. And it is considered that Korea’s overheated environment of early and private education adds to their confusion regarding a parent’s role.

Married immigrant women’s husbands do not have a particular interest or get directly involved in their children’s education. In this poor environment, the weight on married immigrant women in playing the role of parent is heavy. Previous studies show that this heavily weighted role causes difficulties to married immigrant women because they arrive in Korea without sufficient education on Korean culture, and thus have to raise their children before they have established values about a desirable role for a parent, or prepared related knowledge or skills. They also have limited authority to play their role as a parent and to express their thoughts and convictions as a decision maker in the family.

Parenthood should be seen as not a static state, but a process of continuous expansion. There are limitations encountered when we attempt to understand the parenting role played by married immigrant women from a traditional Korean perspective. Married immigrant women have to raise and educate their children in a culture that is different from the one in which they grew up, and in a multicultural environment that does not offer their native language education or child-rearing practices. This requires more expert resources in communities who can help them change for themselves and develop as parents, and most of all, who can give them clear answers when they are confused as they try to set a standard point for their children’s role in child-rearing.

This study has some limitations. The changes in the participants’ child-rearing occurred within Korean society, and thus the results of this study are confined to Korea geographically. Because married immigrant women in other countries do not have the same experiences, it is difficult to generalize the results of this study. This difficulty exists because the parenthood process continues while parents are engaged in a learning process. However, the efforts of this study are expected to provide a foundation for understanding the parenthood of married immigrant women, as there are a growing number of married immigrant women and their children are growing into members of Korean society.
Further studies on the parenthood adaptation model of married immigrant women should be conducted in the future, and related theories may be formed based on the data of this study.

**Ethical Clearance:** Taken from Gwangju Multicultural Family Support Center

**Source of Funding:** Self

**Conflict of Interest:** NA

**REFERENCE**


Development Green Consumerism E-Book for Undergraduate Students (GC-EBUS) as Learning Media in Environmental Learning

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ABSTRACT

This study aimed to develop the Green Consumerism E-Book for Undergraduate Students (GC-EBUS). The novelty offered in this study is the development of a book specifically discussing green consumerism for undergraduate students, which has never been developed before. This research was conducted in November 2018 - March 2019. The research method used is the research and development method development model Borg and Gall which consists of conducting needs analysis, designing media, developing media, and conducting media validation, in this study not yet tested try the effectiveness of the media in the field. GC-EBUS was develop in Indonesian language. The average total validation score obtained is 3.33 which is very valid. This showed that GC-EBUS is suitable for use in classroom learning. The conclusion of this study is that green consumerism books for undergraduate students developed are suitable for use in learning.

Keywords: e-book, green consumerism, learning environment, learning media, research and development, undergraduate students

Introduction

One of the concepts that put forward the concept of consuming environmentally friendly materials is what is called green consumerism. In principle, green consumerism is an understanding where one must prioritize various environmental interests in terms of what he consumes¹–³. Examples of cases, for example in terms of shopping, for people with high green consumerism will put forward to buy goods that are more environmentally friendly. Even though the price to be paid is higher, he will still try to buy it, to maintain the environment for the better.

The understanding of people about green consumerism is still not deep, especially for people who live in developing countries like Indonesia. Green consumerism concepts are also very minimal understood by students who already have a high level of thinking. This is because when they go to school, they are not given enough knowledge about this. This resulted in their low pro-environmental behavior⁴–⁶.

As an effort to improve the understanding of undergraduate students on green consumerism, learning materials need to be provided. This learning material can be delivered through learning media. This is very helpful, especially to convey environmental material to undergraduate students from various majors both from natural sciences or social sciences⁷,⁸.

Previous research related to learning media and the environment usually directed the media to improve Biology learning outcomes. Researchers usually only focus on improving learning outcomes⁹,¹⁰. Also, previous research usually carried out action research based on what cases were in the class. In this case, for example, student learning outcomes in environmental pollution material are low. Then the teacher conducts
action research and uses existing learning media such as video, chart, and power point as an effort to improve student learning outcomes\textsuperscript{11,12}.

In this research the novelty offered is the development of the Green Consumerism E-Book for Undergraduate Students (GC-EBUS). Books like this are classified as products that are rarely developed because most people only develop media that contain material on environmental pollution in general. In this book, special content is only discussed about green consumerism in more detail. Besides that, another novelty offered is in this book also given environmentally friendly aspects, this is a novelty of this research.

Based on these problems it is necessary to develop learning media in the form of e-books to help provide knowledge to students from various walks of life. The book developed must also have characteristics that can facilitate the various backgrounds of students who study the book\textsuperscript{13-15}. This study aimed to develop the Green Consumerism E-Book for Undergraduate Students (GC-EBUS) for students in Social science and natural science.

Method

The research was conducted in November 2018 - March 2019. The research method carried out in this study was the media development method of Borg and Gall models with modification stages. The stages are (1) conducting a needs analysis (2) Designing media (3) developing GC-EBUS Media (4) Doing expert validation. In this study, only the development process was carried out, and it has not been continued to test the effectiveness of learning media (16). Experts involved in this study are lecturers, teachers and undergraduate students as users. The validation categories used are as stated by Ratumanan & Laurens (2006) as follows in table 1.

<table>
<thead>
<tr>
<th>Table 1: Learning media validation criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval Category</td>
</tr>
<tr>
<td>3.25 ( &lt; x \leq 4.00 )</td>
</tr>
<tr>
<td>2.50 ( &lt; x \leq 3.25 )</td>
</tr>
<tr>
<td>1.75 ( &lt; x \leq 2.50 )</td>
</tr>
<tr>
<td>1.00 ( &lt; x &lt; 1.75 )</td>
</tr>
<tr>
<td><strong>Source:</strong> Ratumanan &amp; Laurens (2006)</td>
</tr>
</tbody>
</table>

At the stage of the needs analysis, a study was conducted through literature and direct observation, and it was found that the learning media in the form of e-books had never been developed before. At the stage of media design, a media design was started which consisted of storyboards and design layouts of the products. GC-EBUS was develop in Indonesian language. During the development phase, it was carried out for two months and obtained a GC-EBUS product which was then validated to media and material experts and undergraduate students.

Findings and Discussion

Based on the results of the research that has been done, the results of the validation show that the developed GC-EBUS has a valid category and gets positive values from experts. This category shows that the media developed is suitable for use in classroom learning. As for more details can be seen in table 2.

<table>
<thead>
<tr>
<th>Table 2: Results of media validation developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>Average</td>
</tr>
</tbody>
</table>

The experts provide an assessment by the quality of the product being developed. Each expert provides his own assessment with various indicators of assessment. In more detail, the results of evaluations from media experts and material experts in each aspect can be seen in tables 3 and 4 below.

<table>
<thead>
<tr>
<th>Table 3: Results of Learning media expert validation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
</tbody>
</table>
Table 4: Results of Learning material expert validation

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Item</th>
<th>Average Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Material accuracy</td>
<td>1,2,3,4</td>
<td>3.50</td>
<td>Very Valid</td>
</tr>
<tr>
<td>2.</td>
<td>according to regulations</td>
<td>5,6,7,8,9,10</td>
<td>3.83</td>
<td>Very Valid</td>
</tr>
<tr>
<td>3.</td>
<td>Material Update</td>
<td>11,12</td>
<td>3.00</td>
<td>Valid</td>
</tr>
<tr>
<td>4.</td>
<td>Use of language</td>
<td>13,14,15,16</td>
<td>4.00</td>
<td>Very Valid</td>
</tr>
</tbody>
</table>

The experts involved in addition to providing assessments also provided various inputs so that the media developed could be improved. Some entries can be seen in the table below.

Table 5: Comments on media experts and material experts

<table>
<thead>
<tr>
<th>No.</th>
<th>Learning media expert</th>
<th>Learning material expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>the layout still needs to be fixed</td>
<td>It needs more deepening and enrichment of material concepts</td>
</tr>
<tr>
<td>2.</td>
<td>Use of letters, large letters</td>
<td>Material systematics to be more continuous</td>
</tr>
<tr>
<td>3.</td>
<td>Use of color</td>
<td>Strengthening and focusing material</td>
</tr>
<tr>
<td>4.</td>
<td>Some pages are still unclear (blurred)</td>
<td>Examples or illustrations of material concepts</td>
</tr>
</tbody>
</table>

In addition to media experts and material experts involved in validation. In this study, validation was also carried out to undergraduate students. The goal is that the learning media used are input from undergraduate students who will later become users of the learning media. The results of media validation based on undergraduate students can be seen in table 6.

Table 6: Results of validation from undergraduate students

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Item</th>
<th>Average Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Completeness of material</td>
<td>1,2</td>
<td>3.40</td>
<td>Very Valid</td>
</tr>
<tr>
<td>2.</td>
<td>Material presentation</td>
<td>3,4,5,6,7,8</td>
<td>3.35</td>
<td>Very Valid</td>
</tr>
<tr>
<td>3.</td>
<td>Use of language</td>
<td>9,10,11,12</td>
<td>3.12</td>
<td>Valid</td>
</tr>
<tr>
<td>4.</td>
<td>display</td>
<td>13,14,15,16,17,18,19</td>
<td>3.34</td>
<td>Very Valid</td>
</tr>
<tr>
<td>5.</td>
<td>Benefit</td>
<td>20,21,22,23,24</td>
<td>3.78</td>
<td>Very Valid</td>
</tr>
</tbody>
</table>

The results of the media that have been validated and developed are then made an improvement process based on input from various experts. Repairs were carried out for two weeks. The results of the improvement and development of the book can be seen in Figure 1 and Figure 2.

Figure 1: Front cover view and introduction page of GC-EBUS

Figure 2: GC-EBUS content page
Based on products that have been developed, there are several advantages of GC-EBUS which are the hallmarks of other learning books. In this book, there are various drawings that are interesting and support an explanation of various concepts regarding the environment. This interesting image can make undergraduate students more enthusiastic in learning it\textsuperscript{18,19}. Another advantage is that the size of the book is relatively small, just the size of an A5 paper, which makes the book easy to use and lightweight. GC-EBUS also has advantages because it can be used in various devices such as smartphones, laptops and tablets. This is very in line with the development of the age where learning is no longer dependent on distance, because learning can be anywhere\textsuperscript{20–22}.

The material presented in GC-EBUS is also relatively easy to understand. In GC-EBUS, the material developed consisted of 6 aspects namely Energy Conservation, Transportation, Waste Avoidance, Consumerism, Recycling, Vicarious, Social Behavior\textsuperscript{23}. In the aspect of using language, there is no confusing vocabulary in this book. This is so that readers who come from various departments can read it. The sentence delivered is also directly in essence and not convoluted. of course, this will make it easier for undergraduate students to understand environmental learning material\textsuperscript{24,25}.

The development of GC-EBUS is very useful in learning, especially for wide spreads. Environmental learning gained in the classroom when at school is felt to be insufficient so that additional material is needed for undergraduate students so that they better understand the material available. Especially for undergraduate students from social sciences programs where they are not too deep in the concepts of nature. Book development is also felt to increase knowledge of student behavior. Student’s environmentally friendly behavior can be improved by using various learning media\textsuperscript{26–28}. Undergraduate students who read this book are invited to preserve nature and protect nature. Although indeed other treatments need to be given, not only this book. This book also provides various facts about the environment, this makes people more rational in taking action and protecting their environment\textsuperscript{4,5}.

GC-EBUS in learning is one form of innovation in learning media. That is because all this time the textbook has a rigid, boring, and rather difficult to understand. This book is different from books that are already on the market. GC-EBUS will make undergraduate students more enthusiastic in learning. Undergraduate students will also be more active in learning, this will have a good impact on learning. The activities of undergraduate students in the classroom using this book will change their knowledge in understanding the environment towards a better direction\textsuperscript{29,30}.

Besides using GC-EBUS, this is for undergraduate students in the class. We can also combine this media with other learning media such as videos. This is because the video is sufficiently proven to be able to improve student learning outcomes and also can improve various student abilities needed in 21st-century learning\textsuperscript{31–33}. Videos combined and can also be taken from various sources such as the internet. This is because in the digital era like now using the internet is a habit of undergraduate students\textsuperscript{34–36}.

Conclusion

Based on the results of the study, it can be concluded that GC-EBUS has a valid category and is suitable for use in classroom learning. This book has various advantages, such as the information delivered is brief but clear so that it is easy to understand. This is very suitable for the characteristics of readers, namely undergraduate students from various majors in science and social science undergraduate students.

Acknowledgements

Thank you to the validators, media experts, and material experts who have been involved in this research. Thanks also to the Indonesian Ministry of Research, Technology and Higher Education (Kemenristekdikti) for helping with funding from this research. Without support from various parties, this research will not work well.

Conflict of Interest: There is no conflict of interest

Source of Funding: Indonesian Ministry of Research, Technology and Higher Education (Kemenristekdikti)

Ethical Clearance: verbal approval was obtained from students and learning expert as participant in this study

REFERENCES


Chemical Contaminants of Water Resources to Neurological Symptoms of Population around Cipayung Landfill Depok, West Java

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ABSTRACT

Introduction: There was a report of increase in the levels of heavy metals (Ag, Pb, Cd, Cu, Fe and Zn) between 214% and 2040% in the soil around the landfill. Long-term disposal of municipal waste can affect the nature and productivity of land around municipal waste disposal sites. This study aimed to analyze the relationship of lead and mercury levels in water sources to complaints of neurological abnormalities of residents around Cipayung landfill.

Method: A cross sectional study was conducted between September-October 2018 with a sample of 88 people. Data were collected by interview using questionnaire and water samples were tested in Indonesian Center for Biodiversity and Biotechnology (ICBB). Data were analyzed using logistic regression to achieve the fit model.

Results: Logistic regression showed a weak relationship between mercury levels and complaints of neurological symptoms with POR = 1.422 (95% CI 0.328-6.159). While all water source samples contained lead levels around 0.08 mg/L which was likely to have been contaminated.

Discussion: The effect of mercury levels on water sources to complaints of neurological disorders symptoms was found to be weak and the possibility of lead levels has exceeded TLV. Residents around Cipayung landfill are suggested to not using ground water as their drinking water.

Keywords: lead, landfill, neurological symptoms, mercury, environment

Introduction

Indonesia’s population growth will also increases consumption which generate to increasing in the amount of solid waste generated from activities so that effective waste disposal is needed. The open dumping method and the accumulation of waste used in Indonesia at the landfill has resulted in a decrease in the quality of the environment due to air pollution which are resulted to the burning of solid waste and groundwater pollution which endangers communities around the landfill ¹².

Indonesia is the second place as a contributor to plastic waste and produces tens of millions of tons annually. In 2015, Indonesia produced garbage 0.7 kilograms/person/day. With 250 million people, 175,000 tons of waste produced are produced every day, reaching 64 million tons/year. The Cipeucang landfill covering an area of 2.5 hectares was expected to run out of space in the end of 2016, while the Bantar Gebang landfill receives 6,700 tons of waste per day each year ³.

Groundwater contamination by landfill is known. There was an increase in the levels of heavy metals (Ag, Pb, Cd, Cu, Fe and Zn) between 214% and 2040% in the soil around the landfill. Long-term disposal of municipal waste can affect the nature and productivity of land around municipal waste disposal sites ⁴５.

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Heavy metals have adverse effects on soil, agriculture, and human health\(^1\). Solid waste from landfill can also increase nitrogen levels, pH, cation exchange capacity, percentage of base saturation, and organic matter\(^1\). Long-term disposal of municipal waste can affect the nature and productivity of land but can still be used for agriculture because the eco-toxic risks associated with its use continue to be assessed and controlled.

Heavy metal in the soil due to contaminated landfill waste causes chronic cancer, decreased nerve function, bone abnormalities, and infertility. Whereas in children pollutant particles from landfill enter through breathing and digestion. The impact of lead on drinking water causes depression, decreased appetite, gastric complaints, muscle pain, weakness, dizziness, abdominal cramps, fertility, miscarriage, nervous system damage\(^{16}\). The impact of contaminants is very influential on vulnerable populations such as infants, children, pregnant women, parents, individuals with a history of serious illness, or other subpopulations at greater risk than the general population\(^7\).

The problem of waste management, especially in areas that are for final disposal sites, has not found effective management in several countries. Organic material contributes a volume of 50-90% including kitchen scraps and food (food scraps, rotten fruit, vegetables, leaves, crop residues, animal excretion, and bone). Organic waste can rot and become fertilizer. However, the problem is, it is still rare for countries to effectively manage organic waste. For inorganic waste, reuse efforts are preferred in waste management avoiding water and soil pollution\(^5\).

The existence of landfill greatly affects the quality of groundwater of the surrounding population. Studies in Cameroon show cadmium concentrations in water sources 0.48-7.64 mg/kg, Cu range 38.3-236 mg/kg, nickel 44.06-58.03 mg/kg, lead 117-528 mg/kg, zinc 270-2110 mg/kg\(^5\). Contamination of water by metals or heavy metals was also found in Nigeria around open dumping indicated containing Cd between 0.65–0.80 mg/kg, besides SO4\(^8\). Short-term exposure to high concentrations of metal or long-term accumulation of metal contamination in water can cause symptoms of poisoning in humans such as increased blood pressure, headaches, impaired memory and concentration and fertility problems.

Increasing the volume of solid waste at Cipayung Landfill from 2004 to 2018 has experienced a significant increase. The waste has reached 30 meters in height. While the distance between the landfill and the residents’ housing is around <500 meters. This condition is very possible to affect the quality of drinking water from local residents, which in the long term can reduce the quality of health. Based on informal interviews with residents around the landfill, the ground water sources have experienced changes in color, smell, and taste during the rainy season. Since the establishment of the Cipayung Landfill until 2018 there have been no studies that measure the water quality of residents around 1 kilometer in radius and assess the quality of their health through symptoms of neurological disorders in residents due to water pollution.

Cipayung landfill is operated with an open dumping system in an area of 2.5 ha. The expansion of the 10.6 ha Cipayung landfill was due to an increase in volume. The waste disposal system is upgraded to a controlled landfill. There is a settlement of Kampung Bulak, Cipayung Village, with a distance of about <500 meters from the TPA center. Residents use ground water for washing activity, cooking and drinking water. However, many complain about the well water experiencing changes in taste, color and smell, especially in the rainy season. Research conducted at other landfills has proven that most of the residents’ wells have been contaminated\(^1\). Therefore, the community around the Cipayung landfill are high risk in health problems mainly due to groundwater pollution from landfill leachate. Measurements of cadmium, chromium, lead, and mercury from water sources around other landfills have been carried out, but there has never been a study linking the water quality of the local residents in the landfill with the health of its residents. Furthermore, this study aimed to analyze the levels of lead and mercury in the water sources of residents around Cipayung TPA against complaints of neurological disorders.

**Method**

A cross sectional study was performed between August and October 2018 for residents living in a radius of 1 km from TPA Cipayung, Depok. The closest house is at a distance of <500 meters. This location was chosen because the volume of solid waste is increasing every year. There is a possibility that local residents have experienced water pollution from physical, chemical, and inorganic pollutants due to the large volume of waste.

The eligible population of study were residents aged >17 years and a maximum of 60 years who lived around the Cipayung landfill within a radius of 1 km for...
at least 6 months when data were collected. Proportional sampling was used to collect 88 residents who lived in a radius of 500 meters, 600 meters, 700 meters, 800 meters, 900 meters and 1 kilometers. Data were analyzed using logistic regression.

The concentration of lead (total) in well water samples was analyzed at the Indonesian Center for Biodiversity and Biotechnology (ICBB). The number of samples for each radius is determined proportionally. Distance of wells with landfill was measured by the global positioning system (GPS). Well water samples were collected from a depth of 20 cm from the surface of the water and packaged in a 1 liter acidified plastic bottle with two drops of concentrated HNO3. The water samples were then analyzed by inductively coupled plasma atomic emission spectroscopy. The cut-off point is used to categorize the independent variables based on the threshold value (NAB) of the Minister of Health Regulation of the Republic of Indonesia Number 492/Per/IV/2010 concerning drinking water quality requirements.

Ethical Clearance: The Health Research Ethics Committee Universitas Pembangunan Nasional Veteran Jakarta approved the study protocol (No. B/1617/X/2018/KEPK). Before interviewing, the researcher explained the purpose of the study to each of the participants. Written informed consent was obtained from all participants on a voluntary basis.

Result

The levels of heavy metals tested in this study were lead and mercury. The test results for all water samples showed that it contained lead around 0.08 mg/L. While the results of mercury test of all samples varied and were categorized based on the threshold value (NAB) of 0.001 mg/L. The prevalence of complaints of neurological disorder symptoms in Cipayung Village was 23.86%, while the lead levels of all samples were still below the NAB of 76.14%.

The majority of residents did not have any history of neurological diseases (96.59%), the type of drinking water did not meet the requirements (52.27%) so they has the potential to be contaminated with heavy metals from landfill protection, the type of clean water resource did not meet the requirements (62.50%). The highest proportion of demographics aspects showed that occupation was not risk of neurological symptoms (87.50%), occupational history was not risk factor (60.23%), mild smokers (88.64%), monthly income was no differences between both categories, normal BMI (52.27%), education did not graduate until junior high school (63.64%), length of employment <5 years (76.14%), and age <36.5 years (51.14%).

Based on crude results obtained from 21 subjects who suffered from neurological complaints, there were 28.57% whose the mercury levels in the water resource exceeded TLV (POR = 0.562; 95% CI 0.372-4.652). Only the drinking water, water resource, and the occupation showed a significant in the level significance at 0.05 in crude to the complaints of neurological disorders with each POR were 0.940, 5.686, and 0.738. Body mass index (BMI) found to be an increase a risk in people under the category of underweight, overweight, and obesity in complaints of neurological disorders. While other variables did not found as a risk for complaints of neurological disorders.

The effect of mercury exposure in water resources on complaints of neurological disorder symptoms in Cipayung Village population needs to be controlled by confounding variables statistically like work history and BMI, but drinking water and water resource remain included in the model because it is considered to have substantial effect. The magnitude of the effect of mercury in residents’ water resources on neurological symptoms after being controlled by those confounding variables was 1.422 (95% CI 0.328-6.159). Based on those result, the effect of mercury on water resources into complaints of neurological symptoms was not very clear.

Table 1: Model of mercury level model to neurological symptoms in around Cipayung landfill area, Depok

<table>
<thead>
<tr>
<th>Variable</th>
<th>POR</th>
<th>Std Error</th>
<th>Z Score</th>
<th>P value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury level</td>
<td>1.422</td>
<td>1.063</td>
<td>0.47</td>
<td>0.638</td>
<td>0.328-6.159</td>
</tr>
<tr>
<td>Occupation history</td>
<td>0.738</td>
<td>0.412</td>
<td>-0.54</td>
<td>0.587</td>
<td>0.247-2.205</td>
</tr>
<tr>
<td>BMI</td>
<td>1.519</td>
<td>0.380</td>
<td>1.67</td>
<td>0.095</td>
<td>0.930-2.481</td>
</tr>
<tr>
<td>Drinking water</td>
<td>0.940</td>
<td>0.758</td>
<td>-0.08</td>
<td>0.939</td>
<td>0.193-4.566</td>
</tr>
<tr>
<td>Water resource</td>
<td>5.686</td>
<td>5.617</td>
<td>1.76</td>
<td>0.079</td>
<td>0.819-39.423</td>
</tr>
<tr>
<td>House distance to landfill</td>
<td>1.252</td>
<td>0.860</td>
<td>0.33</td>
<td>0.743</td>
<td>0.326-4.811</td>
</tr>
</tbody>
</table>
Discussion

Lead levels of all samples probably have exceeded the TLV because they showed lead content around 0.08 mg/L. This number has exceeded the TLV stipulated in the Regulation of the Minister of Health of the Republic of Indonesia No 32 of 2017 which is 0.05 mg/L. The result was different from the study at the Namobintang landfill which showed the lead content was still below TLV. The mercury threshold value was 0.001 mg/L and there were several samples that passed this value. Mercury and lead in contaminated food and beverages will be accumulates in several body parts such as hair and can be used as biomarkers.

Results of the lead test for all samples were homogeneous so it could not be analyzed. Whereas the results of the analysis of mercury level to neurological symptoms were found to be 1,422 (95% CI 0.328-6,159) which showed a weak effect after being controlled by work history, BMI, drinking water, water resource, and house distance to landfill. In addition, 95% CI passed the null value so that the possibility of results was influenced by chance. There were also possibilities that these results are underestimated caused by non-differential misclassification.

In accordance with the theory and results of several studies, chronic exposure of mercury can cause abnormalities in the central nervous system (such as mental retardation, deafness, blindness, speech disorders) and kidney damage. The most frequently reported exposure to mercury is long-term exposure with low level exposure.

House distance to the landfill was one of the factors that influenced the mercury level of water resource. Our result showed that the closer to the landfill, the smaller the risk for complaints of neurological disorders. This was probably due to the behavior of most subjects and population there who feel that their water resources are not appropriate for drinking or sanitation, so they use water sources from other locations (piped water systems) or refill water. The distance of 0-500 meters should be a buffer zone for protection for residents who carry out daily activities around the landfill and prevent the impact of leachate on the population. Whereas a radius of <100 meters from the outermost site boundary of the landfill must be a green belt, a space with many trees so that it should not be used as a water source for any purpose.

The use of ground water in radius between 0-800 meters to the landfill is not permitted.

The limitations of this study were the number of samples. It is recommended for further research to increase the number of samples and increase power statistics. If there was information bias, there tends to be non-differential misclassification because there was no difference in treatment between groups.

Conclusion

The prevalence of complaints of neurological symptoms in population of Cipayung Village was still low at 23.86%. The results of testing the levels of lead in the water source of the residents of all samples may exceed the threshold limit value which were around 0.08 mg/L. The range of mercury levels in the water sources of population of Cipayung Village is <0.0001 – 0.0011 mg/L. The relationship of lead levels in water sources to complaints of neurological disorders in residents around Cipayung landfill could not be analyzed because all samples contain the same lead levels. The relationship between mercury levels and complaints of neurological abnormalities in residents around Cipayung landfill was weak (POR = 1.422; 95% CI 0.328-6.159)

Conflict of Interest: There no conflict of interests of this study.

Source of Funding: The original data were collected with funding from Research and Community Development Center of Universitas Pembangunan Nasional Veteran Jakarta

REFERENCES


Comparison of Simulation Method and Animation Video on Knowledge Related to Preparedness of Elementary School Students in Ternate, Indonesia

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ABSTRACT

Ternate location which passed by Pacific Ring of Fire made the area of Ternate have a high risk of experiencing volcanic eruptions. School as one of the stakeholders is responsible for improving the preparedness of students. Students are the most group vulnerable to disasters. Preparedness in reducing disaster risk that possessed by students is still relatively low, thus requires training for students to deal with disasters that cannot be predicted when it occurs. This study aimed to analyze the effectiveness of simulation and animation video methods in improving the knowledge related to preparedness among students. This study used pre-test posttest with control group design. The population in this study were fifth and sixth-grade students from four different schools which in the disaster-prone area in Ternate, North Maluku. Total respondent in this study was 90 respondents that were selected using purposive sampling technique, then divided into two groups: simulation and animation video methods. Data of knowledge and attitude variables were collected before and after training using a questionnaire. Data collected from this study were analyzed using the Wilcoxon and Mann Whitney tests (α=0.05) with SPSS 20. The result of this study was shown that there was a significant difference in knowledge between the two groups before and after an intervention. Both groups shown an improvement mean score in knowledge (from 5.02 to 7.38) Similarly, the video group (5.27 to 6.67, p=0.000). Comparison between the two methods shown that the simulation method obtained higher knowledge than the video method with a mean rank of 55.44 vs. 35.56 (p=0.000).

Keywords: knowledge, preparedness, simulation, animation video

Introduction

Geographically, Indonesia is a region that has the largest number of volcanoes in the world. Geologically, Indonesia is among the three world’s plates, those are Eurasian, Indo Austria, and Pacific Ocean Plate¹. This condition causes the tectonic and volcanic activity is very high and have active faults which are mostly found under the sea, thus potentially resulting in a volcanic eruption².

Ternate is one of the areas in Indonesia which has active volcanoes. This is because Ternate is included in The Ring of Fire Area¹. This condition indicates that Ternate has a high risk of experiencing the effects of volcanic eruptions³. Volcanic eruptions have occurred in Ternate in 2012 which caused 7 people dead, 10 lose, and 284 people displaced, but it also, there is damage in residential areas and public facilities such as roads, bridges, and schools. The incident has rightly become a lesson for the whole of society and government⁴.

Several schools in Ternate located in disaster-prone areas with a radius of ± 4km from the mountain ⁴. This condition indicates the location of the school is very risky to the threat of volcanic eruption. Children are one of the most vulnerable populations during disasters, especially if they are in school⁴. Therefore, the safety of children in schools became the focus of attention of
global security efforts. The Hyogo Framework for Action 2005-2015\(^6\) and The Sendai Framework for Disaster Risk Reduction 2015-2030\(^7\) has prioritized safety and security in a comprehensive school consisting of three pillars, namely; safe learning facilities, school disaster management, and DRR and resilience education.

The low preparedness of students in terms of disaster risk reduction both in terms of knowledge, attitudes, and actions make preparedness as an important element for disaster risk reduction that is pro-active \(^8,9\). Efforts should be made towards disaster risk reduction is to increase preparedness someone who is part of the disaster management\(^10\). To build such a culture requires innovative interventions, economic, logical, human-oriented and demand-oriented\(^11,12\).

One of the stakeholders who are responsible for building this culture is school because of its strategic role in building the preparedness in facing disaster, especially for students\(^13\). The Student is a strategic objective to disseminate information among the public and the sources of knowledge in improving preparedness\(^14\) Indonesia, in terms of safety of school location, disaster management and disaster education. The findings indicate that 56\% of public elementary schools in Banda Aceh City are exposed to high tsunami risk, and most externally driven school disaster preparedness activities were not continued by the schools due to lack of ownership, institutional arrangement and funding. The study proposes the minimum essentials to reactivate school disaster preparedness activities and strongly recommends the local government’s policy support for ensuring a city-wide, all-schools implementation. These essentials should include an annual school plan that involves conducting a tsunami evacuation drill at least once per year and a school budget for conducting disaster preparedness activities. To ensure smooth implementation, the Education Agency Circular Letter should provide justification for all headmasters to include these components in the schools’ annual plans. It also recommends that external parties who donate or provide physical equipment (e.g., tsunami evacuation routes or maps. The purpose of this study was to compare the methods to improve the preparedness of students’ knowledge among methods of simulation and animation video.

**Method and Material**

The method used in this study was quasi-experimental with a pretest-posttest control group approach. This research was conducted in January and February 2019 at Public Elementary School of 61, Public Elementary School of 62, Public Elementary School of 64 and Public Elementary School of 70 Ternate, North Maluku, Indonesia. The population in this study were 127 students and 90 respondents were selected using purposive sampling technique with inclusion criteria: fifth and sixth-grade students, had never participated in disaster preparedness training of volcanoes, then respondents were divided into two groups: groups of simulation and animation video.

Each group has a different treatment. The simulation group was facilitated by trained personnel of the Regional Disaster Management Agency (BPBD) of Ternate with applying the method of role-playing with the scenario of an event when the volcano erupted at the school. Actions taken included: how to recognize the warning signs of volcano erupted, the action is taken when a disaster
occurs while in school, evacuation drills, and toward the interim blunt point. All circuit simulation needed 45 minutes. In the video group of students invited to watch a video animation “disaster preparedness volcanoes” that lasted ± 7 minutes, which included images, text and an explanation of the formation of a volcano, volcanic eruptions, and preparedness to face eruptions. Informed consent was given to all participants prior to the study. This data acquisition phase was divided into two phases. First, pretest conducted for both groups, second, intervention phase and posttest.

This study used a questionnaire as an instrument of knowledge that consisted of 9 questions. Validity and reliability of the questionnaire were performed by involving 20 respondents with the same characteristics as the subject of research. Validity and reliability revealed that correlation of corrected item total for all items of questions was > r table (0.444) and Cronbach’s alpha value of 0.84. Data were tested by Friedman with Post Hoc Wilcoxon and Mann Whitney. Statistical analysis was performed using SPSS 20.

### Results

**Table 1: Characteristics of Respondents based on Gender, Class, and Experience in Joining Simulation**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group</th>
<th>Simulations</th>
<th>Video</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Category</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>24</td>
<td>53.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>21</td>
<td>46.7</td>
</tr>
<tr>
<td>Age</td>
<td>11 years old</td>
<td>22</td>
<td>48.9</td>
</tr>
<tr>
<td></td>
<td>12 years old</td>
<td>23</td>
<td>51.1</td>
</tr>
<tr>
<td>Class</td>
<td>Fifth grade</td>
<td>12</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>Sixth grade</td>
<td>32</td>
<td>71.1</td>
</tr>
<tr>
<td>Experiences in Joining Simulation</td>
<td>Has never been</td>
<td>21</td>
<td>46.7</td>
</tr>
<tr>
<td></td>
<td>Never 1 times</td>
<td>24</td>
<td>53.3</td>
</tr>
</tbody>
</table>

According to Table 1, could be seen that most of the gender of primary school students in the simulation group was male with total students of 24 and animation video, group was female with total students of 23. The most dominant age of primary school students in the simulation group was 12 years old with a total number of 23 people and in the video group was 11 years old with a total number of 25 people. The most dominant of primary school students in a group of simulation and video was sixth-grade students with a total number of 32 and 37, respectively. The most of intervention group (24 people) had 1 time joining the simulation conducted by parties from outside of school, whereas in the control group the majority of students (41 people) had never participated in simulation training.

**Table 2: The Knowledge of Students Before and After The Disaster Preparedness Training Using Simulation and Animation Video**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>Prettest/posttest</th>
<th>Mean</th>
<th>Difference</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Simulation</td>
<td>45</td>
<td>Prettest</td>
<td>5.02</td>
<td>2:36</td>
<td>0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Posttest</td>
<td>7.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video</td>
<td>45</td>
<td>Prettest</td>
<td>5.27</td>
<td>1.4</td>
<td>0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Posttest</td>
<td>6.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shown that both methods affected the knowledge of students before and after receiving the knowledge of disaster preparedness training (p=0.000). The increase knowledge score of the simulation group was higher (2:36) compared with the video group (1.4).
Table 3: Comparison of Knowledge Changes on Simulation Group and Video Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Simulasi</td>
<td>45</td>
<td>55.54</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Video</td>
<td>45</td>
<td>35.56</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 was shown the difference in the improvement of knowledge between the groups of simulation and video. Mann Whitney Test resulted in the p-value of (p = <0.005), explained simulation group was higher.

Finding

Statistical analysis was shown a significant improvement of knowledge in both groups, before and after the disaster preparedness education. This was shown that the method of simulation and video could be useful in improving the knowledge related to preparedness for fifth and sixth-grade students of elementary school. Then, based on the average of difference test in improving the knowledge score between methods of simulation and video, there was a significant difference between the two methods in which the average score of simulation group was higher than video group. This indicated that knowledge related to preparedness given to fifth and sixth-grade students using simulation method was better in improving knowledge than video.

The results were consistent with Unver et al., (2018) which stated that the use of simulation training for disaster preparedness incorporating the knowledge and skills to provide direct experience of the response when disaster strikes as though. These results were consistent with research conducted by Kalanlar, (2018) involving 75 nursing students who demonstrated that increased knowledge and preparedness of disaster-related student in the simulation group compared with the control group.

The simulation method used in this study could be used as one method of effective disaster preparedness training at elementary school students because it could provide a better level of knowledge compared to the video method. This was possible due to the use of video, respondents focused only on impressions that displayed in the LCD (Liquid-Crystal Display). Instead, disaster preparedness training using simulation method of role-playing was providing a direct experience of the trainees in improving preparedness. This process provided convenience to participants in improving the knowledge.

A simulation was a learning experience strategy using mock situations that could provide opportunities for students to practice, develop knowledge and skills in a real disaster situation but still performed in a safe environment. Health care staff and institutions should be prepared to manage these events. The aim of study is to analyze the effects of high-fidelity simulation on the perceptions of senior nursing students regarding their preparedness for disasters. Methods: This study used a pretest-posttest design and was conducted as a quasi-experimental investigation. Results: Slightly less than the half of the students (42.5%). This was in line with the research of Steward & Wan (2010) which stated that simulation in disaster management could measure a person’s readiness to deal with disasters. According to Olson et al., (2014) in his research also stated that education about disaster preparedness using simulations could provide better results than not using simulation. Thus, disaster preparedness training using simulation method was recommended as an effective method to improve the preparedness of elementary school students.

Conclusion

There was a significant difference in the improvement of preparedness-related knowledge among fifth and sixth-grade students in elementary school after receiving disaster preparedness education using simulation and video animation. The result was shown that simulation method was better in improving knowledge compared to the method of animation video. These findings proved that simulation method could be used as an effective method in improving the preparedness-related knowledge in elementary school students. Researchers suggested conducting further research to determine the retention of knowledge with a follow-up period of 30 or 60 days. For nurses could research to improve knowledge as first aid knowledge that could be conducted by students when the disaster occurred.

Conflict of Interest: None

Ethical Clearance: This study has passed the ethical test held at Faculty of Medicine Universitas Halu Oleo with number 2739/UN29.20/PPM/2018

Source of Funding: None
REFERENCE


Low Self-Esteem of Women Suffering *Mayer Rokitansky Kuster Hauser Syndrome*

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**ABSTRACT**

*Mayer Rokitansky Kuster Hauser Syndrome* is a rare disorder suffered by females. Women suffering MRKH cannot have menstruation cycle, cannot have intercourse with her husband, and cannot pregnant, even cannot give a birth to children. This condition puts the women to have lower confidence, to feel inferior, to close and attract themselves from environment because of shame, useless, and feeling to be bad fortune for their family. There are participants in this research got shocked and depressed after realizing their condition. Their low self-esteem is an unappreciated feeling, feeling useless and having low self-esteem due to negative evaluation upon themselves and their abilities. The purpose of this research is to explore self-esteem of those women. The method of this research is qualitative by using interpretative-phenomenology approach. The participants are aged between 19-30 years old. While collecting the data, the researcher used in-depth interview by using structural interview by involving seven participants suffering MRKH. The findings describe the meaning of the participants’ experiences in which they feel inferior, cannot socialize with their friends nor people around them.

**Keywords:** Low Self-esteem, Women, Mayer Rokitansky Kuster Hauser Syndrome

**Introduction**

*Mayer Rokitansky Kuster Hauser Syndrome* or known as MRKH is an inherited disorder occurred on early mature female indicated by the absence of tubes, vagina, and uterus normally¹. The condition is known when a woman is in her early teenager age and does not experience menstruation (amenorrhea primer)². The syndrome is a rare disease with occurring ration 1 to 5000 female baby births around the world. Where they will experience a very burdening condition for a woman to have problems with menstruation, to get involved in intercourse and to give a birth¹. The data gained from Indonesia MRKH community whose 33 members around the world, consisting not only Indonesian citizen but also foreign citizen.

The occurrence of reproduction organ problem of woman can influence the woman’s life because the health of woman’s organ is assumed as completeness identity of a woman⁴. It influences psychological aspect of a woman because the condition of woman suffering MRKH has psychological or emotional trauma and existences of changes toward her self-esteem³.

Low self-esteem is describes as negative feeling toward an individual’s self, included losing confidence and self-esteem². Low self-esteem is unworthy feeling, useless and being inferior due to negative evaluation upon their own self and their abilities. It is also indicated by poor self-treatment, untidy clothing, appetite regression, feeling afraid to face while talking, seeming gloomy, slower and weak speaking⁶. Low self-esteem is included in mental problems.

*World Health Organization* predicts 450 million people around the world suffering mental problems.
There are 10% of adult people suffering mental problems now and 25% of them are predicted to have this problems in certain age during their life. Meanwhile, according to Indonesian Republic Health Department, mental problem reaches 13% of whole disease and is possible to grow into 25% in the end of 2030. In Indonesia, in 2007, the prevalence of the case is 4.6 per mile. It means from 1000 people of Indonesia there are four to five to have mental disorder.

Experiencing low self-esteem is a condition which mental problem occurs on an individual. Mental health is a psychologically and emotionally condition health, related to satisfied interpersonal relationship, behaviors, and effective copes, positive self-esteem and emotional stability. According to Prabowo, mental health is various positive characters to describe harmony and mental balance to reflect an individual’s matureness. Mental problem is a set of interruption on functions, thoughts, emotions, behaviors, and socializations to surrounding people.

**Methodology**

The design of the research is qualitative with interpretative phenomenological approach. The participants are seven persons, adjusted by inclusion criteria determined through purposive sampling. The data collection is done by in-depth interview by using semi-structure guided interview. During interview, the researcher uses field note. After collecting all data, the researcher continues to analyse the data using Interpretative Phenomenological Analysis (IPA). This research was done at Regional Hospital dr. Loekmonohadi, Kudus in January-February 2019

**Findings**

The gained data of this research findings are questions expressed by participants. The expressions are coded and looked based on the arranged keywords and then are grouped based on similar meaning categories. Then, the categories are arranged to get subthemes which later are arranged into themes of research findings. This research describes the meaning that the participants experience confidence regression to cause low self-esteem in which they do not want to communicate to surrounding people.

In this research, several themes are self-seceding, being introvert, feeling inferior, and feeling not to be able to make parents happy. Here are the explanations.

**Self-Seeding:** This sub-theme is taken from social relationship interruption experience theme. It means the participants do not want to interact with their friends due to insecurity upon his or her disease. Here is the excerpt stated by one of the participants:

“I am feeling insecure after realizing what happens to me. When I am at school, I often spend my time to alone, to go canteen alone, to go everywhere alone. Sometime I go to library for reading” (P1)

The statement describes the meaning of the participant’s experience in which he felt insecure, did not feel like to interact with their friends or anyone around him.

**Being Introvert:** This sub theme defines that the participant do not have intention to be with anyone, do not want to be opened upon her condition even to her brothers or friends. Here is the excerpt of the participants’ statement:

“...I occasionally ever felt less confident. Even I did not want to meet my brothers nor family. I just wanted to keep myself locked in the bedroom. I was crying more than 2 weeks” (P2)

“What woman wants to be like this, like my condition? What did I wrong? Until I get this life test? I directly closed myself from boys” (P7)

The statement from some participants describe that the participant was being introvert to her friends, her close friends, her brothers, until her family.

**Feeling Inferior:** This sub-theme is participant’s feeling where she does not feel confident anymore due to her disease. Here is the excerpt:

“Sometimes I feel incomplete and less confident” (P2)

Statement of the participants describes that the participants feel inferior because she does not feel complete anymore after realizing her disease.

**Feeling not to be able to Make Parents Happy:** This feeling is sub-theme of social relationship interruption experience. This sub-theme explains that participants feel incomplete and cannot make her parents happy. It causes herself to be pessimistic and insecure so she limits herself to her surrounding people. Here is the excerpt:
“But sometimes my parents seem crying while praying. It makes me think. Ya Allah, how useless I am (while crying) ....” (P1)

“...sometimes my parents in law asked: ‘Why have not you pregnant?’ They already wanted grandchildren. You know? My husband is the single child. Yaaa.... It is normal if my parents in law wanted to have grandchild. But, what can I do with my current condition?” (P5)

The statement describes the participants do not feel useful because she cannot do anything while looking at her parents sad. It makes her thinking about her parents.

Discussion

Low self-esteem is negative feeling toward an individual self, causing to lost confidence, to be pessimist, and to feel unworthy. Low self-esteem is negative evaluation toward an individual self and her ability followed by poor self-treatment, being afraid to face while speaking, slowly and weakly speaking.

The explanation above is in line with research on women suffering MRKH in which the participants felt lonely, denied, rarely communicate, lack of eye contact, lazy, not have eager to get activity, unsafe and uncomfortable with the existence of surrounding people. However, when the condition is not handled soon, it may cause to have risk of perception sensory changes, such as hallucination in which it is as uncontrollable negative symptom with high risk of committing suicide.

Various special therapies given to patients with low chronic self-esteem covers three categories for: individuals, families, and groups. Therapy of special individual which is able to be given to patients with low chronic self-esteem is Cognitive Behaviour Therapy (CBT) and Logo Therapy. A group therapy which is implementable to patients with low chronic self-esteem is Supportive Therapy and Self-Help Group (SHG).

Some researches about treatments to clients suffering low self-esteem uses method to improve interaction ability of the patients by using Social Skill Therapy. Based on the research, it is gained that cognitive ability and behaviour of the clients intervened by such therapy are improved. The findings show that after the intervention, there was improvement of social skill with average score 65.26 before treatment and became 65.68 after the treatment.

The implementation of Social Therapy Skill done by Harkoma et al with characteristics of the client aged 31 years old for intervention group and 34 year old for control group, having primary school education 65.8%, unemployment 63.2%, unmarried 57.9. The absence of social skill differences of intervention group and control group after being intervened has p-value 0.694. The result of the therapy is 13% not completely done and 87% completely done. From 4 sessions of supportive therapy with 3 sessions done and 100% completely done.

According to Calafell in his research, it states that provisions of SST therapy, clients with social interruption can provide Cognitive Behavioural Therapy (CBT). CBT therapy is effectively proven to improve life quality of young clients but the therapy is not purposed and not suggested for middle age or above. CBT is a basic psychotherapy based on theory of how an individual maintains structure of himself or experience in which majorly determines how an individual feels and acts.

CBT is effective to improve self-esteem and independency of patients suffering breast cancer at Cancer Hospital, Darmais, Jakarta. Kristiyaningsih in her research shows CBT can improve self-esteem of chronic kidney-failure patients whom get haemodialysis therapy at Fatmawati Hospital, Jakarta.

Besides providing therapy to clients with low self-esteem done by medical team, family supports will maximize results of therapy. Family is the closest environment and is always together with the patient. Family is main supporter to recover and cure patients’ low self-esteem.

Conclusion

The role of nurses in giving full guidance and counselling for participants, women suffering MRKH to give morale supports and to recover and develop self-confidence of their own selves is needed. The role of more communicative and friendly nurses in giving treatment to the participants will help them to achieve their self-esteem positively to reach adaptive coping mechanism so it will reach active situation between nurses to constructive participants.
Conflict of Interest: None

Ethical Clearance: This study has passed the ethical test held at Faculty of Medicine Universitas Brawijaya with number 350/EC/KEPK-S2/12/2018

Source of Funding: None

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Major Influencing Factors on Infants Feeding Pattern of Hospitalized Children Under 2 Years, Najaf Governorate-Iraq, 2017

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ABSTRACT

Infant feeding practices are based on many factors; socio demographic factors are the most critical one. To investigate socio demographic factors that influence the infant feeding practices of mothers in Najaf Governorate/Iraq. A cross-sectional study was employed. Mothers who have under two years child participated in the study.

A tested questionnaire of twenty six inquiries was completed and chi-square test was used to associate feeding practices with different socio- demographic characteristics.

Among the mothers, the majority were between the ages of 19-35 years, unemployed, primary educated, and from low socioeconomic status. Mothers who reported having primary education were significantly more likely to exclusively breastfeed than those with higher levels of education. Mother’s socioeconomic statuses, employment status, were also influential in infant feeding practices.

Aim of the Study: To describe the feeding practices of infants below two years of age and determine maternal socio-demographic factors that influences these practices among mothers in Najaf Governorate.

Method: A cross-sectional study involving three hundred ninety five mother- under two years infant pairs hospitalized at Al-Zahraa teaching hospital for maternity and children, Najaf Governorate, during 2016 – 2017 were consecutively recruited after meeting the study inclusion criteria.

Data on breastfeeding were based on infant feeding practice in the previous 24 hours. Exclusive breastfeeding was defined as infant feeding with only breast milk.

Pretested questionnaire is comprised of 26 items include social demographic domain (11 items) Delivery details domain (3 items) , Feeding pattern domain (12 items).

Results: The findings of present study presented that the majority of sample was breast fed (44.3%) , formula feeding (21.8%) and mixed feeding pattern (33.9%). High significant association between mother age and feeding pattern, the frequency of feeding pattern in age group (19-24) P-value 0.002.

Also significant association between mother educational level and feeding pattern P-value 0.018, also it was noticed that there is significant association between mother occupation with feeding pattern P value 0.043.

The study conclude that infant feeding pattern was significantly associated with mother education, income and occupation, mode of delivery and by person who advice to specific pattern of feeding.

Keywords : Breastfeeding, formula, Najaf, infant feeding practices.

Introduction

The World Health Organization recommends “infants should be exclusively breastfed for the first six months of life followed by breastfeeding along with complementary foods for up to two years of age or beyond to achieve optimal growth, development and
According to the WHO recommendations, the appropriate age at which semisolids should be introduced is after 6 months of age while continue breast feeding to meet the increased physiological requirements of growing infant (9) owing to the immaturity of the gastrointestinal tract and the renal system as well as on the neurophysiologic status of the infant (9).

Some of the major factors that affect exclusivity and duration of breastfeeding include breast problems such as sore nipples or mother’s perceptions that she is producing inadequate milk (4), and problem which is affect infant feeding such as refusal to eat, colic, and vomiting. Societal barriers such as employment and length of maternity leave (7), inadequate breastfeeding knowledge, lack of familial and societal support; lack of guidance and encouragement from health care Predictors of breastfeeding (9).

When breast milk or infant formula no longer supplies infants with required energy and nutrients to sustain normal growth and optimal health and development, complementary feeding should be introduced (11) which is both breast milk and other foods or drinks defined as mixed feeding (1). It has been recognized worldwide that breastfeeding is beneficial for both the mother and child, as breast milk is considered the best source of nutrition for an infant (7).

Objectives of the study:

To study feeding practices among hospitalized children under 2 years

Methodology

A cross-sectional descriptive and analytical study carried out over a 10 months period involved all infants under-two years with their mother who admitted to Al-Zahraa teaching hospital for maternity and children in Najaf from 1st of December 2016 to 30th of September 2017.

Three hundred ninety five mother-infant pairs hospitalized in Al-Zahraa Teaching hospital for maternity and children during 2016 – 2017 were consecutively recruited after meeting the study inclusion criteria. Data on breastfeeding were based on infant feeding practice in the previous 24 hours. Exclusive breastfeeding was defined as infant feeding with only breast milk.

The hospital serves the entire Government and also the neighboring communities from the surrounding Governments. It also provides mainly free routine immunization services. Other services rendered include growth monitoring, and counseling in diverse aspects of child survival strategies.

The Inclusion Criteria Includes: All hospitalized children under 2 years of age whose mothers have given informed written consent.

Exclusion Criteria:

(i) All infants delivered prematurely.

(ii) Low birth weight infants.

Data Collection

Data collection was done by the two researchers and two research assistants who often randomly went back to interview the mothers for quality control checks. These were all geared towards ensuring that study criteria were well applied. Before data collection mothers were assured that refusal to participate in the study will in no way affect the welfare services for their infants.

The data collection tool was a pre-tested interviewer administered questionnaire which was completed by questioning the mother and taking measurements of the infants’ weight, length and head circumference. Information was collected regarding parental residence, maternal age, marital status, educational attainment and occupation.

The categorization of the specific infant feeding option practiced by the mother was based on mothers’ past 24 hour dietary recall. Baby’s first feed, everything baby took in the previous 24 hours, reason for stopping breastfeeding etc. were documented. There was also a section that sought to find out whether the mothers ever heard of exclusive breastfeeding, mothers’ knowledge of the weaning, willingness to practice it if given the opportunity and reason for rejecting exclusive breastfeeding.

Statistical Analysis: Percentage, Chi square test, Correlation analysis was conducted to quantify the strength of association among feeding pattern and social demographic variables.
Results

Factors influencing infant feeding practices in the first six months of life: This section looks at the influence of mothers’ characteristics, method of delivery whether spontaneous vaginal delivery, assisted delivery, or caesarean section. Also look for any maternal complications, and looking for newborn baby history on feeding practices.

Table 1, presents data on how these variables of mothers influence infant feeding practices. The percentage of breast feeding practice is found in 53.4% of mothers with spontaneous vaginal delivery. According to maternal complications, respondents with maternal psychosis or post-partum hemorrhage will be less for breast feeding (3% & 2.3%) respectively.

For newborn baby history, it was found that 78.5% of full term babies were breast fed while in preterm or post term it was low (15.4% and 6.1%) respectively.

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage of breast feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous vaginal delivery</td>
<td>211</td>
<td>53.4</td>
</tr>
<tr>
<td>Assisted delivery</td>
<td>13</td>
<td>3.3</td>
</tr>
<tr>
<td>Elective caesarean Section</td>
<td>130</td>
<td>32.9</td>
</tr>
<tr>
<td>Emergency caesarean Section</td>
<td>41</td>
<td>10.2</td>
</tr>
<tr>
<td>Maternal complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal psychosis</td>
<td>12</td>
<td>3.0</td>
</tr>
<tr>
<td>Wound infection</td>
<td>85</td>
<td>21.5</td>
</tr>
<tr>
<td>Post-partum hemorrhage</td>
<td>9</td>
<td>2.3</td>
</tr>
<tr>
<td>None</td>
<td>289</td>
<td>73.2</td>
</tr>
<tr>
<td>Health problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>congenital</td>
<td>40</td>
<td>10.1</td>
</tr>
<tr>
<td>acquired</td>
<td>355</td>
<td>89.9</td>
</tr>
<tr>
<td>Newborn baby history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm less than 37 week</td>
<td>61</td>
<td>15.4</td>
</tr>
<tr>
<td><strong>full term 37- 40 weeks</strong></td>
<td><strong>310</strong></td>
<td><strong>78.5</strong></td>
</tr>
<tr>
<td>post-term 42 weeks</td>
<td>24</td>
<td>6.1</td>
</tr>
<tr>
<td>Total</td>
<td>395</td>
<td>100%</td>
</tr>
</tbody>
</table>

Current Infant Feeding Patterns of the Mothers Interviewed: Mothers interviewed breastfed for varied periods. Meanwhile, other foods (formula, juice, porridge etc.) were introduced at varied times in the first six months of the child’s life.

Table (2) , shows the infant feeding practices of mothers who participated in the study. As shown, the proportion of women who practiced exclusive breastfeeding and formula feeding were 34.0% and 21.8% respectively. The proportion of women who practiced mixed feeding within the first six months of life was 33.9%.

When mothers were asked what food they introduced to their infants in the first six months of life majority were quick to respond that they give water. Their responses are summarized in Table 2.

<table>
<thead>
<tr>
<th>Age of infant</th>
<th>Type of food introduced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No introduction</td>
<td>Water</td>
</tr>
<tr>
<td>6 months &amp; below</td>
<td>3 (5.9%)</td>
<td>82 (36.2%)</td>
</tr>
<tr>
<td>7-12 months</td>
<td>47 (94.1%)</td>
<td>68 (30%)</td>
</tr>
<tr>
<td>13-24 months</td>
<td>0 (0%)</td>
<td>78 (33.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>50 (100%)</td>
<td>228 (100%)</td>
</tr>
</tbody>
</table>
The majority (228 of 395) of respondents give water in addition to breast milk to their infants. As mentioned earlier 50 respondents were exclusively breast feeding, however 56 were giving their babies formula and other home prepared foods. respondents who introduced their infants to water, 36.2% gave their infants water in their first six months of life. Another 30% were still receiving water and breast milk at the ages of 7-12 months (Table 3). Mothers in this category explained that water has been part of our culture as a welcoming drink and as part of our food. Their responses emphasize the importance of water in infant feeding practices.

Table 3: Distribution of current feeding practices by socio-demographic characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Currently feeding practice</th>
<th>Total</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exclusively breastfeeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formula feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Group (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;19</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>63</td>
<td>36</td>
<td>155</td>
</tr>
<tr>
<td>25-29</td>
<td>54</td>
<td>12</td>
<td>95</td>
</tr>
<tr>
<td>30-34</td>
<td>22</td>
<td>20</td>
<td>70</td>
</tr>
<tr>
<td>&gt;35</td>
<td>13</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>172</td>
<td>86</td>
<td>389</td>
</tr>
<tr>
<td>Separated</td>
<td>3</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>No school</td>
<td>67</td>
<td>28</td>
<td>127</td>
</tr>
<tr>
<td>Primary school</td>
<td>60</td>
<td>34</td>
<td>148</td>
</tr>
<tr>
<td>Intermediate</td>
<td>20</td>
<td>11</td>
<td>54</td>
</tr>
<tr>
<td>secondary</td>
<td>19</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>University</td>
<td>9</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>Higher education</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Rural</td>
<td>61</td>
<td>37</td>
<td>139</td>
</tr>
<tr>
<td>Urban</td>
<td>114</td>
<td>49</td>
<td>256</td>
</tr>
<tr>
<td>If employed, state</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office work</td>
<td>70</td>
<td>84</td>
<td>280</td>
</tr>
<tr>
<td>Professional</td>
<td>2</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Family Monthly income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>58</td>
<td>29</td>
<td>136</td>
</tr>
<tr>
<td>Non-sufficient</td>
<td>91</td>
<td>38</td>
<td>173</td>
</tr>
<tr>
<td>Sufficient to some extent</td>
<td>26</td>
<td>19</td>
<td>86</td>
</tr>
<tr>
<td>Previous children (less than 5 years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>7</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>1-3</td>
<td>51</td>
<td>22</td>
<td>113</td>
</tr>
<tr>
<td>4-6</td>
<td>117</td>
<td>58</td>
<td>261</td>
</tr>
</tbody>
</table>

Discussion

It was evident from this study that awareness and knowledge do not equate to practice. Inferentially, our mothers, probably, have not come to accept or understand the critical vital benefit of breast feeding or that the challenges to its practice are deemed insurmountable for now. To overcome this, emphasis should be shifted from mere dissemination of information on breast feeding to empirically helping mothers resolve potential challenges highlighted in this study.

On average only about 34% of the babies were on breast feeding and this proportion was seen to rapidly decline from about 64% at 1–2 month to around 34% at the 5–6 months. As much as this trend has been variously reported, the rate was much lower than in Port Harcourt Southern Nigeria and Sokoto in Northern Nigeria which were 58% and approximately 41% respectively at 6 months(13).

Differences in study design might have accounted for this wide variation in rates. The Port Harcourt and
Sokoto studies were both longitudinal and interventional studies and since active mobilization and monitoring have been documented to positively impact EBF practices, the reported higher rates in these locations could be attributed to these interventions(13).

Complementary breastfeeding which involves use of both breast milk, infant formula and other non-milk feeds was practiced by significantly more (39%) mothers surveyed compared to breast feeding (34%) and predominant breastfeeding (28%). Not surprisingly stratification analysis showed that mothers whose infants were older and mothers with lower education attainment practiced complementary breastfeeding than other infant feeding option.

The reason for these findings is easily explained. Most mothers usually start introducing other types of feeds as child gets older and able to tolerate these feeds in order to give them (mothers) time to attend to other activities. Likewise mothers with higher education will more likely understand and be better informed of the benefits of EBF thus delay introduction of other feeds compared to mothers with lower educational attainment. This study clearly showed that mothers with tertiary education were more likely to practice EBF compared to those with secondary and primary education. This was similar to the findings of other study done by Cheizman and his group (14).

Findings in the tables (1,2,3,) refer to relationship between mother age group, level education, Mother’s occupation, whether employed or un-employed, and income, and infant feeding patterns. receive education/counseling about infant feeding choice from mother, decision about infant feeding method was by mothers themselves, previous children was (1-3,less than 5 years), notice in household use the same infant feeding method.

This result of our research agreed with what the researcher pointed(15) which is said successful breastfeeding promotion program depends on the understanding of the factors that influence perception, Maternal socio demographic characteristic like age, education, parity, and employment may influence breastfeeding.

Other factors include, antenatal attendance, multiple births, type of delivery, previous breastfeeding experience, breastfeeding support It is the following table (3) which is refer to relationship between marriage, residence, number member in the house show no significant association with feeding pattern, these result was non consistent with the result researcher (15)

**Conclusion**

Exclusive breastfeeding practice is poor from this study but the awareness is remarkably high depicting significant knowledge-practice discordance. Factors such as low maternal education, higher socioeconomic status, non vaginal birth and use of pre lacteal feeds were significant predictors of lower EBF practice.

This study is one of the important studies related to infant and child health issues, It identified major influencing factors on infant feeding patterns and explore significance association between infant feeding patterns and mothers age, education, occupation and family income, and on other hand the study didn’t find any association between infant feeding pattern with number of household members and residence.

**Recommendations**

1. Promotion of early starting breastfeeding during the first hour of life with establishment of consultancy clinic about infant feeding problems.

2. Follow up implementation of (Ten steps) of successful breast feeding and further studies about breastfeeding practice and problems are highly indicated.

**Ethical Clearance:** Taken from the (Health Directorate of Najaf).

**Source of Funding:** It was self-funding.

**Conflict of Interest:** Nil

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The Biosynthesis of Silver Nanoparticles by *Moringa Oleifera* and its Antibacterial Activity

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**ABSTRACT**

The study was aimed to synthesized and characterization of silver Nanoparticles (AgNPs) from *Moringa oleifera* (*M. oleifera*) leaves and seeds extract, and to investigate the antibacterial activity against gram-positive (*Staph.aureus* and *Enterococcus faecalis*) and gram-negative (*Pseudomonas aeruginosa, Acinetobacter lwoffii, Shigella spp, Citrobacter spp, Alcaligenes spp, and E.coli*). The synthesized nanoparticles was characterized by UV-visible and Fourier transform infrared (FTIR) spectroscopy. The result of UV-visible reveals broadband absorption for both leaf and seed extract. The FTIR analysis showed that AgNPs contains the functional groups. The antibacterial activities against mentioned pathogens were done by using agar well diffusion method, the considerable inhibitory action for both leaf and seed extract were observed both in gram-positive and gram-negative bacterial isolates.

**Keyword:** AgNPs, Antibacterial activity, *Moringa oleifera*

**Introduction**

Bulk silver has been known for antibacterial activity since ancient times, where it used to maintain food and water fresh¹. As a result of reducing the size of bulk material to the nanoscale, the continuous energy levels are changed to discrete energy levels consequently nanomaterials may present unusual properties². Thereafter, the discrete energy levels in metal nanoparticles may develop a novel optical response due to collective oscillations of free electrons which are called surface plasmon resonance (SPR). Moreover, metal nanoparticles show remarkable shape dependent physical properties³ thus nanotechnology plays a prominent role in the evolution of many fields. Silver nano particles (AgNPs) show extraordinary response in many important applications such as drug delivery to inhibit cancer tumor growth⁴, the incorporation of AgNPs in the filter layer can deactivate *Escherichia coli* and *Enterococcus faecalis* bacteria in water treatment systems⁵, Localized surface plasmon resonance (LSPR) property can increase the enhancement of light absorption in solar cell devise about 65% for different shape nanoparticles compared to spherical AgNPs(3). AgNPs have been synthesized by several techniques such as chemical and biological reduction⁶, photo-mediated⁷, microwave⁴, laser ablation⁸ and gamma irradiation⁹. These methods have successful productions of AgNPs, but there are some undesirable synthesize steps for instance use of toxic chemicals and high fabrication cost. Green chemistry is an efficient alternative eco-friendly and cost-effective biosynthesis method of AgNPs fabrication by using plant extract¹⁰ as a reducing agent. Consequently, we describe the formation of AgNPs using aqueous extract of *M. oleifera* leaves and seeds as a reducing agent.

**Materials and Method**

Fin powder of leaf and seeds of *M. oleifera* were purchased from the commercial market. The selection of plants was based on its content of important antioxidants that act against free radicals in the human body. The plant powdered were sterilized in an autoclave at 121°C for 15 min. For the preparation of the aqueous leaf extract, 10 grams of leaf powder were mixed with 100 ml of sterile double distilled water (DDW) then boiled in a water bath at 50°C for 20 min. Using sterile filter paper (Whatman No. 1) the obtained leaf extract
was filtered into a clean conical flask then centrifuged at 6000 rpm for 20 min. The supernatant of solution samples was stored at 4°C for further studies. The same method was followed to prepare seed extract. To prepare 1mM of silver nitrate (AgNO₃) solution 16.987mg of AgNO₃ powder was added to 100ml DDW and mixed thoroughly, the solution stored in a dark bottle. For biosynthesis of Ag NPs, 90ml of 1mM AgNO₃ solution was taken in 250ml Erlenmeyer conical flask and 10ml of the aqueous extract of leaf was added to it, the solution was mixed well and incubated in a rotating shaker set at 200 rpm for overnight at room temperature in dark condition, visual observation was conducted, forming of brown to black color solution indicating the formation of Ag NPs. The same method was followed to synthesize AgNPs from seed extract. The solutions used for further characterization and antibacterial studies.

Characterization of Silver Nanoparticles

UV-VIS Spectra Analysis: The formations of AgNPs were monitored to investigate the performance of the bio-reduction of silver nitrate by leaves and seeds extract of M. oleifera plant carried out using a double beam ultraviolet-visible spectrophotometer (T92+ UV Spectrophotometer, PG INSTRUMENTS). Specimens were loaded into a 1cm path length cuvette for analysis. The UV–Vis spectrophotometric readings were recorded at a scanning speed of 2 nm intervals were scanned from 190 to 900 nm. UV–Vis analysis of two months old samples was furthermore carried out to check the immutability of AgNPs. Fourier Transforms Infrared Spectroscopy (FTIR)

Fourier transforms infrared analysis (NICOLET IR 100 FT-IR) spectrophotometer was measured for M. oleifera leaf and seed extract silver nanoparticles were dried and mixed with Potassium Bromide and pressed using hydraulic press to form pellets.

Evaluation the Antibacterial Activity of Biosynthesized AgNPs: The effectiveness of synthesized AgNPs against bacteria was investigated using agar well diffusion assay eight pathogenic bacteria, two gram-positive bacteria (Staphylococcus aureus and Enterococcus fecalis) and six gram-negative bacteria (Pseudomonas aeruginosa, Acinetobacter lwoffii, Shigella spp, Citrobactor spp, Alcaligenes spp. and E.coli) were isolated from food and different clinical specimens and identified by recommended conventional, biochemical tests and API systems. By using pour plate method, 1ml of fresh overnight culture of each isolate was placed uniformly into in the center of sterile Petri dish using a sterile pipette, then 20ml of Muller-Hinton agar was poured in each plates containing the inoculum and blended well, after the solidification, the plates were bored utilizing cork borer (6mm) to create four wells on each plate, then silver nanoparticles (20µl, 15µl, 10µl, and 5µl) aliquots were placed into each well on all plates and allowed to diffuse at room temperature for 15-20 min. The previous procedures followed by incubation of the plates at 37°C for 24 hours. The assessment of antibacterial activity was done via determining the diameter of the growth inhibition zone formed against the target bacteria. Aqueous plant extract and the aqueous solution of AgNO₃ were considered as comparative controls.

Results and Discussions

Synthesis of Silver Nanoparticles Using M. Oleifera: Primarily identification of silver nanoparticles synthesis was done by visual observation, an appearance of brown to black color in the reaction mixture denote the formation of nanoparticles. The leaf extract shows light brown color while seed extract shows yellow color before the addition of silver nitrate and these changed after 24 hours of incubation into black color indicating the completion of reaction as shown in fig 1.

![Figure 1](image-url)

**Figure 1:** (a) The aqueous extract of leaf and seed without silver nitrate, (b) The aqueous extract of leaf and seed with silver nitrate before incubation and (c) Visual observation of biosynthesis of silver nanoparticles using M.oleifera after 24 hours incubation
The formation of black color in plant extract indicates the silver nanoparticles formation. Previously it has been reported that the aqueous solution of AgNPs display a brown color as a result of the excitation of surface plasmon phenomenon\textsuperscript{11}. The color change of *Hemidesmus indicus* leaf extract from light brown to dark black was observed\textsuperscript{12}. Complete bio-reduction of Ag\textsuperscript{+} from *Aloe vera* leaf extracts happened within 24 h\textsuperscript{13}. At a reaction temperature between 60℃- 80℃ stated a rapid synthesis (within 10 min) for AgNPs by using *M. oleifera* leaf powder\textsuperscript{10}. In the presence of direct sunlight immediate reduction of Ag\textsuperscript{+} by *M. oleifera* leaf extracts occurred, while a complete reduction happened after 1h, which was indicated by the color change of the reaction solutions to dark brown\textsuperscript{14}. In the present study the complete reduction occurred after 24 h at room temperature, this appears to propose that the time desired for nanoparticle formation alter depending on the nature of reducing agent.

**UV-VIS Spectroscopy:** In the wavelength region 190-900 nm, the absorbance is enlarged as shown in fig.2. The presence of AgNPs results in a large and very broad absorbance enhancement cover the entire ultraviolet and visible spectral range moreover some parts of near IR range for both *M. oleifera* leaves and seeds extract. According to the Mie scattering theory, a broadening suggests an increase in nanoparticle size, where for particles above 30 nm Multipolar modes can emerge in the extinction spectrum due to the retardation effect as well as to the red shift in the spectrum\textsuperscript{15}. Figure 2 revealed that leaves extract produced the largest absorbance intensity between 520-830 nm compare to seed extract which is attributed to the formation of polydisperse AgNPs\textsuperscript{3}. The maximum absorption peaks of nanoparticles and nanoprisms have been reported about 400 and 600 nm, respectively, which originate from the LPRs of two various shapes of NPs. After mixing nanoparticles and nanoprisms Ag NPs, a broadband spectrum (covering the range 400-600 nm) is obtained\textsuperscript{16}. The formation of stable nanoparticles through the reduction of silver ions occurred rapidly, thus making it one of the fastest eco-friendly bio-reducing methods to produce silver nanoparticles. Moodley and his co-worker reported a maximum peak of spherical shape AgNPs at 450nm for *M.oleifera* fresh leaf extract and 440nm for *M.oleifera* freeze-dried leaf extract\textsuperscript{11}.

![Figure 2: UV–VIS spectra of AgNPs obtained using leaf and seed of *M. oleifera* extract](image)

**FTIR:** The FTIR analysis showed that Ag NPs contains the functional groups at 3538.03 cm\textsuperscript{-1} which is characteristic of hydroxyl stretching vibrations group in alcohols or phenolic compounds, 3444.81 cm\textsuperscript{-1}, 3398.79 cm\textsuperscript{-1}, 3352.68 cm\textsuperscript{-1}, 3323.06 cm\textsuperscript{-1} correspond to alkyne stretch group, 2656.53 cm\textsuperscript{-1} correspond to alkyl stretch group, 1837.48 cm\textsuperscript{-1} correspond to carbonyl stretch group for leaf extract as shown in fig. 3(a). Seed extract reveals a functional group at 3416.49 cm\textsuperscript{-1} which is characteristic of hydroxyl stretching group and 1640.34 cm\textsuperscript{-1} correspond to carbonyl stretch group as shown in fig. 3(b). These indicated that proteins and phenolic compounds were the capping and stabilization molecules in the biosynthesis of Ag NPs. Noteworthily, *M. oleifera* leaves are recognized to be an excellent source of many important nutrients including proteins, riboflavin, iron and is rich in various antioxidant phenolic compounds such as chlorogenic acid and quercetin that belong to flavonoid group which has been previously shown to have the robust chelating ability, this proposed that the reduction of Ag ions by quercetin might reduce the cytotoxic effects of silver nanoparticles(11).
Antibacterial Activity of Silver Nanoparticles: Antibacterial efficiency of silver nanoparticles against gram-positive bacteria (*Staphylococcus aureus* and *Enterococcus feacalis*) and gram-negative (*Pseudomonas aeruginosa, Acinetobacter lwoffii, Shigella spp, Citrobactor spp, Alcaligenes spp, and E.coli*) isolates performed by agar well diffusion assay and the activity was specified on the basis of the zone of inhibition. The results revealed that *M.oleifera* leaf and seed extract showed strong inhibition of gram-positive and gram-negative bacteria fig.4 and fig.5. Table1 summarizes the zone of inhibition measured, between all isolates tested the broadest inhibition zone was found to be for *Staphylococcus aureus*.

Owing to the broad-spectrum antibacterial activity of AgNPs which deduced from *M.oleifera* leaf and seed extracts AgNPs can be considered to have an effective inhibition action on both gram-positive and gram-negative bacteria. Seeing that gram-positive bacteria composed of thick peptidoglycan layer adjacent the cells plasma membrane while gram-negative bacteria contain a solid outer membrane structure which is consist of lipid bilayer and lipoproteins, this difference in the cell wall structure and membrane stability will not affect the mode of AgNPs inhibition. Many researchers investigated the antibacterial effect of biogenic silver nanoparticles solution against several pathogenic bacteria they reported different data in diameter of zone inhibition which might be because of the variation in AgNPs concentration furthermore, change in diffusion effects produced by agar medium composition.

Table 1: Zone of inhibition (mm) for Ag NPs synthesized from *M.oleifera* leaf and seed extract samples at different quantity

<table>
<thead>
<tr>
<th>Isolates</th>
<th>20µl</th>
<th>15µl</th>
<th>10µl</th>
<th>5µl</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Leaf</td>
<td>Seed</td>
<td>Leaf</td>
<td>Seed</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>23</td>
<td>15</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Enterococcus feacalis</td>
<td>15</td>
<td>11</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>18</td>
<td>14</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Acinetobacter lwoffii</td>
<td>11</td>
<td>9</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Shigella spp</td>
<td>14</td>
<td>13</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Citrobactor spp</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Alcaligenes spp</td>
<td>15</td>
<td>13</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>E.coli</td>
<td>10</td>
<td>15</td>
<td>9</td>
<td>14</td>
</tr>
</tbody>
</table>
Figure 4: *Staph.aureus* (gram+) and *E. feacalis* (gram+) exposed to Ag NPs synthesized by *M. oleifera* leaf and seed extract

Figure 5: *Pseudomonas aeruginosa* (Gram-), *Acinetobacter lwofii* (Gram-), *Shigella spp* (Gram-), *Citrobacter spp* (Gram-) and *E.coli* (Gram-) exposed to Ag NPs synthesized by *M. oleifera* leaf and seed extract

**Conclusion**

An eco-friendly and one step cost effective green synthesis of AgNPs using *M. oleifera* leaf and seed extracts as an successful reducing agent was presented in this study. The synthesized AgNPs showed considerable antimicrobial activities against gram-positive and gram-negative bacteria. This biosynthesis clean, nontoxic and eco-friendly method could be a better substitution to the conventional AgNPs synthesis method and thus it has a prospective use in biomedical applications.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

**Acknowledgments**

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References


The Outcomes of Infants with HIV Infected Mother in a Tertiary Hospital in Indonesia

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ABSTRACT

Background: Infant from HIV mother face the risk of HIV infection. Effective prevention on mother-to-child transmission (PMTCT) program increasing the number of uninfected infants in East Java Indonesia. This study describes the outcomes of infants with HIV mother in Dr. Soetomo Hospital, a tertiary referral hospital in East Java, related to outcome (infectious morbidity, nutritional status, immunodeficiency status, growth/development, and incidence of anemia).

Method: This cross-sectional study analyzed 0-18 months infant and HIV mother pairs at HIV outpatient clinic Dr. Soetomo General Hospital from January to April 2017. The data were collected and analyzed using Fisher’s exact test and chi-square test with P<0.05.

Results: Fourty HIV-infected mothers and infants pairs were analyzed, separated into two groups positive (3 infants) and negative (37 infants) Anti HIV PCR. There were 19 male. Age distribution (6 weeks-5 months 40%; 6-11 months 47.5%; 12-18 months 12.5%). Five percent were born prematurely, 77.5% infant has normal birth-weight. Only 2.5% were fed breast milk, AZT-cotrimoxazole were given to 87.5% infant while the rest received AZT/3TC/NVP. Immunizations of the infants were mostly (60%) up to date. Infectious morbidity (P=0.433), WAZ-score (P=0.666), LAZ-score (P=0.973), WLZ-score (P=0.219) and incidence of anemia (P=0.548) were not significant differences between groups. The development test using DDST II (P=0.001), as well as immunodeficiency status [presence of immunodeficiency (P<0.001)] was significantly different between groups.

Conclusion: There were significant effects of HIV exposed on the development and immunodeficiency status in 0-18 months infant.

Keywords: HIV-exposed infants, outcomes, Prevention on mother-to-child transmission/PMTCT.

Introduction

HIV infection in children has become a major problem in family, community, and health care throughout the world. Most of the causes of HIV-exposed-infected (HEI) children are a vertical transmission from mother to infant. HIV infection progression occurs very quickly in the first few months after birth. It often leads to death.¹ HIV-exposed-infected infants are infants born to mother possessing HIV positive and/or positive antibody results. HIV-exposed-uninfected (HEU) infants are infants with negative PCR DNA results.²

Vertical HIV transmission was first reported in 1983.³ It was estimated that 1.8 million children under 15 were HIV infected in 2017. About 180.000 children were newly infected with HIV, mainly through transmission of the virus from their mother during pregnancy, delivery, or breastfeeding.⁴ An estimated 110.000 children died of AIDS-related causes globally. HIV-infected infants through mother-infant transmission...
significantly increase the risk of death, in which 20% of them who do not receive therapy during the perinatal period will die within 1 year.\textsuperscript{3}

HIV related to infant mortality increases in 2-3 months of age and can only be addressed with Prevention of Mother to Child Transmission (PMTCT) by limiting the vertical transmission and providing initial therapy for HEI infants. A study in health outcomes of HEU infants has increased in the past decade. Several studies suggested that these infants have increased mortality rates, infectious morbidity, and impaired growth compared with HEU infants. However heterogeneous results might reflect the inherent challenges in the study of HEU infants.\textsuperscript{3} This research evaluates the outcome of HIV-exposed infants from infected mother in Dr. Soetomo Hospital related to infectious morbidity, nutritional status, immunological status, growth and development, as well as incidence of anemia.

Method

This research was a prospective cohort, conducted at Child Health Department, Dr. Soetomo General Hospital Surabaya within January 1\textsuperscript{st}-April 30\textsuperscript{th}, 2017. Data were taken through history-taking, physical, and supporting examination. The research subjects were all 0-18 months infant with HIV-infected mother in Dr. Soetomo General Hospital since January 1\textsuperscript{st}-April 30\textsuperscript{th}, 2017. The status of HIV infection determined by the Anti HIV PCR DNA or RNA test. The inclusion criteria are 0-18 months infant with HIV-infected mother diagnosed either before or during pregnancy, during or after the delivery and infants whose parents have agreed to participate as research sample and have signed informed consent. Parents who withdraw participation were excluded. Data collected were age, gender, nutritional status, gestational age, birth-weight, birth history, breastfeeding history, immunization status, mother’s and infant’s ARV, and infant condition (infectious morbidity, incidence of anemia, immunodeficiency status, growth and development). Infectious morbidity recorded as present if there were diarrhea, fever or cough more than three times all their life. Definition of anemia was according to WHO (Hb<13.5g/dL). Descriptive analysis were performed using Fisher’s exact test, chi-square test with significant value when P<0.05.

Results

A total of 40 infants with HIV-infected-mother were analyzed and divided into 2 groups positive (3 infants) and negative (37 infant) Anti HIV PCR DNA or RNA. No patients were excluded. Characteristics of research subjects are listed in table 1. In this study there were 3 infants infected of HIV infection, 2 infants with no PMTCT (spontaneous delivery, mother with no ARV, breastfeed) and 1 infant with PMTCT after-delivery (no ARV before and during pregnancy). Infection morbidity occurred in 18 infants were 4(10%) diarrhea infection, 14(35%) cough, 7(17.5%) fever.

| Table 1: Outcomes of HIV-infected mother born infants |

<table>
<thead>
<tr>
<th>Outcome</th>
<th>PCR (-)</th>
<th>PCR (+)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anthropometry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight for age (Z-score)</td>
<td></td>
<td></td>
<td>0.666</td>
</tr>
<tr>
<td>Median</td>
<td>31</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Severely underweight</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Length for Age (Z-score)</td>
<td></td>
<td></td>
<td>0.973</td>
</tr>
<tr>
<td>Median</td>
<td>32</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Stunted</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Severely stunted</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Weight for Length (Z-score)</td>
<td></td>
<td></td>
<td>0.219</td>
</tr>
<tr>
<td>Overweight</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>27</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Wasted</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Infection morbidity</td>
<td></td>
<td></td>
<td>0.433</td>
</tr>
<tr>
<td>Present</td>
<td>16</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Not present</td>
<td>21</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Anemic incidence</td>
<td>18</td>
<td>2</td>
<td>0.548</td>
</tr>
<tr>
<td>Immunodeficiency (CD4 %)</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No deficiency</td>
<td>29</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Developmental (DDST II)</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Suspect</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>32</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*DDST II = Denver Development Screening Test II; CD4% immunodeficiency [(< 11 months : no deficiency (;35); mild (30-35); moderate (25-30); severe(25)]; [(12-35 months : no deficiency (;30); mild (25-30); moderate (20-25); severe(<=20)].
Table 2: Infectious morbidity in HIV exposed Infants

<table>
<thead>
<tr>
<th>Infectious Morbidity</th>
<th>Number of Cases n (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIV exposed-uninfected</td>
<td>HIV exposed-infected</td>
</tr>
<tr>
<td>Fever</td>
<td>6 (15)</td>
<td>1 (2,5)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>3 (7,5)</td>
<td>1 (2,5)</td>
</tr>
<tr>
<td>Cough</td>
<td>2 (5)</td>
<td>12 (30)</td>
</tr>
</tbody>
</table>

Discussion

This research described the outcomes of 40 infants born from HIV-infected mothers, 3 infants-infected with HIV and 37 infants were not infected. Two of HEI infants with no PMTCT program and 1 infant with PMTCT program after birth. One of HIV infected infant use only 1 type of ARV, while recommendations from ARV treatment in developing country recommend giving 3 types of antiretroviral drugs, for infants who have never received ARV during pregnancy. This is in accordance with the previous research in which HEU infants population will increase.\(^5\) It is said that an effective intervention PMTCT has decreased the HIV antenatal prevalence.\(^6\)

Infectious Morbidity: In the recent study found the prevalence of infectious morbidity possesses no significant difference in both groups. This result differs from Venkatesh study of HEI infant had over twice at risk of morbidity and over four-times at risk of death compared to HEU infants.\(^9\) Mofenson in 1999 founded that maternal PVL was not only a major predictor of the risk of perinatal HIV transmission,\(^10\) but may also closely predict viral levels in maternal breast milk and the health of both HIV-infected and HIV-uninfected infants.\(^11,12,13\) The risk of hospitalization due to diarrhea and pneumonia was close to four times greater among HEI than HEU infants. The most common cause of infant pneumonia requiring hospitalization in Rufini study population exhibited PCP.\(^14\) The source of data in this study comes from recalling interviews with parents so that there is a high probability of bias recalling.

Incidence of Anemia: Anemia has been recognized as an important clinical problem in HIV-infected patients\(^15,16\) with an estimated prevalence ranging from 10% in asymptomatic HIV-infected patients to 92% in patients with AIDS.\(^17\) This study exhibited no significant difference between HEI infants compared to HEU infants. History of administration of antiretroviral drugs and cotrimoxazole in HIV exposed infants did not result in an increased incidence of anemia. The high number of anemia in this study caused by high incidence of anemia in Indonesia. The 2001 Household Health Survey showed the prevalence of ADB in infants 0-6 months, infants 6-12 months, and children under five respectively at 61.3%, 64.8% and 48.1%.\(^18\) About 66.7% anemia occurred in HEI infants in this study. Anemia could be correlated with several factors as described in several previous studies such as advanced clinical and immunological HIV disease stage\(^19,20\), breastfeeding period\(^21\), highly active antiretroviral therapy (HAART), and cotrimoxazole.\(^7\) Further research is needed to determine the cause of anemia in this group.

Growth and Development: Research results exhibited that the effects of ARV regimens may cause deficits of height and abnormality of body composition. Treatment with ARV containing protease inhibitors had a significant impact on body weight and weight to height ratio and the limit of height. This is in line with research conducted by Kerr in 2014. It stated that growth failure is a sensitive indicator of HIV disease.\(^22\) In addition, the research of potential effects of the ARV regimen category leads to a deficit in body height and abnormality of the body composition. Treatment with an ARV regimen containing protease inhibitors has a significant impact on body weight and weight-to-height ratios as well as borderline effects on height.\(^9\) However, no significant differences in growth between HIV-exposed-infected infants compared with HIV-exposed-uninfected infants in this study.

The growth failure occurs in mother with antiretrovirals. As a result of the use of nevirapine in mothers, in this study the results were not statistically significant. According to Ram (2012) studies Infants who were HIV-infected and breastfed notes were higher risk of being stunted and underweight, but not wasted, and two variables were not statistically significant. Maternal anemia has significantly increased the risk of stunting but not underweight. Infant morbidity, increased risk of underweight and wasting, but not stunting. In this study maternal education data is absent so that it cannot be assessed, while breastfeeding history, birth weight, gestational age and delivery method have no significant relationship to the incidence of stunted, underweight and wasted.
Delayed development was assessed by the Denver Developmental Screening Test and the result was a significant difference between HEI and HEU infants in this study. These results are consistent with recent findings from a trial in South Africa, in which HIV infected infants randomized to deferred ART had lower locomotors scores at 11 months of age compared with HIV-uninfected infants. Another study in South Africa found differences in language and motor scores among HIV-infected-infants who had initiated ART at a mean age of approximately 5 months. They were observed for six-months and compared with HEU infants. The study showed significant differences between the two groups. About 5 infants in HEU and 2 infants in HEI. In HEU there is a high possibility that a developmental disorder will occur so that it needs longer observation.

**Immunodeficiency:** Recent studies revealed significant differences in immunological status between two groups according to CD4%. Two-infants with HEI suffers from severe immunodeficiency and 1 infant suffers from moderate-immunodeficiency. Infants with uninfected HIV infection, 3 suffers moderate-immunodeficiency, and 5 suffers from mild-immunodeficiency.

CD4 is the parameter to measure immunodeficiency in HIV infection. It was used in conjunction with clinical criteria, therefore CD4 can be used as an early indication of disease progression because it will decrease compared to clinical condition. Infants under 18 months require assessment on two important parameters (HIV-infection and %CD4) prior to initiating HAART. Infants who are positively identified as HIV-infected and meet clinical criteria are likely to benefit from HAART. In this study accordance with the course of the HIV, in HIV-infected patients the value of CD4 is much lower than that of those infected.

**Conclusion**

In conclusion, outcome evaluation of the presence of 0-18 months HIV exposed infants have determined significant value on immunological status and growth.

**Acknowledgements**

This work was supported by the staffs of the Department of Pediatrics in Dr. Soetomo General Hospital/Airlangga University, Surabaya especially Tropic Infectious Disease division for their assistance in data collection.

**Acknowledgment**

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**Conflict of Interest:** None declared

**Ethical Clearance:** This study was approved by the Research Ethics Committee of Dr. Soetomo General Hospital.

**REFERENCES**


Relationship of Total Suspended Particulate Dust Levels, Personal Protective Equipment, and Individual Characteristics with Breathing Respiratory Complaints at Benowo Landfill Surabaya

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ABSTRACT

A landfill can have an impact on environmental quality such as air pollution from dust and gas produced from the anaerobic decomposition process, especially if waste disposal uses an open dumping system¹. The results of the preliminary study showed that scavengers in the final processing of garbage had not used PPE (Personal Protective Equipment) such as masks and did not use hand protectors. Many health complaints felt by them are low back pain and headache. This research was observational, the study design used was a cross-sectional study design. The location of the study was carried out at the Surabaya Benowo waste landfill, the sample in the study was scavengers of women who worked at the Surabaya Benowo waste landfill aged 15-64 years. The method of measuring TSP (Total Suspended Particulate) dust using laboratory tests with gravimetric methods, data on the use of PPE mask and respiratory complaints were obtained through questionnaires. Statistical tests were used to see strong relationships using Kendall’s tau-b with a significance value of α = 0.05. The results of the air quality test in the form of TSP dust content at the work site of the scavengers showed the results of 0.0972 mg/Nm³ which meant that TSP dust levels did not exceed environmental quality standards. Of the 37 scavenger respondents, 13 people (24%) experienced moderate respiratory complaints and 24 people (65%) experienced mild respiratory complaints. Characteristics of individual scavengers associated with respiratory complaints were cigarette exposure (Sig = 0.025) and disease history (Sig = 0.00). There was no significant relationship between the use of PPE with respiratory complaints suffered by scavengers at Benowo landfill Surabaya.

Keywords: TSP Dust, Respiratory Complaints, Individual Characteristics.

Introduction

The landfill is a place where waste reaches the last stage in its management from the start in the source, collection, transfer or transportation, processing to disposal.

Open dumping landfill will be a source of income for local residents, especially for people who do not have jobs and choose to become scavengers at the final processing of garbage.

The landfill can have an impact on environmental quality and scavenger such as air pollution from dust and gas produced from the anaerobic decomposition process, especially if waste disposal uses an open dumping system¹.

Air pollution is pollution inside and outside the room either by chemical agents, physics, or biology that changes the natural characteristics of an environment².
The results of a preliminary study conducted on December 23, 2015, showed that scavengers at Benowo landfill Surabaya did not use PPE such as masks and hand protectors. Many health complaints felt by them are back pain and headache. Low back pain and fatigue occur because their work is not ergonomic, such as constantly looking down to pick up garbage long time, and dizziness can be caused by sun exposure from morning to evening when they work.

**Material and Method**

Judging from the data collection method, this research is observational. The study design used in this study was a cross-sectional study design.

The location of the study was carried out at Benowo landfill Surabaya, precisely at the South IIB waste point. The sample in the study was scavengers of women who worked at Benowo landfill Surabaya 15-64 years old. The determine sample to be carried out during this research is by using Simple Random Sampling.

The variables in this study consist of independent variables and dependent variables. The independent variable in this study is TSP (Total Suspended Particulate) Dust, while the dependent variable is respiratory complaints.

How to measure the independent variables and dependent variables in this study include TSP Dust Based on East Java Governor Regulation No. 10 of 2009 using laboratory tests with Gravimetric, PPE (Self-Protective) mask methods through questionnaires and respiratory complaints through questionnaires. Statistical tests using Kendall’s tau-b with a significance value of $\alpha = 0.05$.

**Findings**

Benowo Surabaya landfill is located on Jl. Romokalisari Romokalisari Village, District Benowo Surabaya. has an area of 38.7 hectares, 24 of which are used for sanitary landfills consisting of 5 terminals and the rest are used for public facilities, there are green beams which are used as odor catchers around the landfill site and along to the terminal.

Every month there are only 2 terminals that are used for loading and unloading garbage, 3 are carried out by fireplaces and backfillers use the land. Garbage that is in Benowo landfill comes from all over the Surabaya area, the volume of waste that comes in a landfill is around 1,200 tons/day.

The results of the measurement of ambient air quality at Benowo Surabaya landfill show that the dust parameters are 0.0972 mg/Nm³ where the results are still below the quality standards set by Rule. Gub. East Java No. 10 the year 2009. Coarse dust particles can be filtered by a hair in the nostrils, while fine dust particles will become entangled in the mucus layer. In addition, high levels of TSP dust can endanger health because it can cause obstruction and restriction from the airways.

Respiratory complaints in this study diseases that have been or are being experienced by scavengers during the last three months, including coughing, phlegm, wheezing, shortness of breath, flu and chest pain.

Mild respiratory complaints in this study included mild coughing less than 4-6 times a day, flu for <3 weeks, and coughing up phlegm <3 months. While moderate respiratory complaints in this study include mild coughing up to 4-6 times a day, wheezing or wheezing, experiencing shortness of breath so difficult to walk, flu>3 weeks, coughing with phlegm for>3 months and chest pain.

**Table 1: Scavengers Mild And Moderate Respiratory Complain**

<table>
<thead>
<tr>
<th>Respiratory Complaints</th>
<th>Total</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightweight</td>
<td>24</td>
<td>65</td>
</tr>
<tr>
<td>Medium</td>
<td>13</td>
<td>35</td>
</tr>
<tr>
<td>Weight</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>100</td>
</tr>
</tbody>
</table>

From the table above it can be seen that scavengers who experienced mild respiratory complaints were 24 people (65%), while scavengers with moderate respiratory complaints were 13 people (35%).

Coughing is the most common symptom of respiratory problems. Stimulations that usually cause coughing are mechanical and chemical stimulation, dust inhalation, smoke, and small foreign objects are the most common causes of coughing.

The relationship of scavenger characteristics in the form of using PPE with respiratory complaints in this study showed that scavengers, using PPE experienced mild respiratory complaints of 13 people (65%) and severe respiratory complaints of 7 people (35%). Whereas with scavengers who did not use PPE...
experienced respiratory complaints as many as 11 people (65%) and experienced moderate respiratory complaints as many as 6 people (35%). The results of statistical tests obtained Sig=0.985, it can be interpreted that there is no relationship between the use of PPE with complaints of respiratory scavengers landfill Benowo Surabaya.

This is because the masks used by scavengers are masks that are specifically not intended to prevent exposure to harmful gases or dust, scavengers only use ordinary cloth or their veils for women to use to cover their noses, this is not the same as having no effect on exposure to incoming gas in the respiratory tract.

### Table 2: Age Of Cavengers Mild And Moderate Respiratory Complain

<table>
<thead>
<tr>
<th>Age (th)</th>
<th>Mild</th>
<th>Medium</th>
<th>Total</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24th</td>
<td>2</td>
<td>33</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>25-34th</td>
<td>9</td>
<td>75</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>35-44th</td>
<td>9</td>
<td>69</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>45-54th</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>55-64th</td>
<td>1</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

From the table, it can be seen that the scavengers mild respiratory complaints are the highest in the 25-34 age group of (75%). Whereas the biggest scavengers who experience moderate respiratory complaints are in the age group 15-24 by 67%.

Jatibarang landfill in Semarang, the results showed that complaints of health problems were more experienced by 43.3% female scavengers aged less than 39 years (young age) compared to aged female scavengers ≥ 39 years old (old age).

Based on the results of the research, the results of statistical tests using Kendall’s tau-b obtained Sig = 0.000 so that it can be interpreted that there is a relationship between the history of the disease

<table>
<thead>
<tr>
<th>Working Time</th>
<th>Respiratory complaints</th>
<th>Total</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Medium</td>
<td>n</td>
</tr>
<tr>
<td>≤5 tahun</td>
<td>9</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>&gt;5 tahun</td>
<td>15</td>
<td>68</td>
<td>7</td>
</tr>
</tbody>
</table>

Most scavengers who experience mild breathing complaints are > 8 hours of exposure, which is 21 people (68%), while most scavengers with moderate respiratory complaints at exposure to ≤ 8 hours are 50%.

The longer a person’s exposure is likely the greater the risk of lung disease. This shows that the longer a person’s work will be the longer the time for exposure to the pollutant occurs.

Based on the questionnaire results related to individual characteristics that have been distributed to scavengers, it was found that was a significant relationship between exposure to cigarettes and respiratory complaints with a Sig value=0.025. From the results of the study, it can also be seen that 100% of active smokers experience moderate respiratory complaints and 40% of passive smokers experience moderate breathing complaints and 60% of passive smokers experience mild breathing complaints.

This is consistent with the research that cigarette exposure is a protective factor for pulmonary dysfunction in employees. Besides that, there is a significant relationship between smoking habits and respiratory disorders.

Based on the results of the research, the results of statistical tests using Kendall’s tau-b obtained Sig = 0.000 so that it can be interpreted that there is a relationship between the history of the disease.
and complaints of scavenger breathing at Benowo Surabaya landfill. In addition, the results of the study also showed that scavengers with a history of 71% had moderate respiratory complaints and 29% of scavengers experienced mild respiratory complaints.

The results of this study are in line with the research conducted that workers who have had lung disease are significantly associated with lung function disorders7. Likewise with research workers who have a history of pulmonary disease will find it easier to get pulmonary function disorders compared to workers who do not have a history of pulmonary disease8.

Conclusion

1. The results of testing the air quality in the form of TSP dust content at the work site of waste collectors showed the results of 0.0972 mg/Nm3 that TSP Dust levels did not exceed environmental quality standards according to the East Java Governor Regulation No. 10 of 20099.

2. Of the 37 scavenger respondents, 13 people (24%) experienced moderate respiratory complaints and 24 people (65%) experienced mild respiratory complaints.

3. Characteristics of scavenger individuals associated with scavenger lung physiological disorders, namely cigarette exposure (Sig=0.030) and disease history (Sig=0.00). While the characteristics of individual scavengers associated with respiratory complaints were cigarette exposure (Sig=0.025) and disease history (Sig=0.00).

4. There was no significant relationship between the use of PPE (Personal Protective Equipment) with respiratory complaints suffered by scavengers in the garbage dump in Benowo Surabaya.

Conflicts of Interest: All authors have no conflicts of interest to declare

Source of Funding: The source of this research costs from self.

Ethical Clearance: The study was approved by Health Research Ethics Committee Faculty of Public Health Airlangga University No: 154-KEPK

All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

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Determinants of Breast Cancer in Eastern North Baghdad

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ABSTRACT

Background: Breast cancer is the most common cancer affecting women all over the world. Breast cancer is the most frequent cancer among women in Iraq, it is account for approximately one third of the registered female cancers in Iraq. The age adjusted rate of breast cancer is 31.5 per 100000. Young women are at relatively higher risk for developing breast cancer than that in Western countries.

Method: A total of 300 case records of attendees to the early detection clinic of breast cancer in Al-Imamain al Kadhimaein Medical City. The sample was selected in systematic random sampling.

Results: Out of the total, 101(33.7%) were with malignant tumor. Age of menarche 12 ± 1 year was significantly earlier in malignant cases p<0.05. Breast cancer was significantly increased with age p=0.00. breast ca was significantly varied between marital status p=0.04. positive history of contraceptive use was significantly associated with breast cancer p=0.001. positive family history, positive lactating history and positive smoking history were not significantly associated with breast cancer p> 0.05.

Conclusions: Early onset of ca breast in Iraq. There is an urgent need for screening program.

Keywords: Breast cancer, Determinants, Baghdad, Iraq, risk factors.

Background

Breast cancer is the number one cancer in women across the world. It makes up 16% of all female cancers and accounts for 16% of cancer deaths globally.

Breast cancer is the most frequent cancer among women in Iraq, it is account for approximately one third of the registered female cancers in Iraq. The age adjusted rate of breast cancer is 31.5 per 100000. Young women are at relatively higher risk for developing breast cancer than that in Western counterparts.

Geographical variations in incidence and mortality rates of breast cancer suggest that the known risk factors for breast cancer may vary in different parts of the world and environmental factors are of greater importance than genetic factors.

The population, cultures, religious, habits, and knowledge of women in eastern Mediterranean region (EMR) is different from the women lived in developed countries. Majority of women in this region knows little about screening methods of breast cancer. Differences in cultures, habits, and ethnicity. Differences in marital age, pregnancy features, age of menarche, and other important variations in risk factors of breast cancer in this region. In many countries such as Iran, Tunisia, Pakistan of this region the breast cancer diagnosis age is younger than other parts of the world.

Although more than half of all new cases of breast cancer in the world were diagnosed in the industrialized countries (i.e. North America excluding Mexico and Western Europe), more than three quarters of breast cancer related deaths occur in the developing countries. This discordance in incidence and survival is largely related to the lack of organized mammographic screening.

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in developing countries, the advanced stage at diagnosis (>60% of patients are diagnosed with stage III/IV breast cancer in the developing countries), poor access to care, and substandard treatment regimens\(^7\)\(^-\)\(^9\).

The known most important determinant factors for breast cancer included: age, family history, genetics, personal history of breast cancer, radiation to chest/face before age 30, race/ethnicity, being overweight, pregnancy/breast feeding and menstrual history, using hormone replacement therapy (HRT), drinking alcohol, having dense breast, lack of exercise, and smoking\(^10\),\(^11\).

Identification of risk factors of breast cancer is essential for policy makers to plan preventive strategies.

**Objectives**

The goal of this study to identify the determinants of breast cancer in Iraq for future applying in screening program.

**Material and Method**

A total of 300 case records of attendees to the early detection clinic of breast cancer in Al-Imamain al Kadhimaein Medical City. The sample was selected in systematic random sampling. The required information was demographic data, age at menarche, family history of breast cancer, use of contraception, history of smoking, history of lactation and type of tumor (benign or malignant).

Chi square test was carried out to examine the association of studied factors on the malignancy. \(p\leq\)0.05 was considered significant.

Student’s \(t\) test was done to examine the difference in means of age and age of menarche.

**Results**

Out of the total, 101(33.7%) were with malignant tumor. In 271(90%) the mass was self-detected and 22(7.3%) were detected in clinical breast examinations.

In malignant cases the age at menarche was 12±1 year and in benign cases was 13±1 year. The age of menarche was significant lower in malignant cases than that in benign cases (\(t=4.6, df=298, p=0.000\)).

The age of women with malignant cases was 5(15%) in the 2nd decades, 21(24.7%), 34(31.5%), 30(58.8%) and 11(73.3%) in the 3rd, 4th, 5th, 6th, and 7th decades respectively. It was shown that the breast cancer increased with age (\(\chi^2 = 36.2, df=4, p=0.000\)).

Breast cancer was noticed in 10(23.3%), 74(33.2%) and 17(50.0%) in the unmarried, married, and divorced, widow & separated, respectively. The breast cancer was significantly varied between the marital status (\(\chi^2= 6.17, df=2, p=0.04\)).

A mass was the main presenting symptoms in 73(54.1%), pain in 12(18.5%) and mass with pain in 13(15.3%). Mass was significantly the dominant presenting symptoms (\(\chi^2= 51.5, df=6, p=0.000\)).

Positive family history was noticed in 25(35.7%) of women with breast cancer. The positive family history was not significant associated with breast cancer (\(\chi^2=0.17, df=1, p=0.6\)).

Positive history of contraceptive use was observed in 39(48.8%). It was significantly associated with breast cancer (\(\chi^2=11.1, df=1, p=0.001\)).

Sixty seven (33%) of women with breast cancer gave a history of lactation. It was not significant associated with breast cancer (\(\chi^2=0.12, df=1, p=0.7\)).

Positive smoking history was noticed in 9(52.9%) of breast cancer. No significant association between breast cancer and smoking (\(\chi^2=2.99, df=1, p=0.08\)).

**Table 1: Age of menarche in benign and malignant cases:**

<table>
<thead>
<tr>
<th>variable</th>
<th>Age of menarche</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>X ± SD</td>
</tr>
<tr>
<td>Benign</td>
<td>199</td>
<td>13 ± 1</td>
</tr>
<tr>
<td>Malignant</td>
<td>101</td>
<td>12 ± 1</td>
</tr>
</tbody>
</table>

**Discussion**

This study revealed that 90% of cases detected the mass by self-examination. In the absence of developed screening program for breast ca in health service, Iraq depends on breast self-examination as a screening method. In the last 2 decades, early detection centers were developed. Deterioration of health system in Iraq due to wars and widespread violence lead to neglecting screening program for breast ca.

The clinical breast examination revealed a mass in breast in 7.3%. A finding reflects a failure of health...
A mass in breast was a presenting symptom in 45% of patients (benign and malignant). This finding reflects the activity of Ministry of Health to create the early detection clinics.

The age of women with malignant tumor was 48 ± 10.7 years. It is almost similar to that reported in Iraq, Saudi Arabia (47-48.6) year and Iran (43.4-49.3) year. The observed figure (48 ± 10.7 year) is lower than that reported in Australia, Denmark, Sweden and UK 62.5 years range (60.6-63.9) years. The difference might be explained by the difference in life expectancy.

The highest frequency 33.7% of malignant cases were at age group (41-50). The observed figure is similar to that in other studies in Iraq and that in the region (Bahrain and Oman). It is higher than those reported in USA and France. This difference might be attributed to the higher proportion of women aged < 50 years old in Iraq and generally in developing countries. The proportion of women < 50 years old in Iraq has 82%. It might be due to genetic, contraception use, westernization lifestyle including late marriage, late age at first birth, less number of pregnancies, less breast feeding duration and westernization of diet.

The mean age of menarche in malignant cases were 12 ± 1 year. It is significantly earlier than that in benign cases 13 ± 1 year. Early menarche ≤13 are well documented as a risk factor of breast cancer.

High frequency of malignant cases with positive family history of breast cancer (35.7%) is similar to that documented in Iraq. Low frequency of positive family history in Japan and Nigeria. It might be explained by the fact customary consanguineous marriages. This phenomenon may be due to tribal factors in Iraq.

Age of malignant cases with positive family history (46 ± 10 year) was lower than that of malignant cases with negative family history (48.6 ± 11 year). Similarly it was reported in Morocco.

Contraception was significantly associated with cancer breast (p=0.001). Similar finding was reported in Iraq. Contraception users constitute 48.8% from those with breast cancer. This proportion is higher than that in Iran and lower than this study in Bangkok. This difference might be explained by memory biased. Several brands with different concentrations are available in the Iraqi market might be interfered with this finding.

Smoking and breast cancer were not significantly associated. Inconsistent with that in literature. This finding might be explained by the fact that smoking is a stigma to female, so that they hide that in history taking.

The proportion of breast cancer was high among widow, divorced and separated than that among married and unmarried (p=0.04) similar finding was reported in Iraq.

Breastfeeding is of particular interest as a modifiable risk factor for breast cancer. No significant association of negative lactation history with breast cancer was observed (p=0.7). It is in contrast with that in this meta-analysis. This finding might be explained by the insufficient information in the case records. This lack of information explained by deterioration of health system in Iraq.

Conclusion

Early onset of breast cancer in Iraq. There is an urgent need for screening program of breast cancer. To establish guideline for screening of breast cancer.

Ethical Clearance: Taken from the Arabic Board of Health specialization.

Source of Funding: Self-funded.

Conflict of Interest: No conflict of interest

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22. United Nation, Department of Economic and Social Affairs, Population Division, Population Estimates and Projections Section.


Influence the Awarding of a Purple Sweet Potato Snack (Ipomoea Batatas Poiret) and Flour Anchovies (Stolephorus) in Toddlers Stunting in The Region of Clinics Paccerakang Makassar

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1Department of Nutrition, Makassar of Health Polytechnic, Indonesia; 2Mamuju of Health Polytechnic, Indonesia

ABSTRACT

An increase in the incidence of disease caused by stunting along with the occurrence of degenerative diseases. Directly caused less intake of less and the presence of infectious diseases. Indirectly, such as the environment, social cultural and economic. One of the alternative treatment with primary food intake increases and the granting of a snack. This research aims to know the influence of awarding the purple sweet potato and snack flour anchovies on childhood stunting. Quasi experimental design research approach pre test post test with the control. Samples taken toddlers suffering from stunting. The location was done in Makassar and Mamuju. Snack made from purple sweet potato and flour anchovy designed with value energy 160 calories and protein 3.5 to 5 grams its serving a day given once. The results obtained occurs gaining weight and height on both treatment and control means both before and after the intervention. But if the comparison group treatment and control are not meaningful. Nutritional status before treatment index TB/U short and very short 26 (86%) on the Group’s treatment and 26 (86%) on the group control and after treatment in the treatment group 26 (86%) and group control 15 (50%). Index BB/TB before treatment thin and very thin on treatment group 4 (13.3%) and on the group control 11 (36.6%) after treatment group treatment 26 (86%) and group control 22 (73%). Conclusion change of nutritional status improved in smaller treatment group. An increase in weight and height but have not yet reached the standard. Suggestion allotment of purple sweet potato and snack flour anchovy can proceed given to toddlers.

Keywords: snack, purple sweet potato, flour anchovy, toddler stunting.

Introduction

Less nutritional problems and malnutrition to date this has not been resolved completely. The results of the monitoring of the nutritional status of infants (0-59 months) years 2016 nationally with the index BB/U the malnutrition 3.4% and 14.4% less nutrition1,2,6. According to index TB/U children extremely short 7.5% and 19.1% short. While according to index BB/TB and the very thin 7.5% and the skinny3,4,5. Picture in South Sulawesi as follows based on the index BB/U children suffer malnutrition 4.4% and 16.5% less nutrition. For index TB/U children extremely short 7.5% and 19.1% short3,8,15. According to index BB/TB and the very thin 7.5% and the skinny8,10,14.

The cause of the problem of malnutrition is a factor. Factor in the risk of children suffering from nutritional problems is less intake, presence of infectious diseases such as ISPA, measles, diarrhoea, intestinal worms. Other factors such as the environment (means, clean water), social culture and economy. Short term relief is correct the child’s diet and intake, cure a variety of ailments suffered companion infection or disease. For the long term is to improve income levels (economic) family12,13,17.
The impact of this nutritional problem in the long term would interfere with growth and development and child health. This will cover the impact of cognitive and skills to work. This will result in the generation of low-quality, not being able to compete globally\textsuperscript{18}. One of the programs the Government in solving the main nutritional problems prevent a high number of stunting is additional feeding. Food additives can be a snack such as a purple sweet potato and snack flour anchovy.

Anchovy is a local food with a variety of advantages, can be consumed fresh or processed into flour. Benefits for the growth and development of brain function in children as well as the health as prevention of heart disease. This is supported by the high protein content, fatty acid omega three levels as well as vitamins and minerals\textsuperscript{7}.

Purple sweet potato is a local food with a variety of advantages and beneficial to health. High fiber, low carb, rich in antioxidants and vitamins and minerals. The disadvantage is its low protein content\textsuperscript{18,19}. To make the purple sweet potato processed can be enhanced with the addition of flour protein value of anchovy. New food produced like a snack have a better nutritional value and can be consumed by people including children are toddlers.

Still high toddlers suffering from stunting his food intake needs to be increased. One of the ways that can be done is by the giving of snack made from purple sweet potato ingredients flour and anchovy\textsuperscript{19}. Awarding of purple sweet potato and snack flour anchovy is expected to be beneficial in increasing weight and height child stunting. The purpose of the study is to know the influence of awarding the purple sweet potato and snack flour anchovy against stunting toddler nutrition status.

### Material and Method

The research method used was quasi experiment pretest and posttest control group. Before given a snack both groups rated the status of its nutrition value. Next to the Group’s treatment was given a snack for one month (30 days) while the control group not given the treatment. After the intervention of two groups finished re-assessed the status of its nutrition value\textsuperscript{10,15}. The results were analyzed in descriptive and statistical test using paired T-test.

The population is all of the toddlers who experience stunting work area clinics Paccerak kang in Makassar and the toddler in the working area clinics Kaluku Mamuju.

Sample treatment is a toddler who suffered stunting a work area clinics Paccerak kang selected random simple. Sample control is a toddler who suffered in the region a stunting clinics Kaluku Mamuju. The respondent was the mother of a toddler sample. Great sample treatment and control groups each of 30 children. Sample criteria is age 11-60 years and healthy time of data collection. The measured variable is the status of child nutrition toddler and children’s food intake. Data on nutritional status in Anthropometry with index BB/U, TB/U and BB/TB. Measured parameters gender, age, weight and height. Book Anthropometry used WHO antro 2005. Food intake was measured by the method of the 24-hour food recall when, then analyzed the value of its nutrition value using DKBM. Analysis of the research done on variable descriptive statistics and analysis. To know of any changes before and after intervention with the test paired T-test

### Findings

Formulation of draft refers to the proportion of the nutritional value of snacks in the amount of 10% of the adequacy of energy and protein. The adequacy of the energy group 6-59 months of 1125-1600 kcal protein and 26-35 grams everyday. Therefore this snack designed 10% of adequacy of energy and protein so energy made 16 kcal and 3.5 to 5 grams of protein its portion is big and it is hoped children could spend. Snack purple sweet potato and anchovy flour that is made is:

1. Cake/bolu purple sweet potato and flour anchovies (163.8 energy kcal, protein 3.3 g/porsi)
2. The purple sweet potato Croquette mix and flour anchovy (161.8 6.0 energy grams protein and/porsi)
3. The purple sweet potato mud cake and flour anchovies (166.5 kcal of energy and protein 4.2 grams)
4. The purple sweet potato and Nugget flour anchovies (163.7 Kcal energy and protein 7.0 g/porsi)
5. The ball is the ball of purple sweet potato and flour taste salty anchovy (159.4 energy and protein 7.5 g)
6. The ball is the ball of purple sweet potato and flour anchovies (sweet) (163.0 energy and protein 7.5 g/porsi)
7. Prol the purple sweet potato and flour anchovies (153.1 Kcal of energy and protein 4.8 g/porsi)
8. Tarajong (156.0 kcal of energy and protein 3.6 g/porsi)
9. Talam Cake the purple sweet potato and flour anchovies (153.2 kcal of energy and protein 3.2 g/porsi).

**Research Variables**

**Changes in body weight, height, the intake of energy and protein:** Very stable weight influenced daily food intake and the conditions of measurement. When the officer less when weighing more can occur due to an attribute that is used the child forget the minimized state of the tool and weigh whether new or already measure or not for a long time. Children’s health conditions such as diarrhea, heat or fevers, vomiting cough long will have an impact on the child less appetite and cause weight loss.

The increase in weight occurred in both groups, the Group of treatment going on average increased weight of 0.5833 kg while in control group of 0.1300 kg. The larger increase in the Group’s treatment.

Height is more stable and the parameters that describe what happened in the past. Height children can’t go down. If the current high less than his normal reflects his past is indeed short at the time were born or mother suffering from malnutrition when she was pregnant. After birth the baby is not getting enough nutrient intake to catch up growth in the womb\textsuperscript{12,14,17}.

Child nutrition intake method using 24-hour food recall describing what is consumed over the past 24 hours ago are starting to wake up until the night before going to bed. Recall when at the beginning of the study and research on the end just gave an overview of the time and not give an actual description of what is consumed during one month. If linked with other parameters such as gaining weight then this intake has been giving the effect of a particular time subs. These changes can be seen in diagrams 1 to 4.

**Table 1: Distribution of average variable weight, height, and energy intake protein treatment and control group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Before</th>
<th>After</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>Treatment</td>
<td>8.64</td>
<td>9.5</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>9.78</td>
<td>9.91</td>
<td>0.066</td>
</tr>
<tr>
<td>Height</td>
<td>Treatment</td>
<td>78.89</td>
<td>79.08</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>82.00</td>
<td>82.04</td>
<td>0.009</td>
</tr>
<tr>
<td>Energy intake</td>
<td>Treatment</td>
<td>471.6</td>
<td>801.1</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>837.8</td>
<td>969.4</td>
<td>0.000</td>
</tr>
<tr>
<td>Protein intake</td>
<td>Treatment</td>
<td>21.7</td>
<td>28.9</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>23.7</td>
<td>27.7</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: Primary data 2018

**Table 2: Distribution of nutritional status according to index BB/U groups before and after intervention**

<table>
<thead>
<tr>
<th>BB/U</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Very less</td>
<td>16</td>
<td>53.3</td>
</tr>
<tr>
<td>Less</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary data 2018

**Table 3: Distribution of nutritional status according to height index (TB/U) before and after treatment**

<table>
<thead>
<tr>
<th>TB/U</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Very short</td>
<td>14</td>
<td>46.6</td>
</tr>
<tr>
<td>Short</td>
<td>16</td>
<td>53.4</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary data 2018
Table 4: Distribution of nutritional status according to the index weight according to height (BB/TB) before and after treatment

<table>
<thead>
<tr>
<th>BB/TB</th>
<th>Before Treatment</th>
<th>Control</th>
<th>After Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Very skinny</td>
<td>3</td>
<td>3,3</td>
<td>2</td>
<td>6,6</td>
</tr>
<tr>
<td>Thin</td>
<td>14</td>
<td>46,6</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Normal</td>
<td>13</td>
<td>43,4</td>
<td>16</td>
<td>53,4</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary data 2018

Discussion

Nutritional status is a reflection of the intake of nutrients and the body’s ability to use and exploit it are reflected in body size and proportions of the body. Parameter commonly used height, weight against age, the proportion of weight against height and other nutritional status according to the distribution of the index weight according to age (BB/U), height according to age (TB/U) and weight according to height Agency (BB/TB).

Nutritional status with weight loss index according to age (BB/U) gives an overview of the current state. In table 3 above seen less status and very less dominating group treatment and control group before the intervention. There is an increasing change after intervention of nutritional status is very less is becoming less good nutritional status on treatment group or the control group. This condition can be affected by intake and State of health of the child. The passive consumer is a toddler treatment where the intake is still very dependent on the mother or his running mate. On the other hand if the mother thinks her son can already self-sufficient so that it becomes less attention plus the children getting to know food courts. The consumption of snacks such as crackers, assorted biscuits and milk packaging is often given after the midmorning meal at lunch time and would not eat or given drink milk 2 cups of morning, noon and night. This can affect children’s food intake. Weight loss is a labile parameters are easy to change. This time the intervention assumption is only 30 days and at the time of research there were child illness (fever, flu and cough). It is like declaring the results of the research there is 2016 Siska relationship knowledge of pregnant women and the intake of nutrients with a baby born short in Karanganyar Regency and Ernawati 2013 also stated there is the influence of protein intake of pregnant women and the length of the body. In this study the increase relative height is small and this state of Affairs indicates that at this age children are indeed slow than the age of the baby.

Nutritional status with the index BB/TB provides an overview of the current state and past. On the Group’s treatment before the intervention there are 13 (43.44%) normal children and 14 (46.6%) children are thin and very thin 3 (3.3% 0 changed after the intervention of a normal kid into 16 (53.4%), skinny kid that 12 children (40%) the family and the very thin 2 children (6.6%), on the group control and the very thin 1 children (3.3%) a child has not changed, the skinny 6 children (20%) unchanged and the normal of the 23 children (76.7%) do not change. The increase of the very thin on the Group’s treatment caused the end of intervention child illness (fever, cough, flu). The same thing also happened in the control group that is a sick child but did not decrease the weight of the child. This situation can be seen in table 4.

Stunting has not yet reached normal levels. The granting of this snack can proceed as a healthy snack of the child and the family.

Conclusion

The conclusion of the Formula of purple sweet potato snack and anchovy flour to increase the intake of energy and protein toddler stunting. It has been created
by as much as 9 items snack for toddlers stunting but have yet to achieve adequacy nutritional stunting toddler. An increase in weight and height but not yet reached normal nutritional status.

Conflict of Interest: Conflicts of interest between researchers and subjects did not occur in this study.

Source of Funding: This study received superior funding from the Makassar of Health Polytechnic at 2018.

Ethical Clearance: The research ethics was obtained based on recommendations from the ethics commission of the Makassar Health Polytechnic with numbers 469/KEPK-PTKMKS/VII/2018.

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Real Time PCR Detection, Sequencing, and Phylogenetic Tree Analysis of Newcastle Diseases Virus Isolated from an Outbreak in Layer Flocks in Baghdad Capital, Iraq

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ABSTRACT

The definition of the Newcastle disease (ND) under the World Organization for Animal Health strategy is that chicken which infected with ND virulent (NDV) strains of avian paramyxovirus (APM). The current work included the identification of pathogenic properties (PPs) of serotype 1 belongs to AP that was detected in samples collected from severe-ND-affected chickens. The detection was performed measuring heamaglutination inhibition (HI), intracerebral pathogenicity index (ICPI), and mean death time (MDT) for in vivo exploration and real time-quantitative polymerase chain reaction (RT-qPCR), restriction enzyme analysis (REA), and DNA sequencing of the F2/F1 cleavage site for the in vitro investigation. This study is the first genetic-based analysis of the ND virus in Iraq. Complete correlation between the in vivo and in vitro results was recognized. The findings of the in vivo investigation showed that the strain was pathogenic and at the same time the structural patterns of the restriction plus the sequence of the amino acids were typical for virulent strain which resemble with 99% Iranian strain.

This study adds new information about the pathology and antigen distribution of this novel virus in Iraq and additional work is needed to get a complete data base of viral diversity and procedure for vaccinating and eliminating from this disease in our country.

Keywords: New Castle Disease, phylogeny, RT-qPCR, sequencing

Introduction

Newcastle disease can induce serious production losses in poultry industries for the occurrence of mortalities in high rates1,2. The etiological factor responsible of causing the ND is a virulent strain, APMV-1. The virus is categorized under the Paramyxoviridae family, the Mononegavirales order, and the Avulavirus genus. The disease is widespread in Iraq encouraging for continuous surveillance regarding identifying newly emerged strains of the ND virus. For the viral structure, the genome is presented in a single-stranded RNA that shows six-modular-protein-coding genes, 30-NP-P-M-F-HN-L 5'. Moreover, the ribonucleoprotein complex of the virus is made from a nucleoprotein, a phosphoprotein, and a large protein. The complex play important roles in replication of the genome plus expression of mRNA4. Intracerebral pathogenicity index (ICPI) can categorize the APMV-1 into certain pathotypes classifying the viruses into genotypes that can be further explored using the phylogenetic analysis. Using the ICPI, APMV-1 can be sorted into three pathotype strains: lentogenic, mesogenic, and velogenic. Using the metric provided by the (OIE), An ICPI of 0.7 indicates lentogenic typed strains, an ICPI range of (0.7-1.5) suggests mesogenic
An outbreak
All layers have pathological samples and tissue homogenates and stored allantoic fluid were collected, clinical and pathological samples, and then the collected and stored allantoic fluid were collected, clinical and pathological samples and tissue homogenates when flock suffered from signs of Newcastle Disease and the mortality rate reached 78% for about 10 days with the following symptoms:

The isolating of the NDV: Isolation was done in embryos of chicken eggs aged 9-11 days which inoculated with clinical and pathological samples, and then the collected and stored allantoic fluid were collected, clinical and pathological samples and tissue homogenates.

Materials and Method

Poultry Farms and Classical Tests: An outbreak occurred during March 2018, in Baghdad, Capital of Iraq. The farm composed from five caged houses 18 week layers with total number of 100,000 hens. The symptoms recorded were signs of respiratory involvement showing gasping, different degrees of coughing, rales, pronounced nasal discharge with dyspnea, recumbency, head tremors, decreased awareness, blood-stained diarrhea, head and throat-based swollen, and conjunctivitis. According to the presence of those signs, ND was immediately suspected, so that swabs of oropharyngeal and cloacal contents were collected from infected live and dead birds.

The isolating of the NDV: Isolation was done in embryos of chicken eggs aged 9-11 days which inoculated with clinical and pathological samples, and then the collected and stored allantoic fluid were collected, clinical and pathological samples and tissue homogenates on as micro-plate well as slide haemagglutination (HA) test with 0.1% and cRBC suspension that was prepared as described by\textsuperscript{11}. NDV identification applied haemagglutination inhibition (HI) test by employing HA positive samples with NDV hyperimmune sera elevated in chickens. Assessment of pathogenicity by ten samples were confirmed NDV out of 30. The pathogenicity was measured on basis of the highest mortality. In vivo depend on MDT in chicken embryos and the ICPI in day-old chicks. The MDT and ICPI tests were induced using a standard procedure revealed by\textsuperscript{12}.

Serological Diagnosis: Sixty swabs were used for serological diagnosis of ND virus antigen using Lilitest (Lillidale Diagnostics, England) Rapid ND Ag Test Kit to qualitatively detect of avian-secretion-based ND viral antigen (NDV Ag).

RNA Extraction: All samples were pooled on FTA spots (Whatman\textsuperscript{®} FTA\textsuperscript{®} card technology), each card contains four areas of samples, up to 100μl of homogenized plant/ per card. Four samples were pooled for each area. The compositions of FTA cards include some chemicals that act on lysing the cells, denaturing proteins, and protecting nucleic acids against the activities of nucleases, the oxidizing and UV-based damaging effects. The benefit is that nucleic acids are entrapped in the matrix fibers preventing transport-based damages, allowing immediate processing, or enhancing long-term ambient storage.

four cards were shipped to AniCon Labor GmbH I Muehlenstraße 13a I 49685 Hoeltinghausen I Germany, then viral RNA was extracted with the manufacturer’s instructions of Kyli\textsuperscript{®} RNA/DNA Purification kit.

Realtime-PCR: The real-time PCR reactions were run by AniCon Labor GmbH, Germany. Briefly, species-specific and variant-specific RT-qPCR method was utilized to identify APM-1, specific RT-qPCR Hybridization probe-based chemistry was used with the primers: (Kyli\textsuperscript{®} Paramyxovirus 1) (a).

Results

Clinical signs and postmortem exam: All layers have been vaccinated against Newcastle Disease many times, but the last vaccination was at 15 weeks old. At 18 weeks, the disaster started with infection of about 100,000 hens
Sudden onset with depression & prostration, decreased feed and water consumption. Signs of respiratory involvement showing gasping, different degrees of coughing, the presences of rales, and pronounced nasal discharge were noticed that were directly followed by CNS signs. Less than 22% have CNS signs - opisthotonus. The post mortem examination revealed inflammation with high severity of the tracheal inner surface and the air sacs, Mucosal presence of foci representing hemorrhages or necrosis in the intestines especially cecal tonsils. The proventricular and the gizzard isthmus mucosae showed severe hemorrhages with hemorrhagic spots present in the cloacae. The classical tests showed that the virus was velogenic strain as in table (1).

Table 1: HI titers and ICPI values of each section in poultry farm

<table>
<thead>
<tr>
<th>Place</th>
<th>HI titer Log*</th>
<th>MDT</th>
<th>ICPI</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Cage</td>
<td>10</td>
<td>44.3</td>
<td>1.82</td>
<td>Velogenic strain</td>
</tr>
<tr>
<td>2nd Cage</td>
<td>9</td>
<td>45.5</td>
<td>1.83</td>
<td>Velogenic strain</td>
</tr>
<tr>
<td>3rd Cage</td>
<td>11</td>
<td>44.2</td>
<td>1.80</td>
<td>Velogenic strain</td>
</tr>
<tr>
<td>4th Cage</td>
<td>9</td>
<td>45.8</td>
<td>1.84</td>
<td>Velogenic strain</td>
</tr>
<tr>
<td>5th Cage</td>
<td>10</td>
<td>46.3</td>
<td>1.81</td>
<td>Velogenic strain</td>
</tr>
</tbody>
</table>

Serological Diagnosis: Results of rapid ND Ag Test Kit showed that Fifty-four swabs out of sixty positive results for diagnosis of ND virus antigen.

Real-time PCR: The viral RNA from FTA card (4 spots pooled) showed positive results for Avian Paramyxovirus serotype 1 (Newcastle Disease Virus, aPMV-1) with a method of serotype-specific Real-Time RT-PCR (Kylt® Paramyxovirus 1) (a).

A 360 bp fragment of the fusion protein coding gene of Paramyxovirus-1 (PMV-1) has been sequenced and a conceptual translation was generated. Based on the F2/ F1 cleavage site the pathogenicity of the analyzed PMV-1 strains was classified.

Sequencing of HA gene products and phylogenetic analysis: Based on certain amino acids in the fusion protein gene the sequenced strain carries amino acids typical for velogenic strains. The isolated RNA from sample show 99% identity to strain Newcastle Disease virus (Acc.No MG871466.1) that isolated in Iran as in figure-1.

Gene bank accession number: The fusion protein (F) of the NDVs were submitted to NCBI geneBank data base. The GenBank accession number was MK034858.1 under the name Avian avulavirus 1 fusion protein (F).

Figure 1: Phylogenic tree of Newcastle disease virus Iraqi isolates using MEGA X program software.
Discussion

In spite of heavy vaccination program submitted in Iraqi farms for NDV, the last 15 years, has been recorded major economic crisis in poultry production lines in different Iraqi provinces.

This study characterizes the clinical signs, gross lesions, and antigen distribution that resulted in a commercial hen flock after infection with NDV. According to symptoms, gross lesion, high morbidity and mortality rate (78%), The suspected diagnosis was that the infection is Newcastle Disease, but unfortunately, we don’t have all the facilities in our country to make genetic diagnosis. So, the aim of this study was focused on the detection and genetic characterization of the NDV after preliminary determination of infection with rapid ND kit detection.

All the positive results of the rapid kit test, HI, MDT and ICPI confirm the diagnosis of infection with velogenic strain of NDV. However, the current work gives genetic information of the NDVs circulating in poultry farms in Iraq and we precisely detected the presence of the virus that resembling with 99% with the Iranian ND strain in cooperation with AniCon Labor GmbH, Germany.

Poultry-based commercial and backyard rearing in countries of southeast Asia is the hugest in the world with the capabilities of inducing new emergent viruses especially those of virulent sub-genotypic strains of NDV. Informational reports from neighboring countries of Iraq showed the presence of various strain-based infections in those countries; however, factors stand behind the induction of a panzootic types of infections are yet not recognized plus the availability of adequate epidemiological or retrospective information required for understanding this induction is not present.

According to the presence of ND virulent strains, variation of the pathotypic, virulence evaluation (VE) of the isolated strains must be performed after routine viral identification. ICPI, in vivo, related techniques alone can be of a limited support in the VE of the strains; however, we used all the techniques (in vivo and in vitro) that confirm the accurate diagnosis for infection.

The F-protein-360-bp-fragment-related gene of the PMV-1 has been sequenced and a conceptual translation was generated. According to the cleavage site of the F1/F2, the pathogenicity of the analyzed PMV-1 strains was classified.

Based on the presence of certain amino acids in the sequence of the fusion protein gene, the sequenced strain was assigned to the velogenic PMV-1 strains. The isolated RNA from samples show 99% identity to strain NDV isolated in Iran, the neighbor of Iraq, and that may refer to the origin of infection and to the virus that circulated in the area.

Several countries of the Asia and middle east have large population and large backyard based raised of birds with uncontrolled market selling of backyard poultry and live birds leading to enhance the virulent NDV persistence presence and evolution as sometimes due to the lack of vaccination programs that target newly hatched chicks belong to the backyard birds. The poultry ND epizootics are persisted in Asia, Africa, Central and South America; however, sporadic epizootics are reported to occur in Europe. Consistent occurrence of ND infection is found in all the globe countries. The poultry mortality rate of the ND is considered among the highest. Millions of dollars estimated annually for the losses induced by ND worldwide. The genetic similarity between Iraqi virus and Iranian virus with a 99% may be due to legal and illegal transportation of chickens between Iraq and Iran. Frequently, the NDV studies regarding the evolution of the outbreak-diagnosed viruses have been performed between time and time. However, these studies were immunogenic-based but not genomic-based investigations to understand the viral properties. In addition, the vaccine-uncontrolled use has led to risk increases in the pathogenic alterations of the NDV. According to these, it has been become as an international important interest to launch research aiming at resolving these problems using methods such as NDV-based isolation and molecular characterization, genome sequencing, partial or complete, analyses for epidemiological, immunogenic, and evolutionary based characterization, and RT-qPCR assays that should be studied for its validity to increase protection and control awareness of the ND in future.

Although this study adds new information about the pathology and antigen distribution of this novel virus, additional work is likely needed to characterize this pathogen further and make a complete procedure for vaccinating and eliminating from this disease.
Conclusion

Our findings of the in vivo and in vitro showed that the strain was pathogenic and the sequence of the amino acids were typical for virulent strain which resemble with 99% Iranian strain.

This research adds new information about the pathology and antigen distribution of this novel virus in Iraq and additional work must be done to get a complete data of viral diversity and procedure for eliminating from this disease in future.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Not required.

REFERENCES


The Determinant Factors of Child’s Immunization Status: A Cross Sectional Study on the Dayak Pitap Tribe in the District of Balangan Indonesia

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ABSTRACT

Background: Even if the immunization coverage in a region is high, but the unimmunized child gathered in one location, then the benefit from herd immunity developed will not be gained by the child in that location so the risk for outbreak vaccine preventable diseases is high. So in order to solve this problem, it is important to reach this under vaccinated population and increase the child’s immunization status of the population. The aims of this research were to describe the immunization status and its determinant factors that influenced the child’s immunization status of Dayak Pitap tribe in the district of Balangan Indonesia.

Method: A cross sectional study conducted in May to June 2018 which included the interview using a questionnaire with the mother of 12 – 35 month old child in all house hold in Dayak Pitap tribe. The independent variables were the mother’s education level, the mother knowledge about immunization, the history of mother immunization status during pregnancy and the childbirth attendant and the cultural determinant namely the aruh ritual, the papantang and the use of the samban, whereas dependent variable was the child’s basic immunization status. The uni-variable analysis and logistic regression analysis employed as the research analysis method.

Result: The complete child’s immunization status coverage was 48%. The determinant factors that significantly influenced on the child’s immunization status were the mother immunization knowledge level (p=0.000), the history of mother immunization during pregnancy (p=0.033), the history of birth attendant (p=0.000) and the using of samban by the children (p=0.012).

Conclusion: In order to gain the better child’s immunization status coverage of the Dayak Pitap tribe, it is important to develop combination interventions to give better knowledge about immunization to the mother with the tailor made material, promote birth attendant labor and reach the pregnant mother for immunization.

Keywords: Child immunization, indigenous tribe, cultural determinant.

Introduction

One of the purposes of immunization is to develop herd immunity in the community that can make all the children get benefit from the protection, including not immunized children and children who had already immunized but failure in developing antibody that can be caused by the child condition such as virus and bacterial infection(1), the nature and condition of the vaccine itself (2)(3) and the abnormalities of the immune system such as the hypogammaglobulinemia, other genetic factors and other causes that still poorly understood (4). In order to develop the herd immunity, high uptake of fully immunized children must be obtained. The problem is every country has population groups that are not fully immunized that have a consequence in the risk of vaccine-preventable disease outbreak.
Actually, in case there is a child, who is getting an infection of vaccine preventable diseases, but the high uptake of immunization has been obtained and the herd immunity has been developed, the other children will be protected because the spread of the infection had already blocked. However, this only works if unvaccinated child is scattered across geographical areas. If the unvaccinated child is gathered in one location, such as in the Dayak Pitap tribe, diseases can cause large outbreaks—even if the region or province or national vaccination coverage is high.

In this purpose, it is important to make sure that the immunization coverage in the remote areas is also high. However, based on the preliminary study that conducted in Dayak Pitap on January to March 2017, the fully immunized children coverage of the Dayak Pitap tribe was only 34.3% and from the in depth interview conducted with the traditional leaders, the balian (the traditional spiritual leader/traditional healers) and other community members, the reason for this low uptake of fully immunized children was probably because of the community belief about the causes of illnesses which are natural causes (heat, cold, rain), spirit of ancestor causes, shamanism causes, breaking taboos causes and other supra natural causes. This belief, therefore has an implication on the initiatives that they use to prevent illness, namely always conducted aruh ritual, not violate papantang and the use of a samban for their children. So besides the factors that have commonly stated as the determinant factors of the immunization coverage, in the Dayak Pitap tribe, the cultural factor such as the aruh ritual, the papantang and the samban probably also has a contribution in determining the child immunization coverage.

The aruh ritual is a ritual that conducted regularly by the Dayak Pitap tribe across the human life cycle and the rise cultivation cycle. The ritual filled with many kinds of sacred activities and materials, offerings and also rhythm that accompany the spell of the mantra and dance of the balian as the traditional spiritual leader. The absence of conducting the aruh ritual believed by the community can cause misfortunes and illnesses. The papantang or taboo is a form of oral prohibition to do something because it’s against the culture and community tradition, although there was no legal or customary sanction for the violator. The violation of papantang also believed by the community can cause misfortunes and illnesses. A samban is a kind of amulet that worn as a necklace by the child after conducting a sacred ritual and believed can protect children from illnesses.

This research conducted in the Dayak Pitap tribe that settles in the slope of Meratus highlands in Tebing Tinggi sub districts of Balangan, South Kalimantan Province, Indonesia. Although this tribe registered as Hinduism which is called Hindu Kaharingan, very little aspect of Hinduism exists in their everyday lives. They still maintain their belief and culture as animism and dynamism tribe.

Hence, the aim of this paper is to describe the immunization status and its determinant factors that influenced the child’s immunization status of Dayak Pitap tribe in the district of Balangan Indonesia.

Material and Method

This analytic observational quantitative research employed by a cross sectional design. The analysis unit was the household of Dayak Pitap tribe that had a 12 – 35 month old child. Data collected from all households that had a 12 – 35 month old child in May to June 2018 using a questionnaire. The respondent was the mother of 12 – 35 month old child.

The independent variables were the mother’s education level, the mother knowledge about immunization, the history of mother immunization status during pregnancy and the childbirth attendant and the cultural determinant namely the aruh ritual, the papantang and the use of samban, whereas dependent variable was the child’s basic immunization status.

Data analysis using the univariable analysis to describe the distribution of frequency and proportion of independent and dependent variables and logistic regression analysis to analyze the influence of independent variables toward the dependent variable.

Results

1. Socio-demographic characteristics of respondent and children of Dayak Pitap tribe: The majority of mother in Dayak Pitap were in 20 – 29 years old interval (60%) and had primary educational level (42%) and 90% were farmer. Their immunization knowledge level mostly was low (68%). Most of the mother had only one child (44%) with higher
female distribution (54%). 66% of the mother did not complete their immunization during pregnancy and 46% assisted by the traditional birth attendant when delivered their babies.

2. Immunization Status of 12 – 35 month old child of Dayak Pitap tribe

Table 1: Immunization Status of 12–35 month old child of Dayak Pitap tribe

<table>
<thead>
<tr>
<th>Village</th>
<th>Number of Child 12 s/d 35 month old age</th>
<th>HB0</th>
<th>BCG</th>
<th>DPT-HiB-HB</th>
<th>Polio</th>
<th>Measles</th>
<th>Fully Immunized Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HB0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Ajung</td>
<td>23</td>
<td>14</td>
<td>19</td>
<td>18</td>
<td>14</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Iyam</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Kambiyain</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Langkap</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>34</td>
<td>43</td>
<td>41</td>
<td>35</td>
<td>29</td>
<td>48</td>
</tr>
</tbody>
</table>

3. Logistic Regression Analysis-Backward LR Method

Table 2: Result from Logistic Regression Analysis–Backward LR Method

| Step 1 | educationlevel | -12.221 | -0.110 | 1 | 0.741 |
|        | knowledgelevel | -18.373 | -12.414 | 1 | 0.000 |
|        | historyofmotherimmunization | -13.660 | -3.005 | 1 | 0.003 |
|        | birthattendant | -18.525 | -12.718 | 1 | 0.000 |
|        | arun | -12.487 | -0.642 | 1 | 0.423 |
|        | papantang | -12.174 | -0.016 | 1 | 0.899 |
|        | samban | -14.944 | -5.556 | 1 | 0.018 |

| Step 2 | educationlevel | -12.225 | -0.101 | 1 | 0.750 |
|        | knowledgelevel | -18.489 | -12.630 | 1 | 0.000 |
|        | historyofmotherimmunization | -14.204 | -4.061 | 1 | 0.044 |
|        | birthattendant | -19.402 | -14.457 | 1 | 0.000 |
|        | arun | -12.749 | 1.149 | 1 | 0.284 |
|        | samban | -15.103 | 5.859 | 1 | 0.015 |

| Step 3 | knowledgelevel | -19.169 | -13.889 | 1 | 0.000 |
|        | historyofmotherimmunization | -14.241 | -4.033 | 1 | 0.045 |
|        | birthattendant | -19.405 | -14.361 | 1 | 0.000 |
|        | arun | -12.810 | 1.172 | 1 | 0.279 |
|        | samban | -15.306 | 6.163 | 1 | 0.013 |

| Step 4 | knowledgelevel | -19.340 | -13.060 | 1 | 0.000 |
|        | historyofmotherimmunization | -15.070 | 4.520 | 1 | 0.033 |
|        | birthattendant | -19.405 | -13.189 | 1 | 0.000 |
|        | samban | -16.003 | 6.386 | 1 | 0.012 |

Based on the table above, the dependent variables that significantly influenced the independent variables were the mother immunization knowledge level (p=0.000), the history of mother immunization during pregnancy (p=0.033), the history of birth attendant (p=0.00) and the using of samban by the children (p=0.012).
Discussion

The complete child immunization coverage in the Dayak Pitap tribe was 48%, still far from the Indonesian Health Ministry target i.e. 92.5%. The highest coverage was in Kambiyain village i.e. 88.9% and the lowest was in Iyam village i.e. 20%. The highest immunization dose coverage was Polio1 i.e. 48% and the lowest dose coverage was DPT-HiB-HB3 i.e. 29%.

Based on the data analysis conducted, the independent variables that significantly had influenced on the child immunization status of Dayak Pitap tribe were the mother immunization knowledge level, the history of mother immunization during pregnancy, the history of birth attendant and the cultural determinant namely the use of samban. Whereas the mother education level and the cultural determinant namely the aruh ritual and the papantang were not significantly influenced the child immunization status.

Many research have shown that the mother immunization knowledge correlated with the child immunization status (8)(9)(10) and influenced the child immunization. Other research also shown that the mother with good immunization knowledge has 2.21 probability to fully immunized their children compare with the mother with poor immunization knowledge (10).

In this case, develop an intervention to increase the mother immunization knowledge with the combination with the other interventions still promising in order to increase the fully immunized child coverage.

The other determinant factor that significantly influenced the child immunization status in the Dayak Pitap tribe was the use of samban. Using some kind of amulet both for protection and curing not only known in Dayak Pitap tribe but also widely known in many traditional cultures such as in Narsinghdi district in Bangladesh (11), in Bedouin tribes of the Negev Southern Israel, Middle East (12), in Gaddis of Bharmour Himachal Pradesh, India (13) and most of tribal communities worldwide especially for the children (14).

Even if the using of samban significantly influenced the child’s immunization status, the intervention of this cultural variable is not easily formulated and need further research. Intervention with poor knowledge about the culture itself can result in negative consequences and can lead to worse health outcome. However, based on this research, health professional known that the using of samban was significantly influenced the child’s immunization status of the Dayak Pitap tribe.

The history of mother immunization during pregnancy and birth attendant also significantly influenced the child’s immunization status. These two variables actually correlated with the present of the care for pregnant women and labor that usually provided by the midwife.

As states by the WHO and other references, immunization is one of the most successful and cost effective health intervention achievement, has saved countless of children’s lives and increased health status in the world (15)(16). However, virus and bacteria do not respect border, if the disease still circulate in any part of the world the risk of outbreak still remained. In order to give all protection to all children the high uptake of fully immunized children must be obtained all over the world and to reach the under vaccinated, immunization programs need to develop tailored intervention to overcome the existing barriers.

Conclusions

The child immunization coverage of the Dayak Pitap tribe was 48%, lower than the Indonesian health ministry target i.e. 92.5%. The determinant factor that significantly influenced the child’s immunization status of the Dayak Pitap tribe were the mother immunization knowledge level, the history of mother immunization during pregnancy, the history of birth attendant and the cultural determinant namely the use of samban.

Hence, in order to gain the better child’s immunization status coverage of the Dayak Pitap tribe, it is important to develop combination interventions to give better knowledge about immunization to the mother with the tailor made material, promote birth attendant labor and reach the pregnant mother for immunization.

Conflict of Interest: There is no conflict of interest for all authors.

Source of Funding: This research funded by the authors themselves. No other financial support received.

Ethical Clearance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the Health Research Ethics Committee Faculty of Public Health Airlangga University.

Informed Consent: Informed consent was obtained from all individual participants included in the study.
REFERENCES


Study Immune Response and Serum Proteins for Scabies of Sheep in Middle of Iraq

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Abstract

Current study was detected on native Awassi sheep which devided into two groups included healthy and infected animals to highlight on relationship between scabies disease and interleukin 12 (IL – 12) Concentration also relation with serum proteins and leukocytes. The research demonstrated that infection influenced significantly (P<0.05) on globulin while total proteins albumin, globulin/albumin (glo/alb) not affected by incidence, there is no importance for scabies on neutrophils, lymphocyte, monocyte and basophils in serum which were 46.6%, 45%, 6.61% and 0.30% respectively and these rates reduced in healthy animals whereas eosinophils was 1.42% (P<0.01) for infested animals, correlation coefficient between scabies and each of IL – 12 was -0.176 (P<0.05) and highly significant reached to -0.350 with eosinophils but insignificant association found for lymphocyte, monocyte, basophils with infestation and these cells negatively linked with IL-12 were 0.118, 0.225 and 0.121 also lower with eosinophils was 0.097, on contrast side, positive relation with neutrophils become 0.188.

Keyword: Leukocyte, proteins, serum, correlation, IL – 12.

Introduction

Ectoparasites diseases have a negative role in livestock progression and one of them is scabies disease which occurred because of mites types inter stratum corunea, infection still unclear until wool shedding in most of infected animals which considered as indicator for infection spreading to reflect its negative effect on skin and wool damages in addition genetic material also immune cells1, productivity reduction and toxaemia thus, constraining herds breeding development hence, regression of health status for animal which depending upon body resistance to parasites presence and their residues, infections varied among small ruminants that received to 0.88% in Nigeria, most of infections related to Psoroptic was 7.46% among Iraqi sheep2 while wide spreading to 58.3% in Basrah3. Immune response to scabies is complex, mediator cells stimulated for disease causes in skin which surrounding with pre immflamatory cells that recognized and perform to cytokines secretion which responsible for immune effect in skin4. As a result of T cells, lymphocyte, neutrophils attendance which dominated kill burdern parasite therefore, immunity for unreplicated infection with scabies due to those mediators that produce pathogens to T memory cells5.

Cytokines various markedly and their response is normal and necessary in mast circumstances also secreted with limited concentrations in blood and damaged skin in addition pro infection inhibit phagocytes ability to grow and reproduction in inflammable area6. Various proteins found in blood widely different in function which concentrate in total protein thus, abnormal value for it determine health status of animal for that this study quested relation between scabies disease and serum protein also immune cells with IL – 12

Material and Method

The research done in animal farm which found at college of Agriculture, University of Baghdad for period from 1st July to 1st October 2018 on national sheep that had bred in open door pens and demonstrated drugs for anti endo parasites also strewing with anti-parasites to avoid and reduce infections as well as ocular diagnosis with scabies was considered to ensure happening of infections among animals

Blood samples collected from jagular vein in tubs without anti agglutination then clotted for ten minutes and centrifuged at 3000 r.p.m for five minutes to get pure serum which frozen at -20°C until analysis time
Serological Analysis: Total protein was estimated by biuret method\(^7\). For having albumin concentration in serum, Bromocresol green method used\(^8\). However, by adding the quantity of non-albumin proteins, globulin concentration was calculated, alb/glo ratio was determined manually. 1L – 12 levels in serum evaluated by using E11SA Kit. Blood put in vacutainers with anti agglutination EDTA and immediately translated to laboratory for counting differential leukocytes by covering glass slide with smears of fresh blood leishaman checking through microscope

Statistical Analysis: Mean square for serum proteins: total protein, albumin globulin, alb/glo, were recorded by using General Linear Model within statistical analysis system\(^9\) depending upon breeding records for parents whom have more than five offsprings, variance was estimated by Type 1 method to determine correlation coefficient between serum proteins and immune cells with both of scabies disease and concentration of 1L – 12\(^10\).

Results and Discussion

Association between scabies and serum proteins

Total protein: Total protein not affected by scabies which was 6.49 g/dl in infected and higher to 6.64 g/dl for healthy animals (table 1), this result agree with 24 who membered that reduction of serum proteins in case of infection due to hemorrhage because of homo dilution for velonis while total protein was higher for infected Desi sheep in South of Africa\(^11\) also received to 10 g/dl and 7 g/dl for infested and healthy animals which impacted significantly in Dera sheep in Pakistan\(^12\), less values of total protein were 4.75 and 5.42 g/dl for infected and healthier respectively in west Africa Dwarf sheep\(^13\).

Albumin: Infection not influence on serum albumin which declined to 3.67 g/dl for infection whereas it rised to 4.05 g/dl with those not infested (table 1), this result came at the same direction with findings of 16 on West African Dwarf sheep about insignificantly impact. Reduction of albumin production may be refer to acut phase response which associated with globulin yield so, albumin considered negative acut phase for protein so that, changes happen at conformation of amino acids and proteins in liver and that perform to change their concentration in blood docilely hence, reduce response for inflammation because of cutaneous infection\(^11\).

Globulin: Ecto parasitological infection has significant effect (P<0.05) on globulin concentration which increased to 4.43 g/dl at infestation and lower in healthy status was 3.08 gm/dl (table 1). Reason for raising globulin levels in serum with infection may be due to globulins that mediated immune response to protect host against parasites feedings on blood, these globulins produced from mast cells as a result of monocye and T lymphocyte action which contributed to TGF production that yield globulin A in addition increasing of globulin E which response to parasite infection\(^8\).

Albumin/globulin: Values of the ratio of glo/alb was high received to 1.80 and 1.65 respectively in each of sick and healthy animals, there is no effect of the disease on this ratio (table 1), this result dealing with study of 16 about non-significant effect. High values of this ratio probably back to increasing of immune globulins in serum

Relationship between leukocytes and scabies

Neutrophils: Scabies has not influence on neutrophils which was at higher percentage reached to 49.8% Vs 46.6% for both of infection and non-infection correspondingly (table 2), contrary to this finding affected animals have less rate of neutrophils was 23.3% and raised to 30% for healthier with high significant\(^13\). Increasing percentage of neutrophils at infested cases may be come from immune mediators production which stimulated by parasites in pre infection period that inhibit ability of phagocytes to migrate to dramatic inflammation locus so, these cells act as effective factors by phagocytosis and antigen representing also implicated as means to destroy tissues by filtering cells by phagocytosis\(^14\).

Lymphocyte: These cells still within normal values out of infection effect and received to 45% for infected and 41.46% for control group (table 2). Disagree with this result those indicated that lymphocyte impacted by incidence significantly and was 55% for sick while up to 60% for healthy subjects\(^11\). Normal values of lymphocyte in serum may be translocation higher numbers of these cytes to damaged skin area more than those in blood\(^15\).

Monophils: Monophils increased to 6.61% for infestation and declined to 5.20% for healthier also these rates not affected by incidence (table 2), while this rate dipped to 20% for both of healthy and unhealthy conditions\(^11\), monocyte increased in blood and represent pathogens to T cells to form anti bodies as well as for
memory after that leave blood to convert to phagocytes which remove destructions of mortile cells with attack pathogens agents

**Eosinophils:** These cells various significantly (P<0.01) by dermatic infection which reduced to 1.42% for infections whereas raised to 3.20% for healthy animals (table 2). 16 observed that higher rate of eosinophils in skin was 7.3% for incidence while declined to 4% for control significantly. Reduction of eosinophils in serum probably go to that monocyte transfer to damaged area in skin and little of them stay in blood and recruited to Th2 expression therefore, higher number of these cells in dermatic infection as local reaction because of parasites presence and residues, mast cells estimated by complement throughout releasing mediators such as heparin and histamine which eradicate eosinophils to inflammation site16.

**Basophils:** Scabies is not effect on basophils which were 0.30% and 0.26% for incidence and healthy animals respectively (table 2), this result coupled with conclusion of 16 for non-significant of infection in basophils rate which increased to 0.67% to illness and lower to 0.33% for healthy subjects. Monocyte affected mainly by skin sensitive as response secret heparin and histamine which extended blood vessels to be more permeability to pass blood to damaged tissues also neutrophils with angulation proteins then basophils release chemical signals to bring these cells in addition to eosinophils17.

| Table 1: Means of proteins concentration ± standard error for infected and health animals |
|------------------------------------------|------------------------------------------|------------------------------------------------|
| **Proteins** | **Infection** concentration ± standard error | **Healthy** concentration ± standard error | **Significance** |
| (g/dl) | | |
| Total protein | 6.49 ± 0.11 a (47) | 6.64 ± 0.15 a (27) | NS |
| Albumin | 3.67 ± 0.20 a (49) | 4.05 ± 0.28 a (26) | NS |
| Globulin | 4.43 ± 0.36 a (49) | 3.08 ± 0.50 b (26) | * |
| Albumin/globulin | 1.80 ± 0.30 a (48) | 1.65 ± 0.43 a (24) | NS |

Means with the same letters are not significant NS : not significant * : (p<0.05)

| Table 2: Means ± standard error for immune cells for infected and healthy animals |
|------------------------------------------|------------------------------------------|------------------------------------------------|
| **Leukocytes** | **Infection** Percentage ± standard error | **Healthy** Percentage ± standard error | **Significance** |
| | n = 26 | n = 15 | |
| Neutrophils | 46.6 ± 2.28 a | 49.8 ± 3.00 a | NS |
| Lymphocyte | 45.0 ± 2.01 a | 41.4 ± 2.65 a | NS |
| Monophils | 6.61 ± 0.55 a | 5.20 ± 0.73 a | NS |
| Eosinophils | 1.42 ± 0.46 b | 3.20 ± 0.60 a | ** ** |
| Basophils | 0.30 ± 0.13a | 0.26 ± 0.17 a | NS |

Means with the same letters are not significant ** : (p<0.01)

**Correlation coefficient between immune cells and scabies disease:** Positive and insignificant association between scabies and each of lymphocytes, monophils and basaphils received to 0.167, 0.238 and 0.029 correspondingly, relation between incidence and 1L-12 concentration was -0.176 (P<0.05) and -0.350 (P<0.01) for eosinophils. Relationship between 1L-12 and leukocyte were insignificantly positive with neutrophils was 0.188 and negative reached to 0.118, 0.225, 0.121 and 0.097 with lymphocyte, monophils, basaphils and eosinophils respectively (table 3). Eosinophils has a role in exchange of phagocytosis, these cells produce 1L-12 by regulating Th1 response and increasing lymphocyte to damaged cutaneous that become folded, scaly then raised basaphils with allergy which eradicate lymphocyte, moreover, neutrophils stimulated through eosinophils to skin19, neutrophils related with 1L-12 which recruite those cells to damaged tissue19.
Table 3: Correlation coefficient between scabies, IL – 12 and leukocytes

<table>
<thead>
<tr>
<th>Immune Cells</th>
<th>Scabies n = 41</th>
<th>IL – 12 n = 39</th>
</tr>
</thead>
<tbody>
<tr>
<td>1L–12</td>
<td>-0.176 **</td>
<td>0.188 **</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>-0.135 NS</td>
<td>0.188 NS</td>
</tr>
<tr>
<td>Lymphocyte</td>
<td>0.167 NS</td>
<td>-0.118 NS</td>
</tr>
<tr>
<td>Monophils</td>
<td>0.238 NS</td>
<td>-0.225 NS</td>
</tr>
<tr>
<td>Basophils</td>
<td>0.029 NS</td>
<td>-0.121 NS</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>-0.350 **</td>
<td>-0.097 NS</td>
</tr>
</tbody>
</table>

Relation between IL – 12 with leukocytes:
Lymphocyte and neutrophils in two opposite directions while monocyte coupled with lymphocyte when IL-12 concentration 0.13 – 0.17 mg/dl, monocyte trend to top and reached to 10% with reducing neutrophils to 47% and raised lymphocyte to 45% maximum to 64% while IL – 12 received to 0.21 – 0.25 mg/dl, rate of monophils, neutrophils, lymphocyte still steady at 5%, 45% and 50% respectively, eosinophils tend up to 6% and 10% with increasing of IL – 12 concentration to 0.25 mg/dl. According to basophils, rate grow with eosinophils but not coupled with IL – 12 concentration (fig 1). Monocyte, macro phagocyte, natural kill cells control on activity of immune cells that balance function of immunity and formation immune response so, expression changes of these cells perform to infection, in the same way, lymphocyte stimulate oxidants aspects of immune mechanisms that contribute in defence against infection and regulated it by cytokins which protect immune response in resistance genetically20. Eosinophils implicated as a result for parasites and sensitive induction then secret IL – 10 and IL – 12 which influence on persistency for wide range of parasites and other pathogens21.

![Figure 1](image)

**Figure 1: about relationship between scabies disease and IL – 12 with leukocyte**

Conclusions

Present study concludes that immune globulins affected by scabies disease which has a positive relation with eosinophils and negative with IL – 12 that not associated with leukocytes in serum so that, to increasing body immunity must be providing animals with a sufficient feeding and detection more studies about genes which controlled on this disease and immunity.

Conflict of Interest: None
Source of Funding: Self
Ethical Clearance: Not required.

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Trauma Mechanism, Length of Prehospital Time and Survival Rate of Head Trauma Patient

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ABSTRACT

Background: Trauma patient’s survival rate is influenced by trauma mechanism and prehospital length time. Trauma mechanism that often happens in head trauma is caused by traffic accident and falling incident. The period between the trauma and the arrival in Emergency Department can also determine the secondary head trauma and the survival of the patient.

Aims: The aim of the study was to analyze correlation between trauma mechanism and the length of prehospital time toward the survival rate of head trauma patient.

Method: Design of the study used was a cross sectional and retrospective approach. The sample was medical record of patients with moderate and severe head trauma from January 2017 to December 2018.

Findings: The total sample was 180 medical records data. Most patients were male with total of 129 patients (71.7%) and the average age is 43.63 years old. The chi square test found that trauma mechanism and survival rate showed the value of p=0.783 while spearman rank test result between the length of prehospital time and survival rate was p=0.000.

Conclusion: Trauma mechanism has no correlation with the survival rate of head trauma, whereas the length of prehospital time has negative correlation with survival rate of head trauma.

Keywords: trauma mechanism, length of prehospital time, head trauma, survival rate

Introduction

Head trauma is a global phenomenon in the world. The prevalence of head trauma rate is increasing. There are 67 to 317 of head trauma cases per 100,000 accident cases each year(1). The average head trauma rate in Indonesia is 8.2% and East Java is in the seventh rank with 9.3%(2).

The criteria of survival rate are categorized into each death time, namely immediate death, early death, and late death(3). Meanwhile, the survival rate of patients with head trauma is influenced by trauma mechanism and prehospital time. There are 90.3% of the patients survive and 9.7% non-survive due to trauma(4). There are 243 head trauma patients in the Emergency Department (ED) only 80% survived(5).

Trauma mechanism can take form in transfer of kinetic energy such as blunt or sharp trauma. In the case of head trauma, trauma mechanism is often related to linier acceleration and rotation. Linier acceleration is linked to changes of gradient pressure in the cranial whereas rotation is related to the pressure that can change the brain position. Each head trauma mechanism has impact to influence the direction and the degree of the head trauma(6).

Trauma mechanism has direct impact on survival rate of patients with head trauma. Indonesia is the third country in Asia with 38,279 death casualty due to traffic accident(7). Traffic accident accounted for 59.6%, and 47.5% of the casualty experienced head trauma(8).

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The most common trauma mechanism is motor vehicle accident with the percentage of 81.7%\(^9\).

Trauma mechanism due to falling is the main cause of head trauma for adult (51%), with accident due to traffic accident comes second (9%)\(^{10}\). Head trauma mechanism encompassed 56.1% of traffic accident, 18.4% precipitation and 11% falling\(^{11}\). Head trauma patients due to speeding motored vehicle accident tend to experience diffuse axonal injury, and in crush injury cases the survival rate are low.

The length of prehospital time provides significant influence for survival rate of patients with head trauma. Late intervention on the head trauma can cause further damaging impact on patient who have short time to get medical attention.

The period between trauma incident and the arrival in ED can become a determinant for a secondary head trauma and survival rate\(^{12}\). The output of the head trauma patient can degrade the survival rate when the patient receive medical treatment more than 60 minutes following the incident\(^{13}\).

There are 458 patients with head trauma, 50% are dead in the first two hours following the head trauma incident\(^{14}\). This condition is due to the lack of prehospital treatment on patients with head trauma. The large proportion of head trauma patients’ death (66%) happen in the first minute and in the incident scene\(^9\).

The objective of this study was to analyze the correlation between trauma mechanism and the length of prehospital time toward the survival rate of patients with head trauma.

**Method**

This study was a cross sectional retrospective study. The sample was the medical record of patients with moderate and severe head trauma from January 2017 to December 2018. The data was taken from ED of the regional public hospital Madiun, Indonesia. The sampling technique used purposive sampling. The inclusion criteria were medical record of patients with moderate and severe head trauma aged 18 years old above. The medical record of head trauma patients’ with open cranial fracture, multiple trauma, alcohol intoxication was included to exclusion criteria.

The data was taken using observation sheet, which consists of sex, education, job, age, diagnose, means of arrival, trauma mechanism, length of prehospital time, survival rate category: immediate death, early death, late death and alive.

**Findings**

**Table 1: General Characteristics of Respondents**

<table>
<thead>
<tr>
<th>General Characteristics</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>129</td>
<td>71.7</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>28.3</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>73</td>
<td>40.6</td>
</tr>
<tr>
<td>Junior High School</td>
<td>15</td>
<td>8.3</td>
</tr>
<tr>
<td>Senior High School</td>
<td>79</td>
<td>43.9</td>
</tr>
<tr>
<td>University</td>
<td>13</td>
<td>7.2</td>
</tr>
<tr>
<td>Working Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>136</td>
<td>75.6</td>
</tr>
<tr>
<td>Not working</td>
<td>44</td>
<td>24.4</td>
</tr>
</tbody>
</table>

**Table 2: Diagnose, means of arrival, trauma mechanism, and survival rate**

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Trauma Diagnose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>82</td>
<td>45.6</td>
</tr>
<tr>
<td>Severe</td>
<td>98</td>
<td>54.5</td>
</tr>
<tr>
<td>Means of arrival (taken by)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>89</td>
<td>49.4</td>
</tr>
<tr>
<td>Police</td>
<td>91</td>
<td>50.6</td>
</tr>
<tr>
<td>Trauma mechanism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic accident</td>
<td>155</td>
<td>86.1</td>
</tr>
<tr>
<td>Fall</td>
<td>25</td>
<td>13.9</td>
</tr>
<tr>
<td>Survival Rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate death (0-60 minutes)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Early death (1-24 hour)</td>
<td>19</td>
<td>10.6</td>
</tr>
<tr>
<td>Late death (&gt;1 day)</td>
<td>69</td>
<td>38.3</td>
</tr>
<tr>
<td>Survive</td>
<td>92</td>
<td>51.1</td>
</tr>
</tbody>
</table>
Table 3: Length of prehospital time and age

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prehospital time</td>
<td>33.14</td>
<td>30</td>
<td>5</td>
<td>90</td>
<td>16.87</td>
</tr>
<tr>
<td>Age</td>
<td>43.63</td>
<td>47</td>
<td>18</td>
<td>65</td>
<td>17.01</td>
</tr>
</tbody>
</table>

Out of 494 medical records analyzed, there were 180 medical records that met the inclusion criteria. Table 1 showed the general characteristics, most respondents were male 129 patients (71.7%) and the education level of the patients was mostly Senior High School with total of 79 patients (43.9%). There were 136 patients (75.6%) who was working. Table 2 showed that respondents with severe head trauma were 98 people (54.5%). Ninety one people (50.65%) were taken to ED by their family. Head trauma mechanism that often experienced by 155 cases (85.2%) was due to traffic accident. There were 92 cases (51.1%) of head trauma patients with survive category, 69 cases (38.3%) categorized into late death and 19 cases (10.6%) categorized into early death. There were no patients of head trauma who experienced immediate death or unable to survive 60 minutes following the accident. Based on Table 3, it obtained that the average prehospital time was 33.14 minutes. The average respondent’s age was 43.63 years. The chi square test between trauma mechanism and survival rate showed p=0.783 (p>0.05), thus, there was no correlation between the trauma mechanism and survival rate of head trauma patient. Spearman rank test between the length of prehospital time survival rate was p=0.000 (p<0.05), thus, there was a correlation between the length of prehospital time and survival rate of head trauma patient. The r=-0.312 showed a negative weak correlation. It means the longer the prehospital time, the lower the survival rate of the head trauma patient.

Discussion

Trauma mechanism brings different impact on head trauma patient. Traffic accident dominates the cause of head trauma in Madiun. National data shows that 65.6% of traffic accident is caused by crash(15). Traffic accident that causes head trauma in Madiun are mostly due to two-wheeled vehicle accidents. National data shows that the number of two-wheeled vehicle in Indonesia is about 113 million(16). In Madiun, the number of two wheeled vehicle accounted for 94% of the total vehicles, and it becomes the main cause of traffic accidents(17).

Another main cause of head trauma in Madiun is falling from height. This type of falling is falling from trees, cliffs, and roofs. The average height that causes head trauma patients to be admitted to the ED is 2 – 5 meter. The falling contributes 21% to the head trauma case, in which 12% of them are due to the falling from the height of > 3 meter, and 9% are due to the falling from the height of <3 meter(18).

The analysis between trauma mechanism and survival rate showed that there was no correlation between trauma mechanism and survival rate. The head trauma mechanism is influenced by several factors that contribute to the different degree of severity among patients in anatomically and reconstructive way. Anatomic study investigates the brain network of the head trauma patient, whereas reconstructive study investigates the process of head trauma up to the impact, which aims to find the correlation between acceleration, pressure, and tension with the impact in head trauma(19). The other factors that can influence trauma mechanism are environmental condition, clinical condition, mechanical responses, also level of physical tolerance and biological factor of individuals(20).

Each head trauma mechanism has impact that influences the direction and degree of the head trauma impact(6). Brain trauma can occur post head traumatic incident due to acceleration deceleration and rotation of the head that produces kinetic power and manifested on the disturbance of neurons mechanism and axonal diffuse disorder. Trauma mechanism based on the linear acceleration is linked to the changes of gradient pressure within the cranial. Rotation mechanism is related to the pressure which can changes the position of brain networks. Trauma mechanism due to the blast and non-blast injury can cause different complication due to the primary and secondary exposures(21).

The average length of time from the accident scene to the ED is 33.14 minutes. The average prehospital time is 37 minutes and the most prominent one is in the first 30 minutes(22). The total prehospital time needed is 45 minutes, principally patient will have better survival rate when arrived in the hospital within the first 60 minutes(23).

Head trauma is a time sensitive condition due to pathological process of the head trauma. Head trauma patients spent much time in prehospital without receiving any definitive medical treatment due to many factors(24).
The principle of head trauma destruction is based on primary and secondary time. Primary head trauma is the initial destruction of brain following the trauma incident. This damage causes brain edema or laceration of brain network and its surrounding area\(^{(25)}\). Secondary head trauma evolves for several hours and days following the initial trauma incident. Secondary head trauma causes complex pathological process and complication of primary brain trauma. Time is considered as important factor for the head trauma patient. The principle underlying the trauma care is golden hour, with the treatment following the head trauma incident consists of resuscitation, stabilization, and transportation\(^{(26)}\).

The arrival of patient at ED of the regional public hospital Madiun is classified into two types, taken by the family and police. The average prehospital time taken by family is 26.4 minutes and 39.8 minutes taken by police. The Emergency Medical Service (EMS) in Indonesia is currently developing. Most areas in Indonesia are immediate assistance to patients with head trauma on a highway managed by family or police. The head trauma patients' arrival in ED who are taken by the patient's family is faster than those taken by the police, as it is easier for the family to reach the head trauma patient at the incident spot and immediately take patient the head trauma patient to the ED compared to waiting for the police or medical officers, which cannot be ensure their arrival time.

The length of prehospital time needed to take head trauma patient to the medical center with personal transportation and EMS\(^{(27)}\). The result showed that private transportation takes 46 minutes and EMS takes 59 minutes. Private transportation is faster so it can shorten the prehospital time, thus, it brings benefit to accelerate the head trauma patient’s arrival at the ED and can increase the survival rate. However, private transportation can also slow down the medical intervention that should be immediately provided for patients with head trauma. Based on the findings of this study, the average time suggested for good survival rate of the head trauma patient is 27.67 minutes with the maximum of 30 minutes.

**Conclusion**

In general, this findings outlines that trauma mechanism has no correlation with the survival rate of head trauma patient, whereas the length of prehospital time has negative correlation with survival rate of the patient with head trauma.

**Conflict of Interest:** There is no conflict of interest.

**Source of Funding:** This study was funded by *ASOSIASI PERGURUAN TINGGI KATOLIK INDONESIA*.

**Ethical Clearance:** Taken from the health ethics committee in medical faculty of *Universitas Brawijaya* No. 93/EC/KEPK-S2/03/2019.

**REFERENCES**


The Utility of PSA, PCA3 in Detection of Men with Prostate Tumors

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ABSTRACT

Objective: verify the utility of measuring prostate cancer antigen 3 (PCA3) and serum PSA levels in the diagnosis of prostate cancer.

Method: This case-control study conducted from March 2017 to November 2018. It consisted of 140 men subjects with age range (40-85 years); 70 prostate cancer patients group included (35 patients with newly diagnosed Pca and 35 prostate cancer patients under hormonal therapy treatment (HT-Pca) and 35 patients with benign prostate hyperplasia (BPH) and 35 healthy men age matched normal control.

Results: The PCA3 and serum total and free PSA were measurement by using ELISA technique in patients and healthy controls. The results revealed that the mean values of PCA3, serum total and free PSA and the prostate Specific antigen density (PSAD) of prostate cancer patients and hormonal therapy group were significantly higher compared with healthy controls (all p-value <0.001) the mean of the percentage free/total PSA Ratio were significantly lower than those of benign prostate hyperplasia and healthy controls.

Conclusion: The diagnostic value of PCA3 is relatively higher, as it of both sensitivity and specificity; increased serum PCA3 values cannot be detected in presence of other cancers. PCA3 level in serum can discriminate early Pca from healthy controls, indicating its diagnostic value for the early-stage Pca.

Keywords: prostate cancer antigen, prostate cancer, marker, benign prostate hyperplasia, stage

Introduction

Prostate cancer is a testosterone–driven cancer that typically present in men over 40 years also is the second most common solid tumor, in men worldwide and, is also one of the leading cancer deaths in developed countries throughout the world, with about with about 1 in 8 developing despite significant advances in early diagnosis and management, remains a leading cause of cancer related death in men. Almost all prostate cancers are adenocarcinomas. Other types of prostate cancer include: Sarcomas, Small cell carcinomas, neuroendocrine tumors and transitional cell carcinomas and other types are rare. The benign prostatic hyperplasia also called benign enlargement of the prostate is noncancerous increase in the size of the prostate. In this disease the prostate gland enlarges beyond the normal volume of 20 – 30 mL as part of the aging process, thus it is common among older men.

Prostate specific antigen (PSA) is serine proteases produced by epithelial cells in the prostate encoded by the kallikrein-related peptidase 3 (KLK3) gene located in the long arm of chromosome-19 within the region the spanning q13.2 – q13.4. The circulating levels of PSA increase in the presence of cancer, this latter association led to the development of PSA as a screening biomarker and an indicator of the disease progression. However, PSA is also influenced by age, prostate size, inflammation
and infection\textsuperscript{4,5}. The PSAD is described as the ratio of total PSA concentration to the prostate volume (PV), (tPSA/PV), it requires the transrectal ultrasound (TRUS) or magnetic resonance imaging (MRI) to assess the prostate volume. The PSAD is describes as the difference in mean PSAD between men with Pca and men with BPH. This measurement could be used to predict the clinical pathological features of disease\textsuperscript{6}.

Prostate cancer antigen 3 PCA3 (previously referred as DD3) is a gene composed of 4 exons and 3 introns and is located on the chromosome 9q21-22 in antisense orientation within intron 6 of the prune homolog 2 gene or BMCCI. The PCA3 gene is transcribes a long non-coding mRNA that is overexpressed in the prostate cancer tissue\textsuperscript{7}. The PCA3 mRNA is a highly overexpressed in 95% of Pca as compared to BPH or normal prostatic tissue\textsuperscript{8-10}. The PCA3 is useful in the detection of early prostate cancer, especially for patients with previous negative biopsy. And the FDA has recommended using a cut off value of 25 for the PCA3 test to indicate the repetition of biopsy\textsuperscript{9,10}. The purpose of this study was to verify the utility of measuring prostate cancer antigen 3 (PCA3) and serum PSA levels in the diagnosis of prostate cancer.

Method

Setting: This case- control study was achieved at the Department of Uro-surgery at Al-Imamain Al-Kadhumain Medical City and Baghdad Medical City Hospital (Gazi Al-Harery) and Al-imam Aljwad Medical Center in Baghdad, Iraq, from March 2017 to November 2018.

Subjects: It consisted of 140 men subjects with age rang (40- 85 years); 70 prostate cancer patients group included (35 patients with newly diagnosed Pca and the 35 prostate cancer patients under hormonal therapy) and 35 patients with benign prostate hyperplasia (BPH) and 35 healthy men age matched normal control

Exclusion Criteria: Patients with previous diagnosis of Pca or a family history record of Pca were excluded. Patients with symptoms of urinary tract infection, immunodeficiency disorders, patients under medical treatment for prostate hyperplasia, were also excluded.

Laboratory Analysis: The whole blood samples was taken prior to surgery for prostatectomy or fine needle aspirate or TURP biopsy 5 milliliters (ml) of venous blood samples were aspirate from all patients and control group. The aspirated blood sample allows clotting and centrifuged at 3500 rpm to 5 minutes, the sera was transferred to divided into two partitions: the first partitions contains 3 mls which were immediately stored at -70°C to be used for the measurement of serum prostate cancer antigen 3(PCA3) and the second partitions contains 3 mls to be used for the measurement of serum total and free PSA.

Statistical Analysis: A statistical study using SPSS version 21 statistical software (SPSS Inc., Chicago IL, USA) was performed to indicate the presence of significant difference and correlation between the studied parameters, with the p- value of less than 0.05 was considered significant. The diagnostic accuracy of the biochemical were performed by the Receiver operating characteristic curve analysis (ROC).

Results

Table 1 illustrate the difference in different clinical variables between patients and control.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pca, N=35 Mean ± SEM</th>
<th>HT-Pca, N=35 Mean ± SEM</th>
<th>BPH,N=35 Mean ± SEM</th>
<th>Control, N=35 Mean ± SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>65.85 ± 1.27</td>
<td>66.82 ± 1.31</td>
<td>64.62 ± 1.5</td>
<td>64.7 ± 1.9</td>
<td>NS</td>
</tr>
<tr>
<td>Size of prostate</td>
<td>52.5 ± 5.68</td>
<td>71.43 ± 5.98</td>
<td>80.08 ± 3.18</td>
<td>25.83 ± 0.95</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>tPSA ng/ml</td>
<td>33.45 ± 5.35</td>
<td>50 ± 6.11</td>
<td>4.06 ± 0.45</td>
<td>0.96 ± 0.14</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>fPSA ng/ml</td>
<td>4.39 ± 0.79</td>
<td>7.61 ± 0.86</td>
<td>1.13 ± 0.08</td>
<td>0.63 ± 0.07</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>F/T PSA%</td>
<td>13.1 ± 0.87</td>
<td>15.2 ± 0.67</td>
<td>32.0 ± 2.75</td>
<td>65.6 ± 1.95</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>PSAD</td>
<td>0.63 ± 0.07</td>
<td>0.70 ± 0.080</td>
<td>0.05 ± 0.010</td>
<td>0.03 ± 0.003</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>PCA3</td>
<td>67.09 ± 3.35</td>
<td>73.06 ± 5.73</td>
<td>21.31 ± 1.85</td>
<td>10.31 ± 0.57</td>
<td>P&lt;0.0001</td>
</tr>
</tbody>
</table>

Pca: Prostate cancer patients, HT-Pca: Prostate cancer under Hormonal therapy, BPH: Benign prostatic hyperplasia, SEM: sundered error of mean, NS: No significant
Table 2 illustrate the pathological characteristics for prostate patients.

Table 2: The pathological characteristics of prostate cancer patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Prostate cancer N = 35</th>
<th>Under Hormonal therapy N = 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNM Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>6(17.14 %)</td>
<td>3(8.58 %)</td>
</tr>
<tr>
<td>II</td>
<td>14(40 %)</td>
<td>10 (28.58 %)</td>
</tr>
<tr>
<td>III</td>
<td>12(34.28 %)</td>
<td>16(45.71 %)</td>
</tr>
<tr>
<td>IV</td>
<td>3(8.58 %)</td>
<td>6(17.14 %)</td>
</tr>
<tr>
<td>Gleason Score (GS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.S = 6</td>
<td>6(17.15%)</td>
<td>4 (11.42 %)</td>
</tr>
<tr>
<td>G.S = 7</td>
<td>19(54.28 %)</td>
<td>14 (40.1 %)</td>
</tr>
<tr>
<td>G.S = 8</td>
<td>8(22.85 %)</td>
<td>13(37.15 %)</td>
</tr>
<tr>
<td>G.S = 9</td>
<td>2(5.72 %)</td>
<td>4 (11.42 %)</td>
</tr>
</tbody>
</table>

As shown in table 3, the optimal cutoff value for positive serum PCA3 when used as a test to diagnose prostate cancer was set at 45 at this cutoff value the test sensitivity, specificity and accurate was (80 %, 78 %, 93%) respectively. The testing positive at this cutoff value (having as serum PCA3 more than 45 would establish the diagnosis of prostate cancer with 98.5 confidence (PPV=98.5). the optimal cutoff value for positive serum PSA when used as a test to diagnose prostate cancer was set at 5.6 at this cutoff value the test sensitivity, specificity and accurate was (82 %, 68 %, 78 % respectively) associated with diagnosing prostate cancer.

Table 3: Receiver operator of characteristics curve (ROC) analysis of Tumor markers

<table>
<thead>
<tr>
<th>Tumor markers</th>
<th>Cut off value</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Diagnostic accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total PSA in cancer with control</td>
<td>5.6 ng/ml</td>
<td>82 %</td>
<td>68%</td>
<td>78 %</td>
</tr>
<tr>
<td>Free PSA in cancer with control</td>
<td>3.5 ng/ml</td>
<td>84 %</td>
<td>78 %</td>
<td>84 %</td>
</tr>
<tr>
<td>PSAD in cancer with control</td>
<td>0.20</td>
<td>80 %</td>
<td>75 %</td>
<td>75 %</td>
</tr>
<tr>
<td>PCA3 in cancer with control</td>
<td>45.0</td>
<td>80 %</td>
<td>78 %</td>
<td>93 %</td>
</tr>
</tbody>
</table>
Table 4 illustrate the association between PSA and PCA3 with various variables.

Table 4: Correlation of PSA and PCA3 in prostate cancer patients with prostate size, age and the Gleason score

<table>
<thead>
<tr>
<th></th>
<th>Prostate size in HT Pca</th>
<th>Prostate size in Pca</th>
<th>Gleason score - HT Pca</th>
<th>Gleason score - Pca</th>
<th>Age</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>p</td>
<td>r</td>
<td>p</td>
<td>r</td>
<td>p</td>
</tr>
<tr>
<td>PCA3</td>
<td>-0.052</td>
<td>0.766</td>
<td>-0.051</td>
<td>0.796</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA</td>
<td>0.572**</td>
<td>0.005</td>
<td>0.566**</td>
<td>0.005</td>
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<td></td>
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<tr>
<td>Age</td>
<td>0.566**</td>
<td>0.0001</td>
<td>0.561**</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCA3</td>
<td>-0.064</td>
<td>0.742</td>
<td>-0.067</td>
<td>0.753</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)

Discussion

Serum level concentration of TPSA was significantly higher in Pca patients and Pca patients under hormonal therapy (HT-Pca) as compared with BPH patient groups and normal control (p-value<0.001). Serum level concentration of fPSA were significantly higher in Pca patients and Pca (HT-Pca) patients as compared to BPH patient groups and normal control (p<0.0001). During prostate cancer progression, excess amounts of PSA are leaked into the blood dramatically elevating both tPSA and fPSA levels this may occur because PSA molecules (34 kDa glycoproteins) in prostate adenocarcinoma cells more readily cross the multiple barriers between the prostate and blood vessel. It has been suggested that Pca cells produce more PSA than normal cells. It is proposed that poorly differentiated Pca cells may secrete and release greater amounts of PSA than well-differentiated ones11. This observation agrees with other study12, 13 and contrast with other study14. Significant positive correlation was found between the age of the patients, Gleason grade, pT staging, with PSA values and fPSA values. This finding is agreements with15, 16, and different from results of Djavan et al17.

The mean PSAD was significantly higher in Pca and HT-Pca as compared to BPH group and healthy control group (p<0.001). The ROC curve analysis revealed that PSAD was a better predictor of prostate cancer. When PSAD value increased the sensitivity and specificity to detection of prostate cancer increased (80% and 75% respectively). Our results are found significant correlation between PSA, %fPSA and PSAD to diagnostic the prostate cancer. This was agreements with other18. Our results indicated that PCA3 value is not affected by patients’ age, the size of prostate. These finding are also confirmed by other19, 20.

Our results found that the values of PCA3 test a significantly highly in the two group the Pca patients and HT-Pca patients as compared to BPH patient group and normal control (p<0.001). Also a significant positive correlation was found between PCA3 values with increasing GS (G.S ≥ 7) and TNM staging. The sensitivity and specificity (80% and 87 %) of PCA3 were a significantly highly in Pca patients and HT- Pca patients (86 % and 85 %) as compared to BPH patient groups and normal control. This was agreements with other15, 21, 22. While other study showed that there was no significant relationship between PCA3 with any Pca prognostic parameter including Gleason Score, tumor volume or stage23, 24.

Conclusion

The summation of PCA3, PSA, f/tPSA and PSAD with other clinical information increase the diagnostic precision of prostate cancer detection. PCA3 is a new biomarker that could be improve the accuracy of Pca diagnosis due to its fairly high specificity and sensitivity and the most promising due to its great role in distinctive of Pca from other prostate benign conditions. Also could be applied for early diagnosis of Pca, patient follow-up, prognosis prediction, and targeted therapy. The PCA3 value correlates with the chance of a positive biopsy. Addition to better detection, using this parameters may prevent invasive diagnostic procedures such as prostate biopsy

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by Scientific Committee of the college of medicine, Al-Nahrain University.

Source of Funding: The work were supported by authors only
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Staphylococcus Aureus and Bacillus Cereus in Yellow Rice

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1Medical Laboratory Technology Poltekkes, Kemenkes Banjarmasin, Mistar Cokrokusumo Street 4a Banjarbaru Indonesia

ABSTRACT

Yellow rice is one type of food made from rice cooked together with coconut milk and spices. This food is very popular with Indonesian people at breakfast. Carbohydrates contained in rice are the body’s provisions for activities until lunchtime arrives, but if food sanitation factors such as human factors, equipment factors, and environmental factors are not considered it will cause yellow rice vulnerable to contamination with pathogenic bacteria. One of the pathogenic bacteria that often contaminate food and beverages is Staphylococcus aureus and Bacillus cereus. This study aims to determine whether or not there is contamination of Staphylococcus aureus and Bacillus cereus bacteria in yellow rice sold in Sekumpul Martapura Village. The type of research used is a descriptive survey. Samples were taken in total sampling, 15 samples of yellow rice from different sellers. The results showed that 1 sample (7%) contaminated with Staphylococcus aureus, and as many as three samples (21%) contaminated with Bacillus cereus. The conclusion of the study was that there was contamination of Staphylococcus aureus and Bacillus cereus in yellow rice which were sold in the Sekumpul Village of Martapura Indonesia. Based on these studies it is recommended for sellers to always pay attention to food sanitation, especially in terms of processing to serving so that quality food obtained.

Keywords: yellow rice, Staphylococcus aureus

Introduction

Food is a source of energy for the human body, with good food intake we can do all activities. Food and drink can act as agents of transmission of disease from bacteria to humans. There are so many ways to spread pollutants in food processing. Therefore food processing and packaging plays a vital role in efforts to improve food health. A useful method of processing is that there is no food damage due to improper handling, and the packaging and presentation of food needs to consider so that the food is protected from contamination by bacteria. Bacteria that are proven to cause Extraordinary Events are Salmonella, Staphylococcus aureus, Clostridium perfringens, Clostridium botulinum, Bacillus cereus, Vibrio parahaemolyticus, Escherichia coli, Campylobacter jejuni.

Staphylococcus aureus is the species that most often causes poisoning and produces enterotoxin. The resulting enterotoxin causes food poisoning with a period of shoots between 2-6 hours. Sudden symptoms that arise are nausea, vomiting, and diarrhea.

The results of the Maulida study found the presence of Salmonella sp in 4 samples from 16 samples of yellow rice sold in Kelurahan Sungai Besar Banjarbaru. Salmonella sp can also contaminate siomay.

The case of mass poisoning that occurred in the area behind the Jami mosque of Teluk Dalam Banjarmasin, where as many as 92 residents experienced food poisoning after eating nasi bungkus (yellow rice), according to the results of a health laboratory examination of food samples and vomiting of victims, Staphylococcus aureus. A case of poisoning that occurred at the State Islamic University of Antasari Banjarmasin, as many as 21 students experienced poisoning after eating food in the form of chicken side dishes and eggs and beans, from the results of tests conducted by the Banjarmasin Health Service, Staphylococcus.
Foods that we often consume are rice; various rice processing is done to reduce boredom towards the types of food wasted every day, one of which is yellow rice. Yellow rice consumed as breakfast, there are many traders who sell yellow rice, one of which is in the Sekumpul Martapura village which is a densely populated area. Food consumed should be free from pollution caused by processing and serving which does not pay attention to hygiene and environmental cleanliness.

This study aims to determine the contamination of Staphylococcus aureus and Bacillus cereus bacteria in yellow rice which are processed and sold at the regional food stalls at Sekumpul Martapura.

Method and Materials

The type of research used in this study is the representative survey, which is a research method with the primary aim to make a description or descriptive of the presence or absence of Staphylococcus aureus in yellow rice which is processed and sold alone in food stalls in Sekumpul Martapura Village.

The design of the study in this study was cross-sectional. Namely, researchers conducted observations or measurements of variables at one particular time. The population in this study were all yellow rice sellers who processed and sold themselves at food stalls in Sekumpul Martapura Village. The sample in this study were 15 sellers who prepared and sold at food stalls in Sekumpul Martapura Village. Sampling uses total sampling technique. The research variables used in this study were independent variables, namely the bacteria Staphylococcus aureus in yellow rice.

Samples in the form of yellow rice sold at Sekumpul Village, Martapura, and only yellow rice is taken on the same day for inspection, coded for each sample and immediately taken to the laboratory for examination. Yellow rice samples crushed with mortars and stampers which sterilized with 70% alcohol, the samples were weighed as much as 10 grams and then put into enrichment media, TSB, then incubated at 37°C for 1 x 24 hours.

From TSB enrichment media using sterile swabs inoculated on MSA (Merck) and agar chocolate (Merck) media then using the ose to be pulled by zigzagging. Incubate at 37°C for 1 x 24 hours. Observations were made after 1 x 24 hours by observing S.aureus and Bacillus cereus colonies. The colonies examined with Gram staining. Suspected colonies of Staphylococcus aureus then identified by coagulase test, catalase test, biochemical test (glucose and mannose), D-Nase test, novobiocin sensitivity test. Alleged colonies of Bacillus cereus identified by biochemical tests (glucose, lactose, mannose, maltose, saccharose, indole, motility, citrate).

Result and Discussion

Based on the results of the examination of yellow rice sold in Sekumpul Martapura Sub-District from 15 identified samples, one sample (7%) contaminated with Staphylococcus aureus. And three samples (21%) infected with Bacillus cereus.

Based on the results of observations of respondents it is known that almost all yellow rice sellers pay less attention to food sanitation either from food factors, the presentation of the food itself or the equipment used. Observation data is that all yellow rice sellers (100%) use well water sources. Selling yellow rice where it trades close to public roads, there are 14 sellers (93%), where there are lots of flying flies, there is one seller (7%). Yellow rice sellers who washed their hands before serving food had six sellers (40%), while those who did not remove their hands before serving the food were nine sellers (60%). Yellow rice sellers (100%) use oil paper as a yellow rice wrapper. Yellow rice sellers who wash their hands before milking the coconut milk have 12 sellers (80%), while those who don’t wash their hands because of using instant coconut milk there are three sellers (20%).
Table 1: The results of Gram colony staining on plate media

<table>
<thead>
<tr>
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<th>Color</th>
<th>Properties</th>
</tr>
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<tbody>
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<td></td>
<td>Bacil</td>
<td>Purple</td>
<td>Gram (+)</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Bacil</td>
<td>Purple</td>
<td>Gram (+)</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Coccus</td>
<td>Purple</td>
<td>Gram (+)</td>
</tr>
<tr>
<td>4</td>
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<td>Coccus</td>
<td>Purple</td>
<td>Gram (+)</td>
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<td>Gram (+)</td>
</tr>
<tr>
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<td>Purple</td>
<td>Gram (+)</td>
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</tr>
<tr>
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</tr>
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</tr>
<tr>
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</tr>
<tr>
<td>15</td>
<td></td>
<td>Bacil</td>
<td>Purple</td>
<td>Gram (+)</td>
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Table 2: Biochemical Test Results for Coccus Form Bacteria

<table>
<thead>
<tr>
<th>No Sample</th>
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<th>Coagulase test</th>
<th>D-Nase</th>
<th>Catalase test</th>
<th>Glukose</th>
<th>Mannose</th>
<th>Bakteria</th>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>4</td>
<td>Intermediate</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>Staphylococcus sp</td>
</tr>
<tr>
<td>8</td>
<td>Intermediate</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Staphylococcus sp</td>
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<tr>
<td>10</td>
<td>Resistent</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Staphylococcus sp</td>
</tr>
<tr>
<td>11</td>
<td>Intermediate</td>
<td>+</td>
<td>-</td>
<td>+</td>
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<td>+</td>
<td>Staphylococcus sp</td>
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</table>

Table 3: Biochemical Test Results for Rod Form Bacteria

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<th>Laktose</th>
<th>Mannose</th>
<th>Maltose</th>
<th>Saccharose</th>
<th>Indole</th>
<th>Motil</th>
<th>Citrat</th>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>Bacillus sp</td>
</tr>
<tr>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
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<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Bacillus cereus</td>
</tr>
<tr>
<td>9</td>
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<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Bacillus sp</td>
</tr>
<tr>
<td>12</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Bacillus sp</td>
</tr>
<tr>
<td>13</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Bacillus sp</td>
</tr>
<tr>
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<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Bacillus sp</td>
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<td>15</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Bacillus sp</td>
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</tbody>
</table>

Based on the results of examination of yellow rice samples, there was a positive result of 7% contamination of Staphylococcus aureus and 21% Bacillus cereus (figure 1). Contamination of yellow rice depends on food sanitation in terms of environmental conditions, cleanliness of the equipment used, personal hygiene and the state of raw materials.
At the time of processing until the presentation stage, it is necessary to pay attention to the cleanliness of the cooking utensils used and the food containers and wrappers used. Of the 15 sellers who use oil paper wrappers, there are six sellers (40%) who do not clean food wrappers or who clean there are nine sellers (60%). One positive result of Staphylococcus aureus obtained on samples whose packaging not cleaned and 14 other samples contaminated with other bacteria. Based on the research of Maulida (2013) there were 3 positive samples of Salmonella and 17 other bacterial samples in the yellow rice sample. Microbial contamination can be through cooking utensils and food wrappers and food storage containers that not cleaned when they want to use, even though re-cleaning of equipment used is an action to avoid contamination during processing, serving and storing.

The condition of the raw material for coconut milk and water sources used to milk coconut milk plays an essential role in the food processing process. The results of the examination showed that using well water sources for processing yellow rice obtained the results of all samples contaminated by bacteria, and there was one positive sample infected with Staphylococcus aureus. The cause of contaminants for microorganisms for groundwater can come from domestic wastewater, either in the form of leach or leakage from septic tanks. Roebikato’s research shows a bacteriological quality of fresh water is not good.

Processing yellow rice using milk coconut is one source of contamination by bacteria because sanitation is in the process of milking and the environment for processing yellow rice and the method of cooking food that does not mature properly, cooking food until it is fully cooked can kill most bacteria. Staphylococcus aureus is a bacterium that is not heat resistant (100°C) and is inhibited by growth in high salt-containing media. Staphylococcus aureus frustrated by an increase with propolis and honey. The presence of Staphylococcus aureus in yellow rice may not originate from raw materials and the processing process because the cooking process of yellow rice reaches temperatures (100°C) for 25 minutes. Unlike the case with Bacillus cereus which is resistant to high heating. Yellow rice contamination of these bacteria is likely to come from raw materials. Bacillus sp is a spore-forming bacterium that spread in the environment including laboratory air. Food poisoning can be caused by Bacillus cereus with types of diarrhea poisoning and emetic syndrome. Foods that often contaminated with bacteria include rice cooked and honey.

Personal hygiene of sellers is seen from the habit of washing hands before serving food and the presence of festering wounds especially in the hands of sellers. Staphylococcus aureus in humans can found in the perianal, inguinal, axillary and nasal areas. In career, individuals have a higher risk of transmitting this bacterium, in diabetic or paramedic nose ulcers. Staphylococcus aureus can be contagious as long as there is pus coming out of the lesion or nose. Sellers who washed or cleaned their hands before serving the food had 6 sellers (40%) the results of the study did not find Staphylococcus aureus but found other bacteria and those who did not wash their hands were 9 sellers (60%), one of the sellers who did not wash their hands got a positive staphylococcus result aureus and 8 contaminated with other bacteria. Based on Ratih’s research, Staphylococcus aureus has infected sauces. Rahayu’s study (2014) found that from 24 sausage samples there were 12 samples contaminated with Staphylococcus aureus, this might be due to contamination originating from the soil when cutting, skin, tools or air and traders handling food. Individual hygiene is essential because it is one of the factors in serving food that must meet requirements such as the health and cleanliness of the seller.

The environment around the place of sale significantly affects yellow rice pollution by bacteria. As many as 14 yellow rice sellers sell near public roads, and one seller (7%) whose selling environment is flying flies. Yellow rice sellers pay less attention to environmental hygiene, as evidenced by the garbage around the selling place that can invite flies. Flies or insects can carry microorganisms on the rice that are not tightly closed. Contamination can also come from dust in flying air. Staphylococcus aureus and Bacillus cereus can be transmitted through the air and contaminate yellow rice.

Conclusion

The yellow rice samples examined found 1 sample (7%) contaminated with Staphylococcus aureus and three samples (21%) infected with Bacillus cereus.

Ethical Clearance: Taken From Health Research Ethics Committee Politeknik Kesehatan Banjarmasin

Conflict of Interest: Nil

Source of Funding: Self
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Effect of Adding Peppermint Oil in Total Gas, Methane Production Gas and Invitro Digestibility

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ABSTRACT

The study was carried out in animal feeding laboratory/Department of Animal Production the college of Agriculture, University of Baghdad for the period from 2016/11/1 to 2017/4/1. Peppermint oil was added by 0, 70, 140 and 280 μl/kg dry matter mixture ration (concentrated 20% and alfalfa hay 80%), to study the effect on total gas, methane production and invitro digestibility. The results as follows: A significant decreased (p<0.01) was found in total gas production, which was lower after 12 hr. were 26.55 ml/200 gm dry matter in T4 compared to T1 (control), while methane production were significantly decreased (p<0.01) in T2, T3 and T4, respectively, with adding 70, 140 and 280 μl/kg dry matter compared with T1. After 24 and 48 hr. of incubation, T4 recorded the lowest volume of total gas while methane production was a significant decreased (p<0.01) in the T3 and T4, for both periods compared to T1 treatment, after 72 hr. of incubation period treatment T4 recorded is lost significant decreased (p<0.01) in methane gas production compared to the treatment T1.

The results showed increased significantly (p<0.01) in the invitro digestibility of dry matter and of metabolizable energy in T2 and T3 except T4 and increased (p<0.01) in the T2 treatment in the invitro digestibility of organic matter except T4. We conclude that addition of peppermint oil to the ration diet has given better results in reducing the production of total and methane gas and led to a significant improvement in invitro digestibility of dry matter, organic matter and of metabolizable energy.

Keywords: Total gas, methane production, alfalfa hay, invitro digestibility

Introduction

The production of methane gas is an effective mechanism to reduce the amount of carbon dioxide and to dispose of the hydrogen gas formed in the rumen. The amount of gas produced is the result of the process of fermentation of various organic materials. These gases include hydrogen gas, hydrogen sulfide, methane and carbon dioxide. In the ruminants varies depending on several factors: animal type, strain, rumen pH, estic acid ratio, propionic, ration composition, and animal fodder quantity\textsuperscript{1}. The production of methane in ruminants is similar to that of organic fertilizer\textsuperscript{2}. Methane is hotter than carbon dioxide 23 once\textsuperscript{3}. The production of laboratory gas gives an indication of the quality of rumen fermentation, which is a fast and inexpensive way to estimate the nutritional value of fodder. It was therefore important to conserve feed capacity by reducing the composition of methane by using some plant-based feed additives that could modify the internal environment of microscopic rumen\textsuperscript{4}. These dietary alternatives are plant extracts and essential oils, essential oils that are antimicrobial as an alternative to the chemical and antibiotic preparations used to treat the microbial activity within the rumen\textsuperscript{5}. Over the past few years, there have been several studies on the use of vegetable oils and their active constituents on microbial fermentation in the rumen\textsuperscript{6}. Microbial fermentation in the rumen is also a major source of methane production, which is called greenhouse gas. The use of vegetable oils and their components reduces the production of methane 9 and reduces its emissions at high rates of the ruminant gastrointestinal tract. There are several different types of vegetable oils, including peppermint oil, which is the most versatile vegetable oil. Its unique chemical composition makes it useful in a large number of industries and applications of use, including in the pharmaceutical industries such as tooth soap and mouth washes. It is used as an appetizer, Mint
oil mainly contains menthol, which is considered as one of the oil compounds, which helps to alleviate some cases of back pain and nasal congestion. The aim of this study is to add peppermint oil with different proportions to the ruminants’ diet consisting of 80% drys with 20% concentrated feed and to study their effect on the total gas and methane production in the laboratory and measure the invitro digestion after different laboratory incubation periods.

**Material and Method**

**Experiment Aim:** To determine the effect of using different levels of peppermint oil in the diet was added by 0, 70, 140 and 280 μl/kg dry matter mixture with (concentrated 20% and alfalfa hay 80%), to study the effect on total gas, methane production and invitro digestibility.

**Experiment Plan:** The study was conducted in the Nutrition Laboratory of the Faculty of Agriculture/University of Baghdad to study the effect of adding different levels of peppermint oil in percentages 0, 70, 140 and 280 μl/kg dry matter, into a ration mixture with concentrated feed and alfalfa hay in effect to some rumen fermentation, total gas, methane production and invitro digestion of dry matter, organic matter and metabolizable energy. Tables 1 and 2 show the chemical composition of concentrates and alfalfa hay.

**Table 1: The chemical composition of the ingredient used in the from ……utilization experimental of the diet %.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>DM %</th>
<th>OM%</th>
<th>Ash%</th>
<th>CP%</th>
<th>CF%</th>
<th>EE%</th>
<th>NFE %</th>
<th>ME* (MJ/Kg DM)</th>
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<td>Barley</td>
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<td>86.01</td>
<td>4.44</td>
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<td>2.09</td>
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<td>4.87</td>
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<td>83.56</td>
<td>4.91</td>
<td>43.84</td>
<td>6.52</td>
<td>2.25</td>
<td>30.95</td>
<td>10.61</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>91.22</td>
<td>85.59</td>
<td>5.63</td>
<td>17.15</td>
<td>11.93</td>
<td>4.53</td>
<td>51.98</td>
<td>11.33</td>
</tr>
<tr>
<td>alfalfa hay</td>
<td>90.58</td>
<td>80.02</td>
<td>10.56</td>
<td>14.28</td>
<td>18.04</td>
<td>1.92</td>
<td>45.78</td>
<td>9.62</td>
</tr>
</tbody>
</table>

NFE=[12]×0.014 + CF × 0.005 + EE × + 0.031 CP×* ME(MJ/Kg DM)=0.012

**Table 2: The Chemical composition and metabolizable energy (MJ/kg ……DM) of the treated diets

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Items</th>
<th>DM %</th>
<th>OM%</th>
<th>Ash%</th>
<th>CP%</th>
<th>CF%</th>
<th>EE%</th>
<th>NFE %</th>
<th>ME* (MJ/Kg DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>92.94</td>
<td>82.81</td>
<td>10.13</td>
<td>12.37</td>
<td>20.56</td>
<td>1.65</td>
<td>48.23</td>
<td>9.78</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>91.12</td>
<td>81.65</td>
<td>9.47</td>
<td>11.06</td>
<td>19.41</td>
<td>1.81</td>
<td>49.37</td>
<td>9.76</td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>92.15</td>
<td>82.71</td>
<td>9.44</td>
<td>11.31</td>
<td>20.02</td>
<td>1.22</td>
<td>50.16</td>
<td>9.74</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>91.16</td>
<td>81.58</td>
<td>9.58</td>
<td>10.25</td>
<td>20.10</td>
<td>1.62</td>
<td>49.61</td>
<td>9.68</td>
<td></td>
</tr>
</tbody>
</table>

T1:control(Without adding), T2:diyet adding peppermint oil 70 μl/kg dry matter, T3:diyet adding peppermint oil 140 μl/kg dry matter, T4:diyet adding peppermint oil 280 μl/kg dry matter,** indicates significant differences at the probability level (P <0.01).

**Estimation of total gas and methane production in the laboratory:** The total gas production in the laboratory was estimated by taking 4 replicates per sample according to method. 200 mg of experimental feed was weighed and 20 ml of industrial saliva and 10 ml of filtered rumen were added. The syringe was closed with a plastic seal to prevent the fluid from flowing from the syringe at the incubation and then the injection was incubated in a water basin at 39 °C for periods 24, 48, 72 and 96 hours With Planck work for each period of incubation (4 replicates), then the injection was withdrawn to calculate the total gas production was added 4 ml of sodium hydroxide concentration of 4% to 2 samples only to calculate the production of methane gas by method. The metabolizable energy(ME) of the organic matter (IVOMD), the short-chain fatty acids (SCFA) and the net production of milk (NEL) of the total gas production were calculated (ME) After a period of 24 hours using the following equations:

ME (MJ/kgDM) = 1.06 + 0.157GV + 0.084CP + 0.22CF –0.081A(Ash)

By method (13)

IVOMD(%)= 14.88 +0.889 GV + 0.45CP +0.651 x A(ASH)

SCFA(mmol/Later) = 0.0239 GV – 0.061

By method
NEL (MJ/Kg DM)=0.096xGV +0.0038xCP+0.000173x EE²+0.54

By method\textsuperscript{10}

Whereas:

ME= metabolizable energy (MJ/kg dry matter)
GV= Total gas production (ML)
CP=Protein Fiber %
CF= Crude Fiber %
A=Ash %
SCFA= short-chain fatty acids (MMOL/L)
IVOMD= \textit{in vitro} the organic matter %
NEL= net production of milk (MJ/kg dry matter)

\textbf{Measuring in vitro digestion dry matter and organic matter coefficient:} Both were estimated \textit{in vitro} digestion dry matter and organic matter coefficient by method\textsuperscript{11}.

\textbf{Chemical analysis:} Samples were analyzed to determination dry matter, organic matter, ash, ether extract, crude protein, and crude fiber by method\textsuperscript{12}.

\textbf{Statistical analysis:} The data were analyzed statistically complete randomized design treatments means were separated using Duncan\textsuperscript{9}, multiple range test, level of probability using the\textsuperscript{10}.

\textbf{Results and Discussion}

\textbf{Estimation of total gas and methane production \textit{in vitro} (ml/200mg dry matter):} The results of Table 3 showed a significant decrease in the T3 treatment containing mint oil (28.12 and 30.24 mg/200 mg dry) in total gas production after 12 and 24 h. of \textit{in vitro} incubation and T2 and T4 treatments by 31.20, 26.55 and 33.22, 28.42 mL/200 mg dry matter, respectively, compared with control treatment T1 36.80 and 37.87 mg/200 mg dry matter, In the same context, after 48 and 72 h. of \textit{in vitro} incubation, there was a significant decrease(p<0.01) in the total gas production (p<0.01) in the T4 treatment, with an average of 31.50 and 32.05 ml/200 mg dry and T2 and T3 respectively at 35.92, 39.97 and 33.53,32.63 ml/200 mg dry matter, respectively, compared with T1 39.05 and 43.00 mg/200 mg dry matter, which is similar to that obtained\textsuperscript{13} This may be due to the fact that the addition of vegetable oils to feed The process of digestion of carbohydrates in the rumen, which had a clear effect on the reduction of the production and composition of gases in rumen.

For methane, after 12 and 24 hours of \textit{in vitro} incubation, the results showed a significant decrease (p<0.01) in T2 in methane production at 2.42 and 3.78 (ml/200 mg dry) followed by treatment T4 (2.42) And 2.70 mg/200 mg dry matter (finally treatment T3 2.42) and 3.25 mg/200 mg dry matter (respectively) compared with the treatment of T1 (3.55 and 3.77 mg/200 mg dry matter), while the volume of methane after 48 days of \textit{in vitro} incubation at treatment T3 (3.50 mg/200 mg dry) followed by treatment T4 (3.58 ml/200 mg dry matter) compared to T1 (4.20 mg/200 mg dry matter), whereas T4 (p<0.01) in the volume of methane after 72 h. of \textit{in vitro} incubation at 4.05 ml/200 mg dry matter compared to the treatment of T1 (4.62 ml/200 mg dry matter), These findings are consistent with the findings\textsuperscript{13} may be due to the addition of peppermint oil, which reduced the effectiveness of fermentation in the rumen by reducing the activity of microorganisms by encapsulating the feed material with a thin layer of oil, which reduced the susceptibility of microorganisms to adhesion to the material Fodder and secretion of digestive enzymes\textsuperscript{14}.

\textbf{Table 3: Effect of adding peppermint oil in total gas and methane production \textit{in vitro} (ml/200 mg dry matter)}

\begin{table}[h]
\begin{center}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline
\textbf{Studied} & \textbf{Total gas} & \textbf{Volume of} & \textbf{Total gas} & \textbf{Volume of} & \textbf{Total gas} & \textbf{Volume of} & \textbf{Total gas} & \textbf{Volume of} \\
\textbf{Characters} & \textbf{gas} & \textbf{methane} & \textbf{gas} & \textbf{methane} & \textbf{gas} & \textbf{methane} & \textbf{gas} & \textbf{methane} \\
\hline
\textbf{Incubation Periods (hr.)} & 12 & 24 & 48 & 72 & 12 & 24 & 48 & 72 \\
\hline
\textbf{T1} & & & & & & & & \\
36.80 ± 0.24 & 3.55 ± 0.04 & 37.87 ± 0.30 & 3.77 ± 0.08 & 39.05 ± 0.20 & 4.02 ± 0.40 & 43.00 ± 0.42 & 4.62 ± 0.07 \\
& a & a & a & a & a & a & a & a \\
31.20 ± 0.34 & 2.42 ± 0.04 & 33.22 ± 0.44 & 3.78 ± 0.17 & 35.92 ± 0.46 & 4.22 ± 0.17 & 39.97 ± 0.56 & 4.95 ± 0.13 \\
& b & c & B & a & a & a & a & a \\
28.12 ± 0.41 & 2.71 ± 0.09 & 30.24 ± 0.54 & 3.25 ± 0.13 & 33.53 ± 0.37 & 3.50 ± 0.04 & 32.63 ± 0.12 & 4.27 ± 0.04 \\
& c & b & C & b & c & b & c & c \\
26.55 ± 0.41 & 2.43 ± 0.15 & 28.42 ± 0.32 & 2.70 ± 0.40 & 31.50 ± 0.40 & 3.58 ± 0.13 & 32.05 ± 0.47 & 4.05 ± 0.06 \\
& d & c & D & c & b & b & b & b \\
\hline
\textbf{T4} & & & & & & & & \\
& & & & & & & & \\
\hline
\textbf{Significant} & ** & ** & ** & ** & ** & ** & ** & ** \\
\hline
\end{tabular}
\end{center}
\end{table}

This may be due to the fact that the addition of vegetable oils to feed The process of digestion of carbohydrates in the rumen, which had a clear effect on the reduction of the production and composition of gases in rumen.
T1: control (Without any addition), T2: diet adding peppermint oil 70 μl/kg dry matter, T3: diet adding peppermint oil 140 μl/kg dry matter, T4: diet adding peppermint oil 280 μl/kg dry matter, N.S indicates not significant ** indicates significant differences at the probability level (P < 0.01).

Measurement of *in vitro* digestion factor for dry matter, organic matter (%) and metabolizable energy (MJ/kg dry matter): The results in Table 4 showed significant differences (p<0.01) in the laboratory digestion of dry matter, organic matter, and metabolite energy by adding different levels of peppermint oil by 0, 70, 140 and 280 μl/kg dry matter, with T1, T2 and T3 (64.18, 63.41 and 62.31%, respectively). High perennial (p<0.01) in *in vitro* digestion of dry matter compared to T4 treatment (60.23%) with 280 μl/kg dry matter peppermint oil. These findings are not consistent with15, This may be due to the fact that the addition of vegetable oils to ruminant diets has given a positive indication of the increase in the *in vitro* digestion coefficient of the dry matter in the bush, there is a relationship between the addition of oil and the *in vitro* digestion coefficient of dry matter.

As for the effect of peppermint oil in the *in vitro* digestion of organic matter, the results (Table 4) showed a high elevation (p<0.01) in the T2 treatment containing (65.07%) compared to T4 (62.08%) while T3 was middle between them (63.31%). These results are not consistent with the findings of the study16. The addition of vegetable oil to alfalfa a hay had positive effect in improving the *in vitro* digestion factor of the organic matter, which gives a clear indication of the destruction of carbohydrates in rumen.

**Table 4: Effect of adding peppermint oil in *in vitro* digestion for dry matter, organic matter and metabolizable energy**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>IVDMD %</th>
<th>IVOMD %</th>
<th>ME (MJ/kg DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>64.18 ± 0.87 a</td>
<td>65.07 ± 0.73 a</td>
<td>9.62 ± 0.13 a</td>
</tr>
<tr>
<td>T2</td>
<td>63.41 ± 0.67 a</td>
<td>64.48 ± 0.66 a</td>
<td>9.51 ± 0.10 a</td>
</tr>
<tr>
<td>T3</td>
<td>62.31 ± 0.53 a</td>
<td>63.31 ± 0.43 ab</td>
<td>9.34 ± 0.08 a</td>
</tr>
<tr>
<td>T4</td>
<td>60.23 ± 0.30 b</td>
<td>62.08 ± 0.77 b</td>
<td>9.03 ± 0.04 b</td>
</tr>
</tbody>
</table>

The results of Table 4 showed a high elevation (p<0.01) in the metabolizing energy of T1, T2 and T3 containing 0, 70 and 140 μl/kg dry matter of peppermint oil, which reached 9.62, 9.51 and 9.34 MJ/kg dry matter, respectively, compared to T4 (9.03 MJ/kg dry matter), and these results are inconsistent with15, the reason may be that the addition of vegetable oil to the diet has had a positive effect on the improvement of metabolizable energy in forage (T2 and T3) with mint oil, but the high oil content of 280 μl/kg dry matter has caused a negative effect And the *in vitro* digestion factor for the dry matter, there is a direct relationship between the addition of the oil and the estimation of the energy of the feed.

**Conclusion**

Adding of peppermint oil to the ration diet has given better results in reducing the production of total and methane gas and led to a significant improvement in *in vitro* digestibility of dry matter, organic matter and of metabolizable energy.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

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MEBA: Development Android-based Ecosystem Module for Senior High School Students

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¹Biology Education Program, Faculty of Mathematics and Natural Science, Universitas Negeri Jakarta, Indonesia

ABSTRACT

The purpose of this study was to develop teaching materials in the form of an android-based module on the biology of ecosystem material for students. This research was conducted in February-May 2019 at Universitas Negeri Jakarta. This study used the Research and Development (R & D) method. The results of the study showed that the assessment was carried out by three experts namely media experts, material experts and linguists had very decent results. The percentage of the feasibility of Android-based biological ecosystem material module according to the media experts is 89%, according to the material at 85% and according to the experts at 83% which is categorized as very valid. Assessment of 30 students with a percentage of 80% classified as valid. The conclusion is that MEBA is valid and suitable for use in learning at school.

Keyword: Android-based, Research and Development, MEBA

Introduction

Technology is a whole means to provide goods needed for the survival and comfort of human life. One of the most widely used technologies is the use of smartphones¹⁴. Operating a smartphone requires a mobile operating system (OS). One of the most popular mobile operating systems (OS) today is Android. Android is relatively easy to develop because it is open to be studied, changed, improved and disseminated so that it can be made as needed ⁵⁻⁷.

Learning biology in the 21st century emphasizes students to be able to learn independently. Students must be active in learning and not make the teacher the only source of learning⁸⁻¹¹. Students must be able to be independent in learning activities. The independence of learning affects learning ability so that it can improve student learning outcomes. Of course, there must be a media to facilitate students to be independent. It is impossible for students to be independent without being trained or facilitated¹²,¹³.

Learning media that are considered suitable is one of them is an Android-based module.

Module development is in line with current technological developments. The module developed is a biology-based module on ecosystem material (MEBA) that is practical and has an attractive appearance. The module will also complete animation and video. Also, questions will also be included as evaluation material for students and the score can immediately appear. Students can also learn while playing with the games menu added. The novelty of this research is a module that has a glossary menu that contains biological terms that are relevant to the material and its definitions. Usually, the menu is not found in modules in general. Based on the description, it is necessary to develop the MEBA module. The purpose of this study was to develop MEBA for students in Biology learning.

Method

This research was conducted in February - May 2019 at the Jakarta State University. The research method used in this study is research and development with the design of Borg and Gall¹⁴. The stages in this design are collecting data, planning, developing, tryout prototype, a small group tryout, revise, a trial dissemination field. In the collecting data, stage consists of an analysis of needs and students and learning objectives. The second stage
is the planning stage which consists of the preparation of material and preparation of storyboards.

After all the designs are ready, developing is carried out to develop the biology module based on Android ecosystem material (MEBA) for Senior High School students. After the development stage is done, then the prototype tryout stage is validation to media experts, material experts, and linguists. The next stage is a small group tryout conducted on 10 students and a field trial stage for a whole class trial for 30 students. MEBA validation is done for media experts, material experts, linguists, and students. The media validation criteria refer to Akbar and can be seen in table 1 below.

Table 1: Validation Categories

<table>
<thead>
<tr>
<th>Score Percentage</th>
<th>Category</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 % - 100%</td>
<td>Very Valid</td>
<td>Can be used without repair</td>
</tr>
<tr>
<td>61 % - 80%</td>
<td>Valid</td>
<td>Can be used with a little improvement</td>
</tr>
<tr>
<td>41 % - 60%</td>
<td>Less Valid</td>
<td>Can be used with many improvements</td>
</tr>
<tr>
<td>21 % - 40%</td>
<td>Not Valid</td>
<td>Cannot be used</td>
</tr>
<tr>
<td>0% - 20%</td>
<td>Not Valid</td>
<td>Cannot be used</td>
</tr>
</tbody>
</table>

Source : Akbar (2013)

Result and Discussion

The Android-based biology module (MEBA) was developed in Indonesian Language and consists of 8 main sections including the start page, main menu page, competency indicator page, material page, evaluation page, quiz page, glossary page, and developer information page. The start page is the first display of MEBA which contains the module title and developer name along with the main menu as shown in Figure 1.

The next section on biology modules is based on Android, namely submenu of material and glossary. This menu is a novelty because there is usually a glossary. More details can be seen in figure 2 below.

Table 2: Results of Media Expert Validation

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display quality</td>
<td>80%</td>
<td>Valid</td>
</tr>
<tr>
<td>2</td>
<td>Software engineering</td>
<td>100%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>3</td>
<td>Implementation</td>
<td>100%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>4</td>
<td>Interface</td>
<td>85%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>5</td>
<td>reusable</td>
<td>80%</td>
<td>Valid</td>
</tr>
<tr>
<td>6</td>
<td>Maintainable</td>
<td>90%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>7</td>
<td>Compatibility</td>
<td>90%</td>
<td>Very Valid</td>
</tr>
<tr>
<td></td>
<td>Average Score</td>
<td>89%</td>
<td>Very Valid</td>
</tr>
</tbody>
</table>

Table 3: Results of Material Expert Validation

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>According to the curriculum</td>
<td>88%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>2</td>
<td>Material presentation</td>
<td>87%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>3</td>
<td>evaluation</td>
<td>80%</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Average Score</td>
<td>85%</td>
<td>Very Valid</td>
</tr>
</tbody>
</table>
Table 4: Results of Language Expert Validation

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Legibility</td>
<td>80%</td>
<td>Valid</td>
</tr>
<tr>
<td>2</td>
<td>Delivery of information</td>
<td>90%</td>
<td>Very Valid</td>
</tr>
<tr>
<td>3</td>
<td>Language rules</td>
<td>80%</td>
<td>Valid</td>
</tr>
<tr>
<td>4</td>
<td>Language effectiveness</td>
<td>80%</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td><strong>Average Score</strong></td>
<td><strong>83%</strong></td>
<td><strong>Very Valid</strong></td>
</tr>
</tbody>
</table>

Table 5: Result of Students from Small and Large Classes

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
<th>Media</th>
<th>Material</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small class</td>
<td>82%</td>
<td>78%</td>
<td>82%</td>
</tr>
<tr>
<td>2</td>
<td>Large class</td>
<td>79%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td><strong>Average Score</strong></td>
<td><strong>81%</strong></td>
<td><strong>79%</strong></td>
<td><strong>81%</strong></td>
</tr>
</tbody>
</table>

Based on the assessment of media experts as a whole the biology-based module android gets a percentage of 89% with very valid criteria. Based on the assessment of material experts as a whole the assessment gets a percentage of 85% with very valid criteria. Based on the assessment of linguists the percentage of the overall assessment gets a percentage of 83% with very valid criteria. Meanwhile, the results of validation to students showed a percentage of 81% in terms of the media, 79% for the material aspect, 81% in terms of language so that if averaged got 80% so that it could be categorized as appropriate for use in learning.

MEBA is an innovation in Biology learning in the 21st century. This is in line with technological advances that change the learning paradigm. Now learning doesn’t have to be in class and do face to face. The existence of technological advancements such as this makes teachers easier to deliver material. In addition, the material delivered can be modified by yourself. Just like MEBA that inserts a glossary menu.

This glossary menu is inserted in MEBA to make it easier for students to find scientific terms that are difficult to understand. This is because one of the obstacles for students in learning Biology is because many scientific terms are not familiar in everyday life. This glossary menu will help students find the term. This will also support student learning independence. When students experience difficulties, there is no need to ask the teacher about it.

Even so, the role of the teacher in this matter remains essential. MEBA can indeed help in learning, but that does not mean that biology teachers can just leave their duties. Teachers in the 21st century must still play a role in learning, but still learning remains student-centered. Teachers can continue to provide motivation to create a conducive learning atmosphere. Using MEBA in learning can make learning more active, provided the learning model used also supports students and can discuss.

MEBA aside from being used for students, it has benefits that can also be used by various groups such as undergraduate students or the general public. That is because the operation of MEBA is easy and simple. MEBA can be used on various types of Android devices. We know that the use of Android is very much in the world. Even though MEBA is easy to operate, there must be some modifications if you want to use it for the general public. MEBA has the potential to be further developed so that it can be more relevant to the general public. The community needs MEBA to be able to easily understand the environmental problems around it.

Conclusion

Based on the results of the study, it can be concluded that the MEBA module for class XI SMA is feasible and can be used in the learning process. The MEBA validation score from media experts was 89%, material experts 85%, linguists 83%. While students get a percentage of 80%. This shows that MEBA is an innovation in the learning of 21st-century Biology.

Acknowledgments

Thank you to the validators, media experts, and material experts who have been involved in this research. Thanks also to the Faculty of Mathematics and Natural Science, Universitas Negeri Jakarta for helping with funding from this research. Without support from various parties, this research will not work well.

Conflict of Interest: There is no conflict of interest in this research

Source of Funding: Faculty of Mathematics and Natural Science, Universitas Negeri Jakarta, Indonesia

Ethical Clearance: verbal approval was obtained from students and learning expert as participant in this study
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ABSTRACT

**Background:** Major surgical procedures lead to perioperative immunosuppression. This study aimed to evaluate the influence of Total intravenous anesthesia (TIVA) on the immune response of oncologic patients undergoing lower limb surgeries.

**Method:** The study included 18 patients with lower limb malignancies scheduled for lower limb-sparing surgery. They were planned to receive Total intravenous anesthesia (TIVA), (n=18). Pain intensity and levels of IL-6 and IL-10 were assessed postoperatively. If visual analogue scale (VAS) scores ≥ 4, a dose of morphine 2.5 mg IV was used.

**Results:** In the study group, IL-6 and IL-10 levels were measured at baseline and 24 hours after surgery. Both IL-6 and IL-10 levels increased 24 hours after surgery. Increase of IL-6 level was significantly higher than that of IL-10 (p < 0.001). The total morphine consumption in TIVA was 17.72 ± 1.32 mg.

**Conclusion:** Total intravenous anesthesia (TIVA) provides effective anesthesia but does not enhance the patients’ immune response by disturbing IL-6/IL-10 balance in patients undergoing surgery for lower limb malignancy.

**Keywords:** Total intravenous anesthesia, lower limb cancer, IL-6, IL-10, immune response.
inflammatory phase to prevent the excessive activation of the systemic inflammation, mainly through the release of IL-10. The balance between the proinflammatory and the anti-inflammatory cytokines limit the spread of infection, tissue injury and promote tissue healing and repair through their local and systemic effects. The number of liver resection has increased, which requires adequate and safe anesthesia provision in this surgery area. Cytokine plasma spectrum is the one of the most important indicators characterizing inflammatory reaction intensity during and after surgery and postoperative period flow prognosis. Immune monitoring gives a notion about operative room features, liver damage severity, anaesthesia adequacy. Interleukin dynamics evaluation during liver resections is a topical theoretical and practical problem. The aim of this research was to evaluate the interleukins intraoperative dynamics in liver resection patients. Anaesthesia protocols were analyzed in 51 patients, 26 (51%)

All forms of general anesthesia have been found to modify the immune system by affecting both innate and adaptive immunity. Presumably by directly affecting the immune system or activating the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system. Along with stress such as surgery, blood transfusion, hypothermia, hyperglycemia, and postoperative pain, anesthetics per se are associated with suppressed immunity during perioperative periods because every anesthetic has direct suppressive effects on cellular and neurohumoral immunity through influencing the functions of immunocompetent cells and inflammatory mediator gene expression and secretion. Particularly in cancer patients, immunosuppression attributable to anesthetics, such as the dysfunction of natural killer cells and lymphocytes, may accelerate the growth and metastases of residual malignant cells, thereby worsening prognoses. Alternatively, the anti-inflammatory effects of anesthetics may be beneficial in distinct situations involving ischemia and reperfusion injury or the systemic inflammatory response syndrome (SIRS). Different anesthetic approaches may modulate the stress response, particularly CK activation. Total intravenous anesthesia is found to inhibit the stress response; many studies showed that total intravenous anesthesia might preserve different immunologic indices better than general inhalational anesthesia.

Many studies have suggested that impairment of the immune response might increase perioperative morbidity and mortality in susceptible patients (e.g., all cancer patients) due to infection, recurrence, and metastasis of the malignant tumor. In oncological patients, the immune status is often impaired by the malignant disease itself and by chemotherapy when administered preoperatively and appears to be worsened as the disease progresses. In this study, we investigated cell-mediated immune status in colorectal cancer patients.

METHOD: Interleukin-2 (IL-2)

This study aimed to evaluate the influence of total intravenous anesthesia (TIVA) on the immune response of oncologic patients undergoing lower limb surgeries for malignancies.

Patients and Method

This study was carried out at National Cancer Institute (NCI), Cairo University. The study was approved by the local anesthesia department scientific and ethical committee (Approval no. MD2010014043.3). All patients were informed about the study design and objectives as well as tools and technique. Every patient provided informed written consent before enrollment in the study.

Inclusion criteria were patients between 20 and 60 years old with lower limb malignancies with no evidence of distant metastasis scheduled for lower limb-sparing surgery not exceeding two hours. Exclusion criteria included hepatic and renal impairment, diabetes mellitus or other endocrine disorders, obesity (BMI >30 kg/m²), immune disorders or immunosuppressive therapy, steroid treatment in the last six months, bronchial asthma, coagulopathy and cardiac diseases. Eighteen patients were planned to receive total intravenous anesthesia.

Method: The routine preoperative assessment was done to all patients. In the operating room, patients were monitored continuously using ASA standard monitoring (ECG, pulse-oximetry, SaO₂, non-invasive blood pressure and capnography). Blood loss was observed every 5 min. An intravenous (IV) access was established with 16-18 G cannula. Preoperative antibiotic prophylaxis, paracetamol 1 gm IV infusion and 30 mg ketorolac intramuscular were given to all patients. All patients received 0.02 mg/kg midazolam intravenously and 100% O₂ via face mask (3-4 L/min) for 3 minutes. Intravenous Ringer’s lactate solution was administered to replace fluid deficit preoperatively. resuscitation equipment and drugs were available.
Anesthesia was induced with propofol 2 mg/kg, fentanyl 2 μg/kg and rocuronium 0.6 mg/kg for tracheal intubation. Anesthesia was maintained with continuous infusion of propofol 3-6 mg/kg/hr, fentanyl 1.5-2.5 μg/kg/hr and rocuronium 0.15 mg/kg/hr. Fentanyl was administrated in increments 0.5 μg/kg guided by hemodynamic and clinical requirements (if more than 20% of standard heart rate and blood pressure).

For postoperative analgesia, all patients received ketorolac 30 mg/12 hrs and IV paracetamol (15 mg/kg) every 8 hours. In case of pain with visual analogue score (VAS) ≥ 4 a dose of morphine 2.5 mg IV was used.

In the two groups, the pain intensity was assessed using VAS score immediately postoperative and at 1, 2, 6, 12 and 24h postoperative. The total morphine consumption was calculated. For patients and surgeons satisfaction assessment, the following rating scale was reported preoperatively and at 24 hrs postoperative: 1 poor, 2 fair, 3 good, 4 very good and 5 excellent.15

Two venous samples were collected from each patient in plain tubes: prior to anesthesia induction (once intravenous cannula was inserted) (T0) and 24 hours postoperative (T24) Laboratory assay of IL-6 and IL-10 procedure followed the basic principle of sandwich ELISA technique. Commercial kits were supplied by Assaypro, USA (EI1006-1) for IL-6 and (EI3010-1) for IL-10. ELISA technique was done using semi-automated ELISA system (TC 96, tecodiagnostics, Austin, Texas, USA).

The sample size was calculated based on the findings of Davies et al.16 that the estimated mean pain score was 55 in the TIVA group, with a standard deviation of around 15, at 24 hours post-surgery. The calculated the sample size with alpha 0.05 and power of 80% was 18 patients in TIVA group.

Statistical Method: Data management and analysis will be performed using the Statistical Package for Social Sciences (SPSS) vs. 21. Numerical data will be summarized using means and standard deviations or medians and ranges. Categorical data will be summarized as percentages. Comparison of numerical variables within the study group was made using t-test or Mann-Whitney test as appropriate. Comparison between categorical data was performed by the Chi-square or Fisher’s exact test. All tests were two-sided. A p-value < 0.05 was considered statistically significant.

Results

The demographic data is shown in Table 1. Table 2 shows that after 24 hours the two interleukins increased. However the increase of IL-6 level (p < 0.001) was significantly higher than that of IL-10 (p < 0.019).

Immediately in PACU, patients of TIVA Group started to experience pain with various degrees (Table 3). All patients of TIVA Group were in need of morphine rescue analgesia during the postoperative period. The total morphine consumption in the studied group was 17.72 ± 1.32 mg.

After Induction of anesthesia mean arterial pressure (MAP) increased significantly in the TIVA Group (p < 0.001) (Figure 1). After that, MAP started to regain the baseline values. Similar changes were recorded in heart rate (Figure 2). However, all readings were within the clinically accepted ranges.

Table 1: Demographic data of the studied subjects

<table>
<thead>
<tr>
<th>TIVA Group n = 18</th>
<th>Age (years)</th>
<th>43.89 ± 7.24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M/F)</td>
<td>8/10</td>
<td></td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>27.23 ± 2.6</td>
<td></td>
</tr>
<tr>
<td>ASA Class (I/II)</td>
<td>8/10</td>
<td></td>
</tr>
</tbody>
</table>

Data are presented as mean ± SD or number of patients

Table 2: Levels of interleukins in the TIVA group before induction of anesthesia and 24 hours postoperatively

<table>
<thead>
<tr>
<th>TIVA Group n = 18</th>
<th>Interleukin-6 (pg/mL) Before Induction Mean ± SD 11.1 ± 2.9 Range 7.3-17.3 Postoperative Mean ± SD 47.8 ± 10.9 Range 42.8-55.3 p value* &lt; 0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interleukin-10 (pg/mL) Before Induction Mean ± SD 10.4 ± 2.6 Range 7.2-14.6 Postoperative Mean ± SD 15.1 ± 9.02 Range 7.6-45.5 p value* 0.019</td>
</tr>
</tbody>
</table>

*p<0.05 is considered statistically significant. *P<0.001 is considered statistically highly significant.
Table 3: VAS pain scores in the studied group during the postoperative period

<table>
<thead>
<tr>
<th></th>
<th>TIVA Group n = 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>In PACU</td>
<td>4.5(4-5)</td>
</tr>
<tr>
<td>After 1 hr</td>
<td>3(2-4)</td>
</tr>
<tr>
<td>After 2 hr</td>
<td>3(2-3)</td>
</tr>
<tr>
<td>After 6 hr</td>
<td>4.5(4-5)</td>
</tr>
<tr>
<td>After 12 hr</td>
<td>4.5(4-5)</td>
</tr>
<tr>
<td>After 24 hr</td>
<td>4(4-5)</td>
</tr>
</tbody>
</table>

Data are presented as median (range)

Figure 1: Heart rate (beat/min) in the studied group in pre-determined time intervals

Figure 2: Mean arterial blood pressure (mmHg) in the studied group in pre-determined time intervals

Discussion

The results of this study demonstrated that IL-6 increased in the study group 24 hours after surgery; the levels of IL-6 increased almost 4-fold after surgery in TIVA Group (highly significant). On the other hand, IL-10 increase was less marked. Therefore, total intravenous anesthesia not maintaining the immunological balance between IL-6 and IL-10.

It was demonstrated that the immune response to surgical trauma begins with the release of proinflammatory CKs; the acute phase response mediated mainly by IL-6. Then, this response is balanced by an anti-inflammatory phase to prevent the excessive activation of the systemic inflammation. The most important anti-inflammatory CK is IL-10.

Previous studies suggested that total intravenous anesthesia can attenuate the patients’ anesthetic and surgical stress compared to general inhalational anesthesia.

Moselli et al. demonstrated the immunological superiority of regional anesthesia compared to general anesthesia in patients undergoing major surgery for colon cancer. In their series, Epidural anesthesia (as a type of regional anesthesia) attenuates the IL-6 production...
and the surgery-induced proinflammatory response, while the levels of IL-4 and IL-10 were significantly elevated. Similar findings were reported in comparing spinal anesthesia and intravenous anesthesia.\(^{19}\) Also, preemptive epidural analgesia limited the pro-inflammatory response to surgery in women undergoing elective laparoscopic radical hysterectomy for cervical cancer.\(^{20}\) In patients undergoing primary total knee arthroplasty, a combination of continuous lumbar plexus and sciatic nerve blocks was associated with attenuated postoperative inflammatory response.\(^{21}\) and then were randomly allocated to either patient-controlled analgesia with morphine (n = 6). Also, Davies et al. used Epidural anesthesia and CFSBs as perioperative analgesia for knee arthroplasty. Total morphine consumption was lower in CFSBs group.\(^{16}\)

Wiryana et al. reported that regional anaesthesia (combined spinal epidural technique) had a superior effect of reducing inflammatory response compared to TIVA by suppressing level of IL6.\(^{22}\) In detecting the inflammatory cytokine expression levels in peripheral blood of patients with cervical discogenic pain before and after cervical nerve block, Bai-shan et al. found that peripheral blood inflammatory cytokines TNF-α, IL-1, IL-6 levels decreased at 24 hours and three days after cervical nerve block therapy compared with before nerve block.\(^{23}\)

These effects appear to transient and may be of minor importance in subjects with a healthy immune system. However, in patients with immune dysfunction, multiple organ failure, or other high-risk groups as cancer patients, the influence of anesthetics on the perioperative inflammatory response may have clinical implications.\(^{1}\)

In the current study, we evaluated one type of general anesthesia; total intravenous anesthesia (TIVA). We proposed that (TIVA) may enhance the patient’s immune response by achieving a balance between the proinflammatory and anti-inflammatory CKs; IL-6 and IL-10. This expectation was based on possible good patients’ comfort, good extended postoperative analgesia, low morphine consumption, and good attenuation of neuroendocrinal stress response.\(^{30}\) Similarly, Fekkes et al. suggested that propofol does not inhibit IL-6 release and that longer operating times are paired with increased IL-6 production.\(^{31}\)

Concerning the VAS score at PACU, it was significantly higher at all recorded times in comparison to baseline (P<0.001). That may be due to short duration of action of last dose fentanyl (first dose morphine was required at PACU).

Therefore, the 24 hrs morphine consumption postoperative was high in the study group. The 18 patients in the TIVA Group needed morphine as post operative rescue analgesia when VAS score ≥ 4.

In conclusion, total intravenous anesthesia (TIVA) provide effective anesthesia in patients undergoing surgery for lower limb malignancy. This technique does not enhance the patients’ immune response by disturbing the balance between the proinflammatory cytokine IL-6 and the anti-inflammatory cytokine IL-10. However, it is characterized by hemodynamic stability, high surgeon and patient satisfaction, and low complications rate. Therefore, total intravenous anesthesia (TIVA) is not to be a preferred anesthetic alternative for lower limb surgeries in patients with malignancies or multiple medical co-morbidities.

**Ethical Clearance:** Taken from Egyptian National Cancer Institute Ethical Committee.

**Source of Funding:** Self-funding

**Conflict of Interest:** Nil

**REFERENCES**


Surgically Managed Isolated Midgut Malrotation–A Clinical Study of 34 Children

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ABSTRACT

Malrotation is the most common congenital malformation of the small intestine. A prospective study conducted at Alkarama teaching hospital, during January 2017 to December 2018, including 34 children (20 males and 14 females) less than 15 years old who were undergoing a Ladd procedure with a diagnosis of isolated intestinal malrotation confirmed by surgery; cases complicated by volvulus were excluded. Patients were followed up and evaluated prospectively. Findings revealed that the median age was 15 days. About 91% of cases aged less than five years. Almost 70.5%, of them at their first month of life. Classical presentations were mainly found in cases at their first year of life, while a typical presentations were reported in older children. The main and sufficient diagnostic tool for malrotation was the upper gastro-intestinal contrasts studies, it was sufficiently diagnostic in 50% of cases. Postoperative complications reported in 7 cases and unfortunately, 3 cases (8.8%) died of septicemia. In conclusion, The Ladds’ a significant efficient procedure with low mortality and morbidity rates in treatment of children with midgut malrotation.

Keyword: Midgut-malrotations, diagnostic tools, treatment, surgery, complications

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Introduction

Malrotation is the most common congenital malformation of the small intestine. It is estimated that 1 in 200 live births has an asymptomatic rotational deviation; however, symptomatic malformation occurs less frequently (1 in 6,000 live births) 1-3.

There are several attempts to provide the desired classification based on the etiology, but the incomplete turn indicates a failure that occurs at the final 180 degrees anti clockwise rotation or a reversal of the colon. No rotation occurs when the spin is rotated to the abdominal cavity without turning more than 90 degrees, that is, without turning back from the horizontal surface. Reverse rotation occurs when the post-arterial or caudal portion of the mid-gut or returns to the abdomen from the beginning, not before the pre-arterial part1,2,4.

Symptoms of malrotation and volvulus may include vomiting, flexion of the legs to the abdomen, abdominal pain, inflammatory bowel disease, diarrhea, constipation, rectal bleeding, weight loss, tachycardia, restless breathing. Symptoms of malrotation and volvulus may be similar to other medical conditions 4,5. The diagnostic methods for malrotation and volvulus may include in addition to the physical examination and medical-history, various studies of imaging and laboratory tests 1,6. These are done to evaluate the position of the malrotation and if they are bent or blocked. These tests include blood tests for electrolytes, a test for diagnosis of blood in the stool, plain x-ray, FAST ultrasound and Doppler, computed tomography (CT). Sometimes the diagnostic combined radiological studies used to get better imaging, for instance X-ray and CT scanning to get horizontal and axial views. CT scans accurate images of body parts, including bone, muscle, fat tissue, and limbs. CT scan is more accurate than general radiography, moreover, esophagograh and high GI series 2,6-8. Barium enema x-ray may shows an abnormal small intestine, blockage, and other problems2,7. The high GI series usually examines the small intestine, while lower GI series studying the large intestine. Barium enema performed for intestinal examination to detect abnormalities. Bariums enema X-ray may indicates that the large intestine is not in the normal place2,7. The flexible sigmoidoscopy, usually performed for volvulus, examines
the lower part of the digestive tract, the rectum and the large intestine. This can be used to detect volvulus. However, sometimes the diagnosis is difficult to differentiated in asymptomatic patients.\textsuperscript{9,10}

Malrotation is potentially fatal with the progression of intestinal ischemia. Early surgical intervention is essential and is often a life-saving. Symptomatic malformation often occurs in the first weeks of life.\textsuperscript{1,4} Therefore, to focusing on the surgical care of intestinal malrotation, this study emphasizes presentation, clinical and surgical management, review operative technique, and outcome of the surgery.

**Patients and Method**

This was a prospective study of isolated malrotation conducte in Alkarama teaching hospital, between January 2017 to December 2018. Included 34 patients with age range between 3 days and 14 years; who were presented with various signs suggestive of malrotation, those patients underwent physical examination, radiological study which included plain abdominal x-ray abdominal sonography (FAST US in some cases was performed and others with Doppler US), upper gastrointestinal contrast study, barium enema and CT scan, the finding were compared with result of surgical exploration. After rapid intravenous hydration, broad spectrum antibiotics that administered prophylactically. The Ladd procedure was performed to all patients. Patients were followed up from the first postoperative day to up to 5 months after surgery.

**Findings**

A total of 34 patients were enrolled in this study with a median age of 15 days. They were 20 males (58.8%) and 14 females (41.2%) with a male to female ratio of almost 1.4 to 1. Out of the 34 cases, 32 (94.1%) were full term on labor and only two (5.9%) were preterm, additionally, all patients with normal birth weight except one (2.9%) had low birth weight of 2.1 kg, (Table 1). The Clinical features at presentation of the studied group are summarized in (Table 2). Regarding the radiological studies, all patients examined with plain abdominal X-ray. Doppler ultrasonography performed in 15 cases (44.1%), focused abdominal sonography in trauma (FAST) in 8 cases (23.3%), upper gastrointestinal (UGI) contrast study in 8 cases (23.5%), barium enema in 2 (5.9%) and computed tomography scanning in 3 cases (8.8%), it is worth mentioned that in some patients more than one radiological study was performed, (Table 3).

The operative procedure performed was Emergency laparotomy in 11 cases (32.4%) and Elective laparotomy in 23 (67.6%), (Table 3). The overall postoperative complications reported in 14 cases (41.2%), (Figure 1), these included Adhesive intestinal obstruction, wound infection and septicemia in a rate of (20.6%), (11.8%) and 8.8%, respectively, (Table 4). Unfortunately, 3 patients did not survived giving a mortality rate of (8.8%), (Figure 2).

**Table 1: Age and sex distribution of the studied group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 7 days</td>
<td>9</td>
<td>26.5</td>
</tr>
<tr>
<td>7 days-29 day</td>
<td>15</td>
<td>44.1</td>
</tr>
<tr>
<td>1 month-1 year</td>
<td>4</td>
<td>11.8</td>
</tr>
<tr>
<td>13 months-5 years</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>Median</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>3 days-14 years</td>
<td>-</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
<td>58.8</td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>41.2</td>
</tr>
<tr>
<td>Male to female ratio; 1:4:1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gestational age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>32</td>
<td>94.1</td>
</tr>
<tr>
<td>Preterm</td>
<td>2</td>
<td>5.9</td>
</tr>
<tr>
<td>Birth weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>33</td>
<td>97.1</td>
</tr>
<tr>
<td>Low birth weight</td>
<td>1</td>
<td>2.9</td>
</tr>
</tbody>
</table>

**Table 2: Clinical features of the studied group**

<table>
<thead>
<tr>
<th>Clinical features</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilious vomiting</td>
<td>34</td>
<td>100.0</td>
</tr>
<tr>
<td>Abdominal distension</td>
<td>21</td>
<td>61.8</td>
</tr>
<tr>
<td>Fever</td>
<td>17</td>
<td>50.0</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>14</td>
<td>41.2</td>
</tr>
<tr>
<td>Dehydration and/or shock</td>
<td>13</td>
<td>38.2</td>
</tr>
<tr>
<td>Delay passage of meconium</td>
<td>3</td>
<td>8.8</td>
</tr>
</tbody>
</table>

**Table 3: Radiological studies and procedures performed among the studied group**

<table>
<thead>
<tr>
<th>Radiological studies</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Ray</td>
<td>34</td>
<td>100.0</td>
</tr>
<tr>
<td>Doppler US</td>
<td>15</td>
<td>44.1</td>
</tr>
<tr>
<td>FAST US</td>
<td>8</td>
<td>23.5</td>
</tr>
<tr>
<td>UGI contrast study</td>
<td>8</td>
<td>23.5</td>
</tr>
<tr>
<td>B. enema</td>
<td>2</td>
<td>5.9</td>
</tr>
<tr>
<td>CT scanning</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>Procedure performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency laparotomy</td>
<td>11</td>
<td>32.4</td>
</tr>
<tr>
<td>Elective laparotomy</td>
<td>23</td>
<td>67.6</td>
</tr>
</tbody>
</table>
Our finding revealed twenty boys (58.58%) against fourteen girls (41.2%) which agreed that reported previously as males are relatively more affected than females. While other earlier study found equal sex distribution.

Malrotation can present as an acute surgical emergency or with more chronic abdominal symptoms. In most of the reported cases, the most frequent symptom is vomiting (cyclic vomiting); However, the clinical characteristics in neonates cannot be easily distinguished from those of duodenal stenosis with vomiting of mood and laryngeal contraction that can be resolved after vomiting or aspiration by the infertile gastric tube. Pain or irritability is not a prominent clinical feature in babies, but a common feature in young and older children. Similar findings reported and comparable to that of Strouse et al. Images are essential to eliminate disability as a cause of vomiting. Abdominal pain is less frequent, (41.2%) compared to (55%) reported in literature and usually occurs in older patients.

The chronic presentation is a diagnostic challenge, which was seen in our study in patients above five years, nonetheless, the diagnostic delay is not uncommon, and the symptoms may found for almost 30 years. The chronicity of symptoms could be attributed to the compression effect of the peritoneal bands. The images of a child in our study are suspicious of starting a mal-rotation with an x-ray. The simple abdominal radiography are often normal or non-suggestive in most of our patients as same as result in the study done by Strouse et al, but occasionally the findings can be very confusing, may show double bubble sign, duodenum dilated with a fluid level, and scariness of gas in the distal bowel as reported by this study in (11%) of our patients, compared to (47.5%) found by Ameh EA et al.

The status and association between the superior mesenteric artery and Doppler ultrasound is a characteristic and may be useful in the diagnosis, which done in fifteen (44%) of our patients and suggested in only four (3.5%) of them. Although the contrast study of the upper gastrointestinal tract, is the first option investigation, the choice for each child with IM presented with bilious vomiting should be made immediately, except in cases where the baby is very sick or suspected of having a presence of infarction of the bowel and perforation risk is found, as in some of our patient, this investigation was not feasible for all our patients as it requires appointment and not available as an emergency study in the policy.

Discussion

The majority of patients (70.5%) in this study presented at their neonatal period. This is in line with the report of Mary and her colleagues (75%) but it can presented at any age.
of our hospital. Barium enema was performed in 2 cases (5.9%) of our patients, abnormal cecal position suggested in both. Prasil et al. found that normally positioned cecum in almost 20% of malrotation cases. Ladd’s represented the optimal surgical intervention for all malrotation cases. In our study were (32.3%) with elective laparotomy while (67.7%) had an emergency laparotomy. A laparotomy is performed soon after correction of dehydration, general condition of patients. In a study by Feitz R. et al. reported (23%) with elective Ladd’s procedure, while (74.5%) patients as an emergency procedure. Mortality and morbidity due to malrotation is often attributed to septicemia and adhesions of the bowel. The mortality rate during the operation in this study was due to septicemia (8.8%). In our environment, diseases and mortality are combined with delays and referrals. These problems can be addressed by educating parents, traditional birth-attendants, midwives, general practitioners and pediatricians about the need to suspect mal-rotation in any child with bilious-vomiting and early referral. Tashjian and others recommend that they examine a Ladd’s approach in asymptomatic patients after optimizing their cardiac function which agreed our study. The steps of the Ladd’s method, which was performed in all our patients, increased the handling and manipulation of the intestine and increased the risk of adherence, which, as postoperative complications in 7 patients (20.6%) of patients in our study compared to 10% reported by Mary et al. (5), (14%), (4%) by Strouse et al and (7-15%) rates of postoperative adhesions in previous reports. In this study (11.8%) of patients developed wound infection, of them two with dehiscence, while 8.8% had sepsis. In a study reported by Feitz et al. postoperative complications were wound infections (2.3%) including dehiscence (0.9%), sepsis (1.7%) of all patients.

The length of hospital stay in our study ranged (7-10 days) after the operation compared to (5-7 days) reported by Mary and colleagues, hospitalization duration may depend on different factors such as patient’s general condition and the need for further investigation. Unfortunately, we reported a mortality rate of 8.8%, however, in previous studies, malrotation mortality, ranged 6.9% as reported by Ademuyiwa et al. to 50% as that reported in in Nigeria.

**Conclusion**

Ladd’s procedure remain the surgical treatment of choice in midgut malrotation. With low postoperative complications, morbidity and mortality, which were reported comparable to previous studies. Early presentation, stabilized general condition and covered patient by broad spectrum antibiotics play an important role in reduction of the high morbidity and mortality. A properly performed and interpreted Doppler US and UGI series are the fastest, most accurate method of making the diagnosis.

**Ethical Clearance:** All ethical issues related to this research was approved from the local committee of the ethical issues of researches. Informed consents were obtained from the parents/guards of children before enrollment in the study. Data were collected in accordance with World Medical Association (WMA) declaration of Helsinki.

**Conflict of Interest:** Authors declared none

**Source of Funding:** Self-funded by authors

**REFERENCES**


The Effect of Anaerobic Exercises According to the Distance Traveled in the Game in Reducing the Concentration of Lactate and Improve the Performance of Some Skills for Table Tennis Players

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ABSTRACT

Through the exercise of table tennis students and their follow-up in training and games as well as their knowledge of the various curricula in the training of table tennis found that there is a lack of anaerobic exercise, according to the distance of the game during the game, which affects the concentration of lactic acid, which contributes to the development of performance of table tennis players, The main problems in the training of players because we know through the distance can put the appropriate exercises contribute to improve the performance of some skills during the game so researchers found it necessary to study this problem and develop appropriate solutions through The aim of the study was to prepare anaerobic exercises according to the distance spent during the match (10-12 years), and to determine the effect of anaerobic exercise on the development of lactic acid concentration and the skills of the upper frontal and rear impact injuries and movements of the two men. Functional and Technical tests the vertical jump test (Sargent) is used to measure anaerobic capacity, measure the concentration of lactic acid in the blood, measure the distance between table tennis and table tennis skills. The researchers concluded that exercise the Anaerobic System has increased the speed of the nervous system to adapt to the high training loads and its resistance to fatigue and improved its ability to quickly receive stimuli and make quick decisions, which was clear from the speed of the performance of players, and the exercise of speed increased the capabilities of players and their capabilities of the endurance of anaerobic muscles and the speed of disposal of acid And the high frequency and repetitive training method had a clear effect on biochemical adaptations due to rotation of work and rest periods.

Keywords: Anaerobic exercises, lactic concentration, basic skills and table tennis.

Introduction

The importance of research into the distance the table tennis player during the game to put the appropriate anaerobic exercises to reduce the concentration of lactic acid, which develops the performance of the table tennis player during the game, and the problem of research through the exercise of researchers to the game of table tennis and follow them in training and games and the multiple approaches to table tennis training have found that there is a lack of anaerobic exercise in accordance with the distance involved in the game, which affects the concentration of lactic acid, which contributes to improving the performance of table tennis players, we found that it is necessary to study this problem and to develop appropriate solutions through this study. The objectives of the research were to prepare anaerobic exercises according to the distance spent during the match. (10-12 years), and the impact of anaerobic exercise on the development of lactic acid concentration and stroke skills in the upper, frontal, posterior, and male movements.¹

Practical Part

Field Research Procedures: The researchers used the experimental method for the suitability and nature of the research on the students of the special school of table
tennis for the province of Karbala in a comprehensive manner. They are (12) children aged 10-12 years and divided the society by successive lots without returning to control and experimental groups and in each group (6) The homogeneity and equivalence processes were performed to ensure homogeneity of the sample of the study using the torsion coefficient and to show that the subjects were homogeneous in weight, age and length variables.

**Determination of measurements, functional tests and technical tests:** After examining the many measurements and tests and the experience of the researchers in this field, the measurements that proved their scientific weight in measuring the research variables were determined as measurements and tests in previous experiments, which can be measured and measured in the measurement of the skill and functional abilities of table tennis players.

**Characterization of tests:**

**First, Functional Test:** vertical jump test (modified Sergent):²

**Objective of the test:** measurement of anaerobic capacity.

**Description of the Performance:** The laboratory does some exercises for the purpose of warm-up before the start of the test for the purpose of configuration and pleasing, the laboratory holds a piece of crayons and then stand by the wall so that the scorpions are adjacent and the position stretched out and the legs are separated and the laboratory extends the arm near the wall to extend it as high as possible To mark the wall before jumping up to determine the level of jump from this signal and after the performance of the player weighted arms down and backward with the bend of the trunk to the front and down and bend the knees to the status of the list is jumping high to reach the maximum height, Chalk on the wall.

**Registration:** The laboratory is given three consecutive attempts to calculate the best results for the nearest (1 cm). The anaerobic capacity is calculated by the following equation:

\[
\text{Anaerobic capacity} = 2.21 \times \text{body weight} \times \sqrt{\text{Jump distance}}.
\]

**Second:** Testing and Functional Measurement: Measuring the concentration of lactic acid in the blood:³

**Objective of the test:** To know the level of concentration of lactic acid in the blood after the effort.

**Tools Used:** Lactate pro 2 manufactured by Arakray of Japan, two needle drill, 2 test strips, medical cotton, sterile materials, and small hand towel (2), registration form.

**Performance description:** After the laboratory has finished performing the speed-bearing test (180 m), performed as quickly as possible, the level of lactic acid concentration in the blood is measured after the effort, after the completion of the test time (5) minutes, Transmission of lactic acid from muscle to blood, followed by following steps for testing:

1. Configure the device to operate by turning it on from the power button and then placing the Test Strip and inserting it into the device.
2. After the blood is out of the finger, a drop of blood is placed on the measuring tape fixed on the device.
3. The device will show a sound after the device will start counting down from (15 seconds) until the result of measurement on the screen of the device in the unit of measurement is (Milli M/L).

**Recording:** The reading recorded by the device is recorded in milli/l.

**Third:** Measuring the distance of the table tennis match:⁴

Several physical games were played with a table tennis game for the respective sample of two speed cameras. Camera 1 was placed on one side at a distance of 4.10 meters from the side scale and at an altitude of 1.1 meters. A camera (2) was placed on the parallel scale of the parallel table (4 m) and the distance between the two lateral scales shall be (4 m) and the rear gauge shall be removed from the rear edge of the table (4 m). And painted clear marks on the ground and a metric scale in the confined area and the video was transferred to the computer to analyze these games by software (Tracker-4.96)

**Fourth:** Testing the skills of table tennis:

**Name of the test:** Test the skill of the frontal blow and the rear strike and the movements of the two men.

**The purpose of the test:** To determine the degree of performance and success of the skill of the frontal strike and rear strike and movements of the two men.

**Tools:** legal play table, legal rackets, legal balls, basket for collecting balls, registration form.
Description of the test: The player stands in the area of the back strike and stands the coach or the person who threw the balls in the Qatari counterpart and put a set of balls next to him and throw (10) balls at appropriate speeds in specific places on the table and hit the above skills with the movements of the two men towards it and three attempts each player and take the arithmetic mean each attempt includes (10) balls.

Pre-test: The researchers carried out the pretest after all the conditions were available for the period from 3/4/2017 corresponding to Friday and Saturday at 9:00 am.

Posttest: The researchers conducted Posttests of the research sample on Thursday and Friday, 13-14/4/2017 at 9 am after the end of the period of anaerobic exercises and the same method of pre testing.

Results and Discussion

Table 1: Shows the results of the pre and Post measurements of the control group in the measurement of lactic concentration and skill performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Pretest Mean</th>
<th>Pretest SD</th>
<th>Posttest Mean</th>
<th>Posttest SD</th>
<th>Level of significance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactate concentration in the blood</td>
<td>MI/L</td>
<td>18.23</td>
<td>1.175</td>
<td>17.25</td>
<td>1.531</td>
<td>0.014</td>
<td>Sig.</td>
</tr>
<tr>
<td>Backhand Blow - Two Foot Moves in One Step - Top Rotation in Front Face (10 balls)</td>
<td>Degree</td>
<td>6.17</td>
<td>2.14</td>
<td>8</td>
<td>1.788</td>
<td>0.002</td>
<td>Sig.</td>
</tr>
<tr>
<td>Blow in the back - Two feet with a jump - a higher turn in the front face (10 balls)</td>
<td>Degree</td>
<td>7.33</td>
<td>1.86</td>
<td>8.17</td>
<td>2.02</td>
<td>0.004</td>
<td>Sig.</td>
</tr>
<tr>
<td>Blow in the rear face - two feet rotation in half rotation - higher rotation in the front face (10 balls)</td>
<td>Degree</td>
<td>6.27</td>
<td>2.23</td>
<td>7.5</td>
<td>2.07</td>
<td>0.001</td>
<td>Sig.</td>
</tr>
<tr>
<td>Two-legged rotation - higher rotation in the front face - two cross-legged motion - higher frontal rotation (10 balls)</td>
<td>Degree</td>
<td>5</td>
<td>0.894</td>
<td>6.17</td>
<td>0.752</td>
<td>0.001</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

At the level of moral significance ≤ (0.05) and the degree of freedom (5).

Given the specificity of the table tennis game, which depends on the fast and intermittent moves, which depend on training in the training methods of high intensity and repetition is one of the characteristics of anaerobic exercises, so most of the functional adaptations of table tennis players are heading towards these specifications, through the figures obtained from the previous measurements We see that there is a difference in their ratios is almost simple in most of them because the functional adaptations appear clearly in aerobic exercise more than anaerobic exercises, as aerobic exercise depends on the endurance and the severity without the stenosis and occur adaptations in the organs of palpation the researchers attribute the increase in lactic acid (LA) to the extreme effort of a table tennis player with its dependence on anaerobic glycosylation significantly in energy production, which is stored in muscle fibers, 5 Which is rapidly analyzed to provide the muscle needed energy in the rapid effort and for a few periods. The differences were significant between the pre-test and post-control group, which decreased the concentration of lactic acid but very few levels as we observed differences in the circles It should be noted that the percentage of concentrations of this acid increases in the activities that depend on exercise and anaerobic performance as the main source of energy during the maximum effort, noting that “in working muscles, the effect of increased operations Metabolism is localized changes in pH and intracellular fluid components”6.
Table 2: Shows the results of the pre and Post measurements of the experimental group in the measurement of lactic concentration and skill performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Level of significance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactate concentration in the blood</td>
<td>MI/L</td>
<td>Mean 18.9 SD 3.197</td>
<td>Mean 16.8 SD 2.256</td>
<td>0.009</td>
<td>Sig.</td>
</tr>
<tr>
<td>Backhand Blow - Two Foot Moves in One Step - Top Rotation in Front Face</td>
<td>Degree</td>
<td>7.2 1.72</td>
<td>11 1.41</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Blow in the back - Two feet with a jump - a higher turn in the front face</td>
<td>Degree</td>
<td>6.83 1.72</td>
<td>9 1.79</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Blow in the rear face - two feet rotation in half rotation - higher</td>
<td>Degree</td>
<td>5.5 1.04</td>
<td>8.33 1.03</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Two-legged rotation - higher rotation in the front face - two cross-legged</td>
<td>Degree</td>
<td>4.5 0.547</td>
<td>7.33 1.21</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

At the level of moral significance ≤ (0.05) and the degree of freedom (5)

Through the application of the anaerobic exercises according to the distances in the games that were within the systems of phosphate and Lactic and rationing stressed these exercises and times of hospitalization in proportion to the age and level of performance of the experimental group and the gradualization of the intensity during the training units of training It was clear from the figures shown in the table above that the changes in the measurement of the proportion of lactic Had significant differences for the period in which the exercises were applied. The results showed that the experimental group improved in the above variables with the highest percentages that can be adopted in the future.7

Table 3: Shows the after-effects of the control and experimental groups in functional measurements

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Experimental group -Posttest</th>
<th>Control group- Posttest</th>
<th>Level of significance</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactate concentration in the blood</td>
<td>MI/L</td>
<td>Mean 16.8 SD 2.256</td>
<td>Mean 17.25 SD 1.531</td>
<td>0.684</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Backhand Blow - Two Foot Moves in One Step - Top Rotation in Front Face</td>
<td>Degree</td>
<td>11 1.414</td>
<td>8 1.788</td>
<td>0.009</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Blow in the back - Two feet with a jump - a higher turn in the front face</td>
<td>Degree</td>
<td>9 1.79</td>
<td>8.17 2.02</td>
<td>0.469</td>
<td>Sig.</td>
</tr>
<tr>
<td>Blow in the rear face - two feet rotation in half rotation - higher</td>
<td>Degree</td>
<td>8.33 1.03</td>
<td>7.5 2.07</td>
<td>0.399</td>
<td>Non sig.</td>
</tr>
<tr>
<td>Two-legged rotation - higher rotation in the front face - two cross-legged</td>
<td>Degree</td>
<td>7.33 1.21</td>
<td>6.17 0.752</td>
<td>0.073</td>
<td>Sig.</td>
</tr>
</tbody>
</table>
Discussion

We note from table (3) that there is no significant difference in a very important biochemical variable that plays a prominent role in many activities and sports. It is the concentration of (LA) in the blood which is the second source of anaerobic energy after the phosphate source. The preference for the experimental group is to improve this biochemical index. The researchers attribute the reason for this preference to the nature of the anaerobic exercise, which is characterized by anaerobic endurance times that are very similar to the periods of endurance in the run. This convergence of time and intensity of these exercises enabled the experimental group as it is known that athletes can reduce the concentration of lactic acid after exercise by some low-intensity exercises that accelerate the elimination of acid. In addition, it is possible to reduce the concentration of lactic acid after exercise. It is known that table tennis is classified as short- to medium-term, with short negative intervals between points and stages, accompanied by high oxygenation, so that work in most of its points with oxygen deficiency, so the ATP is destroyed and the lack of oxygen is necessary. This training should be carried out under the nature of this feature. This is done in the number of exercises for the experimental group which is distinguished from the control group which was trained a little more than the times and the literal commitment to the training components the reason for their lack of improvement in speed and their lactic system.

Conclusions

Anaerobic exercises have increased the nervous system’s speed to adapt to high training loads and its resistance to fatigue and improved its ability to quickly receive stimuli and make quick decisions, which was clear from the speed of performance of players, and the exercise of speed has increased the capabilities of players and their ability to end the anaerobic muscles and the speed of disposal Lactic acid accumulated by the maximum voltage, and the high frequency and repetitive training method had a clear effect on biochemical adaptations due to rotation of work and rest periods, allowing during the recovery period to restore the composition of energy compounds Depleting during the effort and the ability to perform subsequent iterations itself efficiently, and find out the actual distances traveled in the game contributed to increasing specialization preparation exercises in line with the nature of the energy exerted in the game and thus exercise applied closer performance

Ethical Clearance: Taken from AL-Najaf education Directorate/Iraq committee

Source of Funding: Self

Conflict of Interest: None

REFERENCES

Clinical Presentation Factors Associated with Length of Pre-Hospital Time in Patients with Acute Exacerbation of Heart Failure in Blitar

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¹Postgraduate Program of Nursing, ²Department of Medicine, ³Department of Nursing, Medical Faculty, Universitas Brawijaya

ABSTRACT

Heart Failure was suffered by 26 million people in the world, and 3,083 people in Indonesia in 2013. Clinical presentation of patients leads them to make a decision for seeking medical care that would affect the length of pre-hospital time. The aim of this study was to analyze clinical presentation factors associated with length of pre-hospital time in patients with acute exacerbation of heart failure in Blitar. This study used an observational analytic design with a cross-sectional approach. 60 respondents were selected by using purposive sampling technique. This study was conducted at Ngudi Waluyo General Hospital and Mardi Waluyo General Hospital. Mann Whitney test found that factors associated with length of pre-hospital time in patients with acute exacerbation of heart failure were chest pain (p=0.001), dyspnea (p=0.007), fatigue (p=0.006), number of symptoms (p=0.000), and acute symptom onset time (p=0.005). Multiple linear regression test showed that chest pain was the most dominant factor associated with length of pre-hospital time in patients with acute exacerbation of heart failure (Beta = -0.422).

Keywords: Acute exacerbation of Heart failure, Pre-hospital time, Clinical presentation factors

Introduction

Heart failure (HF) was suffered by 26 million people in the world which about 1–2% in adult population and 10% in elder population¹,². Prevalence of HF in Indonesia was 0.3% (3,083 people) from total population of Indonesia in 2013 based on symptoms and medical diagnosis³. Blitar has high cases of HF as many as 421 patients came at Ngudi Waluyo general hospital emergency unit and 204 patients at Mardi Waluyo general hospital emergency unit in 2017⁴,⁵.

Rehospitalization in patients with HF often characterized by frequent exacerbations⁶. Even there is no time recommendation yet like myocardial infarction, but it is an important thing for patients. Spending time longer in seeking medical treatment for symptoms of exacerbation could make their condition be worse when they arrive at hospital⁷. Patients with HF who go to hospital longer from onset symptom to arrive at hospital (pre-hospital time) would prolong treatment time for exacerbation and results in longer recovery time, length of hospital stay (LOS) was one day longer than who came within 24 hours since onset (11 vs 10 days), and elevation of Brain Natriuretic Peptide (BNP) which indicated decreation of Left Ventricular Ejection Fraction (LVEF)⁸,⁹.

There are many symptoms experienced by patients with HF including fatigue and dyspnea as typical symptoms¹⁰. Fatigue and dyspnea are common symptoms of HF especially in worsening of HF¹¹. Chest pain is also a common symptom of HF which is caused by ischemic heart diseases¹². Previous studies said that dyspnea and fatigue were associated with the length of time from onset to arrived at hospital. On the contrary, another study revealed that chest pain and dyspnea were not factors that affecting length of pre-hospital time (pre-hospital time) would prolong treatment time for exacerbation and results in longer recovery time,
length of hospital stay (LOS) was one day longer than who came within 24 hours since onset (11 vs 10 days), and elevation of Brain Natriuretic Peptide (BNP) which indicated decreation of Left Ventricular Ejection Fraction (LVEF) 8-9. Other studies showed that chest pain was a factor that decreased duration between symptom and presenting at hospital, but there was no correlation between fatigue and pre-hospital time\textsuperscript{14-15}.

Considering to pre-hospital context, nurses also have a role to investigate about factors associated with pre-hospital time in patients with cardiovascular diseases including HF. The result would be as a basic consideration for looking for the solution to reduce length of pre-hospital time.

**Material and Method**

This study used an observational analytic design with cross-sectional approach, which conducted at Mardi Waluyo General Hospital and Ngudi Waluyo General Hospital Blitar in February to March, 2019. Respondents were 60 patients with acute exacerbation of HF who came to Emergency unit and admitted to inpatient ward, and selected by using purposive sampling technique. Data collection used a questionnaire. Inclusion criteria of respondents were: 1) Aged 55 years old or older; 2) Having family when taking data; 3) Live with family or partner; 4) Non referral/ did not use an ambulance; 5) Came from Blitar region; 6) In stable condition (with criteria: full conscious, respiratory rate less than 30x/minutes or not having chest pain, without ventricular arrhythmia, calm and able to speak; 7) Not having anxiety, does not show signs of moderate-to-severe anxiety or depression based on initial observations and assessments, including: fear, anxiety, tension, unwillingness to communicate with others, feeling prolonged sadness and despair\textsuperscript{16-17}; 8) Data was taken within the first 24 hours after the patient got stable condition. Patients who also diagnosed with a pulmonary infection or cancer after further examination in the ward were excluded.

Duration of pre-hospital time was calculated from the first acute symptom onset (symptom felt more severe than before) until arrived at hospital emergency room\textsuperscript{9}. Data were analyzed by using statistical program (SPSS 20). Bivariate analysis used Mann Whitney test (table 3) because data (length of pre-hospital time) was not normal (p Kolmogorov-smirnov=0.001<0.05), with 95% confidence interval (α=0.05). multivariate analysis was conducted by using multiple linear regression test (table 4) with enter method, and the results fulfill all assumption tests.

**Findings**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>44</td>
<td>73.3</td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>26.7</td>
</tr>
<tr>
<td><strong>Chest pain</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chest pain</td>
<td>36</td>
<td>60</td>
</tr>
<tr>
<td>Chest pain</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td><strong>Fatigue</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No fatigue</td>
<td>22</td>
<td>36.7</td>
</tr>
<tr>
<td>Fatigue</td>
<td>38</td>
<td>63.3</td>
</tr>
<tr>
<td><strong>Dispnea</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No dyspnea</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>56</td>
<td>93.3</td>
</tr>
<tr>
<td><strong>Number of symptoms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 symptoms</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>1-2 symptoms</td>
<td>42</td>
<td>70</td>
</tr>
<tr>
<td><strong>Acute symptom onset time</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06.00 a.m.–06.00 p.m.</td>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td>06.00 p.m.–06.00 a.m.</td>
<td>33</td>
<td>55</td>
</tr>
</tbody>
</table>

Table 1 shows that 44 respondents (73.3%) were female, 24 (40%) respondents had chest pain, 38 (63.3%) respondents had fatigue, 56 (93.3%) respondents had dyspnea, 42 (70%) respondents had 1-2 symptoms, 33 (55%) respondents experienced acute exacerbation symptoms at 06.00 p.m.–06.00 a.m.
Table 2: Distribution of respondents based on pre-hospital time

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median</th>
<th>Min-Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-hospital time (minutes)</td>
<td>321.5</td>
<td>30–1017</td>
</tr>
<tr>
<td>1. Acute Symptom onset–Decision making</td>
<td>175</td>
<td>0–1060</td>
</tr>
<tr>
<td>2. Decision making–Transportation started going to hospital</td>
<td>30</td>
<td>0–690</td>
</tr>
<tr>
<td>3. Transportation started going–arrived at hospital emergency unit</td>
<td>31</td>
<td>10–170</td>
</tr>
</tbody>
</table>

According to table 2, median of length of pre-hospital time was 321.5 minutes. The longest time was decision making to seek emergency care with median 175 minutes.

Table 3: Clinical presentation factors associated with length of pre-hospital time

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median (Min-Maks)</th>
<th>Mean Rank</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest Pain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chest pain</td>
<td>483.50(30–1017)</td>
<td>36.49</td>
<td>0.001</td>
</tr>
<tr>
<td>Chest pain</td>
<td>119(30–965)</td>
<td>21.52</td>
<td></td>
</tr>
<tr>
<td>Dyspnea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No dyspnea</td>
<td>810(705–945)</td>
<td>53.25</td>
<td>0.007</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>280(30–1017)</td>
<td>28.88</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No fatigue</td>
<td>637.50(30–1017)</td>
<td>38.68</td>
<td>0.006</td>
</tr>
<tr>
<td>Fatigue</td>
<td>210(30–965)</td>
<td>25.76</td>
<td></td>
</tr>
<tr>
<td>Number of Symptom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 symptoms</td>
<td>102.5(30–965)</td>
<td>17.92</td>
<td>0.000</td>
</tr>
<tr>
<td>1–2 symptoms</td>
<td>456(30–1017)</td>
<td>35.89</td>
<td></td>
</tr>
<tr>
<td>Acute Symptom Onset Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute onset time 06.00 a.m.–06.00 p.m.</td>
<td>240(30–1017)</td>
<td>23.54</td>
<td>0.005</td>
</tr>
<tr>
<td>Acute onset time 06.00 p.m.–06.00 a.m.</td>
<td>610(60–965)</td>
<td>36.20</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that factors associated with length of pre-hospital time in patients with acute exacerbations of HF were chest pain, dyspnea, fatigue, number of symptoms, and acute symptoms onset time.

Table 4: Predictor of length of pre-hospital time in patients with acute exacerbation of heart failure

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Beta</th>
<th>P value</th>
<th>R</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constanta</td>
<td>1074.442</td>
<td>-0.422</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest pain</td>
<td>-259.272</td>
<td>-0.361</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyspnea</td>
<td>-436.187</td>
<td>-0.408</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>-254.875</td>
<td>-0.361</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute symptom onset time</td>
<td>207.003</td>
<td>0.342</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of symptoms</td>
<td>-157.320</td>
<td>-0.239</td>
<td>0.255</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen from table 4, factors associated with length of pre-hospital time were chest pain, dyspnea, fatigue, acute symptom onset time. Number of symptoms is a confounding factor, and chest pain was the most dominant predictor of pre-hospital time.

Discussion

Number of symptoms is a confounding factor, and chest pain was the most dominant predictor of pre-hospital time. It is similar to a study conducted by
Darling et al. showed that chest pain was a factor that shortened pre-hospital time in patients with HF, because it was considered as a specific or severe symptom by patients\textsuperscript{14}. Another research also found that chest pain was a predictor of duration time between symptoms and arriving at hospital in patients with HF\textsuperscript{15}. Chest pain was known as a symptom caused by heart disease, so patients will tend to seek medical care immediately. In this study, 24 respondents complained of chest pain as the main complaint and felt burdensome. They said that chest pain felt suddenly, like burned and translucent to their back, could not disappear with taking a rest, and get more severe. It disturbed their comfort despite while they were not doing any activity, so they decided to go to hospital immediately. In contrast, another study showed that there was no difference between chest pain in patients who came >2 hours (delay) after symptom onset and those who came <2 hours (not delay)\textsuperscript{13}. It could be caused of the intensity of pain was not severe before entering the hospital. However, in this study, chest pain of acute exacerbation phase they felt was moderate to severe pain scale and continuously.

In this study, dyspnea reduced 436.187 minutes of pre-hospital time. It is consistent with a research carried out by Darling et al. which showed that dyspnea was a factor that reduced pre-hospital time delay in patients with HF\textsuperscript{14}. Another research also revealed that dyspnea (at rest and during activity) was related to length of time between worsening symptoms and seeking medical care\textsuperscript{11}. Continuous and burdensome dyspnea could increase patient distress and cause inability to carry out activities, so patients and families decided to seek medical care at hospital immediately\textsuperscript{7}. In this study, 56 respondents had dyspnea and it was the main complaint and get more severe than before. They felt discomfort due to dyspnea when they walked only in a few meters, even when they did not do any activity. However, a study explained that dyspnea was the most influencing factor in prolonging of pre-hospital time, which patients with dyspnea had 4.6 times risk to get delay in pre-hospital time, because dyspnea has gradual pattern, so patients and families did not realize that it is a sign of worsening condition and did not seek for medical care at hospital rapidly\textsuperscript{11,18}. This difference in finding might cause of different samples, so the calculation pattern of pre-hospital time was also different. However, the average time of dyspnea onset was 3 days but with a mild or not severe intensity, so they chose to take a rest first to eliminate this symptom. Contrary to this result, another study showed that there was no significant difference of pre-hospital time in patients with HF\textsuperscript{13}.

Fatigue also reduced 254.875 minutes of pre-hospital time. This result is in line with research conducted by Neuwenhuis et al. that showed a relationship between fatigue and length of time between onset to arriving at hospital\textsuperscript{15}. Another research also showed a significant difference between patients who were came \textless;72 hours and who came ≥72 hours from acute symptom till arrived at hospital\textsuperscript{18}. In this research, fatigue often followed dyspnea, so patients also felt it when they were not doing any activity or have a light activity. It made them could not move or do any activity as usual. When it felt burdensome with dyspnea, then they decide to go to hospital. On the other hand, a study said that fatigue was the most common symptom in worsening HF, but usually in elderly people, they would perceive it as a condition that usually occurs in the elderly, so they did not consider it as a serious or threatening condition and waited until the symptoms decreased\textsuperscript{11}. Contrary to this study, other studies found that fatigue was not related to the duration of acute HF patients in seeking medical care to hospital\textsuperscript{13-14}.

In this research, number of symptoms is a confounding factor which patient who had 1-2 symptoms was had 157.320 minutes shorter. 70\% of respondents had 1-2 symptoms (combination between either chest pain, dyspnea or fatigue). It is not in accordance with another study which showed relationship between number of symptoms with pre-hospital time delay\textsuperscript{11}. However, another study said that patients who had ≥3 acute symptoms were more likely to be delay in seeking medical care than those who had fewer symptoms\textsuperscript{13}. In addition, the symptoms were acute and got more severe, so even though 1 or 2 symptoms but it would make patients and families looking for emergency medical treatment immediately\textsuperscript{7}.

Furthermore, acute symptom onset time associated with length of pre-hospital time which acute symptom at 06.00 p.m.–06.00 a.m. reduced 207.003 minutes of the time.. 55\% of respondents had acute exacerbation symptoms onset at night and waited until the next morning. Patients said that they did not want to disturb their families who were sleeping. Patients who did not have private vehicles also did not want to disturb relatives or neighbors at night about borrowing a vehicle for going to hospital, so they chose to take a rest till
Feeling worried or being reluctant to disturb family or health worker at night, do not consider symptom as a serious condition, wait to evaluate any improvement in symptoms in the next morning associated with delay in pre hospital time\textsuperscript{7,14,19}. Contrary to this study, a study showed that onset time at 8.30-17.30 was a factor that prolongs time from symptom to hospital, because this time is busy or working hours\textsuperscript{15}. It is different from the conditions in Blitar, where ambulance service 118 is not available yet. There is no public transportation also like in other cities but inter-city transportation only operates from 6.00 a.m. to 03.00 p.m., so it makes no traffic jam there during working hours. In addition, online transportation is only available in Wlingi and Blitar city, so most of the respondents had to contact other families, relatives or neighbors to loan a vehicle to take patients to the hospital. This is supported by a study that an attempt to contact family or friends first was related to pre-hospital time\textsuperscript{14}. This condition also explained in a review that patients who live in rural area are more have prolonged pre-hospital time because they do not have transportation\textsuperscript{7}.

**Conclusion**

Factors associated with length of pre-hospital time in patients with acute exacerbation of heart failure in Blitar were chest pain, dyspnea, fatigue, and acute symptom onset time, which chest pain is the most predictor. Further research about social support factors is needed to investigate the association with pre-hospital time in patients with acute exacerbation of heart failure.

**Conflict of Interest:** None

**Ethical Clearance:** This study was approved by ethical committee of Medical Faculty Universitas Brawijaya with number 11/EC/KEPK-S2/01/2019.

**Source of Funding:** None

**REFERENCES**


Transforming Growth Factor β1 in the Different Stages of Breast Cancer Patients

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ABSTRACT

Background: Transforming growth factor β1 (TGF β1) is one of the proteins which has a multifunctional role in breast cancer. It is considered an inhibitor in early stages and promoter in advanced stages of breast cancer.

Objective: The aim of this study is to know the benefit of using TGF β1 as predictor marker in breast cancer patients in different stages of the disease.

Method: Transforming growth factor β1 were determined from 52 patients with breast cancer in the early stage of the tumor (І+ІІ) 61% and advanced stage (ІІІ+ІѴ) 39% and 25 subjects as a control group by using Enzyme Linked Immunosorbent Assay (ELISA).

Results: The results showed a high level of TGF β1 (p˂ 0.05) in breast cancer patients compared with the control group. Depending on the stage of the tumor, TGF β1 was more level in these patients with stage II than stage I and stage IV (p˂0.03, 0.029) respectively. So this study showed no any significant differences between the early stage of the tumor and advanced stage of the tumor.

Keywords: TGF β1, Breast cancer, serum

Introduction

Breast cancer is one of the most common cancers worldwide especially in Iraq after the war in 1990 and 2003. The radiation of weapons that contain depleted uranium was one of the causes of cancer (1). Many substances as transforming growth factor plays a pivotal role in progression or suppression tumor in the stages of breast cancer (2). TGFβ1 exist as a homodimer and is released as in active form. It is expressed by many normal cells and organs and influences both normal and tumor cells process in the mammary gland (3,4). Very little studies are estimated the circulating TGF β1 as predictor marker in patients with breast cancer. It is increased in the early stage of the tumor and can be used as a predictor clinical marker of breast cancer (5). In early-stage, TGF β1 acts as a growth inhibitor of epithelial cells whereas in the advanced stage of tumor TGF β1 exchange its activity into tumor promoter and effect on cancer metastasis (6). It acts as an inhibitor of tumor angiogenesis in early stage and activator of tumor angiogenesis in late stage (7). This double function puzzled the researchers for many years (8). However, TGF β1 can adjust cancer-related process, like cell infestation, malignant growth, and microenvironment modification (7).

Method

Study Design: The current study was designed as a Case-control study which includes 52 patients with breast cancer their age ranging between 25 to 75 years old and 25 subject their age-matched with the patients as a healthy control group. Patients were enrolled from the oncology unit at Al-Husseini Hospital, Kerbala, Iraq, in the period from October 2017 to April 2018. Those patients were diagnosed as breast cancer by

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histopathological examination. A questionnaire was designed to obtain information about the patient. It contained the name, age, weight, height, smoking, menopausal, treatment, contraceptive, family history of cancer, abortion, breast feeding, and the living.

Collection of Specimens: Blood samples were drawn from the venipuncture, and then were let it to stand for 30 min. at room temperature. Sera were separated by using centrifuge at 3000 xg for 15 min., and then stored at -70°C until uses.

All samples were taken before surgery.

Determination of TGF β1: The level of serum TGF β1 was measured by using the Enzyme Linked Immuno Sorbent Assay (ELISA). A sandwich ELISA was used and a target-specific antibody has been pre-coated in the wells. Samples, standards, and controls were added into these wells and bind to the immobilized (capture) antibody. The sandwich is formed by the addition of the secondary antibody; a substrate solution was added that reacts with the enzyme-antibody-target complex to produce a measurable signal. The intensity of this signal is directly proportional to the concentration of TGF β1 present in the original specimen (9).

Statistical Analysis: Statistical Package for Social Sciences (SPSS) version 24 was used for statistical analysis. Data were expressed as mean (SD) for normality distribution and median for non-normality distribution. Kolmogorov-Smirnov test displays the non-normality distribution of TGF β1, so Mann-Whitney U test was used. P-value ≤ 0.05 was considered significant.

Results

The characteristic feature of the patient with breast cancer is shown in Table - 1. The statistical analysis showed a significant (p<0.001) elevated level of TGF β1 in those patients with the breast cancer compared with the healthy control group (Table 2). During the tumorigeneses, the level of TGF β1 exchange but not significantly (p > 0.05) between early and advanced stage of the tumor, whereas significant (p < 0.0001) elevation of TGF β1 in subgroups, early stage and advanced stage as compared with control group respectively (Table 3) (Fig.1). Patients were classified into four groups depending on the stage of the tumor. Transforming growth factor TGF β1 was significantly (p < 0.03) elevated in patients with stage I comparing with stage II and significant (p<0.029) elevated level in patients with stage IV comparing with those of stage II of cancer (Table 4).

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(25-39)</td>
<td>15</td>
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<td>(40-59)</td>
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<td>62</td>
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<tr>
<td>(60-75)</td>
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<td>10</td>
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<td>Obesity</td>
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<td></td>
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<td>Obese</td>
<td>35</td>
<td>67</td>
</tr>
<tr>
<td>Non-obese</td>
<td>17</td>
<td>33</td>
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<tr>
<td>Smoking</td>
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<td></td>
</tr>
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<td>Smoker</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Non-smoker</td>
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<td>96</td>
</tr>
<tr>
<td>Stage of Cancer</td>
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<td></td>
</tr>
<tr>
<td>Stage I</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Stage II</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>Stage III</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>Stage IV</td>
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<td>12</td>
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<tr>
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<td>7</td>
<td>13</td>
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<td>No</td>
<td>45</td>
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<tr>
<td>Menopausal</td>
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<td></td>
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<tr>
<td>Pre-menopausal</td>
<td>23</td>
<td>44</td>
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<tr>
<td>Post-menopausal</td>
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<td>Chemotherapy treatment</td>
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<td>27</td>
<td>52</td>
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<td>Radiotherapy treatment</td>
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<td>Yes</td>
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<td>25</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
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<td>Family History</td>
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<tr>
<td>With family history</td>
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<td>25</td>
</tr>
<tr>
<td>Without family history</td>
<td>39</td>
<td>75</td>
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<tr>
<td>Contraceptive</td>
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<td>Intake</td>
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<td>67</td>
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<tr>
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<td>17</td>
<td>33</td>
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<td>Abortion</td>
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<tr>
<td>Have a miscarriage</td>
<td>34</td>
<td>65</td>
</tr>
<tr>
<td>Haven’t miscarriage</td>
<td>18</td>
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Conted…

<table>
<thead>
<tr>
<th>Breast feeding</th>
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<tr>
<td>Lactating</td>
<td>39</td>
<td>75</td>
</tr>
<tr>
<td>Not lactating</td>
<td>13</td>
<td>25</td>
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<table>
<thead>
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<th>Marriage</th>
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</thead>
<tbody>
<tr>
<td>Married</td>
<td>45</td>
<td>86</td>
</tr>
<tr>
<td>Unmarried</td>
<td>7</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Living</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Town</td>
<td>37</td>
<td>71</td>
</tr>
<tr>
<td>Village</td>
<td>15</td>
<td>29</td>
</tr>
</tbody>
</table>

Table 2: The level of serum TGF β1 (pg/ml) in patients with breast cancer and control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients Control</th>
<th>Control</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>48.2 ± 22.3</td>
<td>45 ± 25.4</td>
<td>0.12</td>
</tr>
<tr>
<td>TGFβ1</td>
<td>271.75(69.6-9924)</td>
<td>84.7(0.05-7184)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Table 3: The level of serum TGF β1 (pg/ml) relative to stage of cancer

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>TGFβ1 (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early stage (I+II)</td>
<td>32</td>
<td>286.05 (69.6-6827.3)</td>
</tr>
<tr>
<td>Advanced stage (III+IV)</td>
<td>20</td>
<td>235.61(129-9924.3)</td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>84.7(0.05-7184)</td>
</tr>
</tbody>
</table>

Early stage vs. advanced stage (p=0.26)  
Early stage vs. control (p < 0.0001)  
Advanced stage vs. control (p < 0.0001)

Table 4: The level of TGF β1 in the stages of cancer

<table>
<thead>
<tr>
<th>Stages</th>
<th>TGFβ1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>244.75(69.6-5334.7)</td>
</tr>
<tr>
<td>Stage II</td>
<td>335.15(166.6-6827.3)</td>
</tr>
<tr>
<td>Stage III</td>
<td>235.61(146.9-3974.7)</td>
</tr>
<tr>
<td>Stage IV</td>
<td>239(129-9924.3)</td>
</tr>
</tbody>
</table>

(P= 0.03, 0.07 and 0.82) stage I vs. II, III and IV respectively  
(p= 0.056 and 0.029) stage II vs. III and IV respectively  
(p= 0.84) stage III vs. IV

Discussion

This study focused on the correlation between serum TGF β1 and breast cancer because the physician considered all data which helped him in the prognosis of cancer (10).

Transforming growth factor TGF β1 acts as an inhibitor of mammary endothelial proliferation and regulator of mammary ductal and alveolar development (11).

The results of this study showed the elevated level of TGF β1 in patients with breast cancer compared with the control group. This elevation due to the high expression for synthesis TGF β1 and its association with oncogenic activity (1). Several studies had also the same results and explained the overproduction of TGF β1 in many tumors especially in those with breast cancer. It is related to the tumor progression. Tumor cells produce TGF β1 which enhancing tumor growth through promoting angiogenesis and avoiding immune surveillance (10). Iavanovic´ et al, (2003) approved the significantly elevated level of TGF β1 in breast cancer patients compared with healthy group (12). Also, Papadopoulou et al. (2008) are indicating the highest level of TGF β1 in breast cancer patients in compared to the control group (11). Several projects study these associations between the expression of TGF β1 and breast cancer (13).

This study didn’t show significant differences between the early stages of cancer and advanced stage, although there is a difference in the concentration of TGF β1 between two stages. The reduced level of TGF β1 in stage II may be due to losing the function of TGF β1 protein receptor (14). Palmari et al, (2006) revealed
the increased level of TGF β1 during tumorigenesis and metastasis stage (14). Other studies reported that there is no significant relationship between serum TGF β1 and stages of breast cancer patients (15)(16). This finding was corresponding with the results of this study. Michael et al (2014) study’s showed a significant correlation of TGF β1 and tumor size (15). Nataša et al (2003) explain the overexpression of TGF β1 in early stage of breast tumor. At a certain stage of breast cancer, there is a shift in TGF β1 action (17). The increment expression of TGF β1 in early stages (I/II), it would be an advantage for the host, but not for tumor itself (17). Shim et al (1999) study’s showed a significantly high level of TGF β1 in patients with colorectal carcinoma relative to the healthy group and there is a correlation between the level of TGF β1 and progression of the tumor (18).

Patient with both early stage and advanced stage showed a high level of TGF β1 relative to the control group. This finding was similar to Dave et al, (2012) (19).

The treatment with radiotherapy and chemotherapy can increase TGFβ1 action and then enhancing tumor metastasis. So the inhibition of TGFβ1 promotes sensibility tumor into radiotherapy and chemotherapy (15). Boothe et al. (2011) are confirmed that TGF β1 is related to the increased fibrosis caused by radiation (20).

For women who take contraceptives, studies have shown a low correlation between contraceptives and breast cancer, and this fact matched with the results of the study(21).

Many projects studied another type of cancer which include prostate, thyroid, ovarian, and breast cancer which exhibit a significant elevation in the concentration of TGF β1 in those patients compared with the control group (22)(23)(24)(25).

Conclusion

Transforming growth factor TGF β1 play a significant role in tumorigenoses and can be used as predictor marker in breast cancer.

Ethical Clearance: We are committed to the ethics of scientific research

Conflict of Interest: Nil

Source of Funding: Self

References


ABSTRACT

Background: Globally, suicide is a cause of premature death among young people. A survey done in Indonesia’s students revealed that suicidal thought was experienced by around 5%. In Jakarta, a 2015 preliminary study found a higher figure of 18.6% of high school student experienced suicidal ideation. This demonstrated an urgent need for intervention in the prevention and progression from suicidal ideation to suicide attempts. Therefore, this study aims to develop an instrument, named as The Risk Factors of Suicidal Ideation, for early detection of risk factors of suicidal thought in students.

Method: This cross-sectional study was conducted in 2018 in Jakarta Province. A research-based, self-administered questionnaire was developed to assess the risk of suicide in high-school students. The study sample comprised 910 students from 10 high schools; the schools were chosen through stratified random sampling. Some statistical analysis was used to show the validity and reliability of this instrument.

Results: This study produced a Risk Factors of Suicidal Ideation (RFSI) questionnaire consisting of 14 items incorporating four dimensions: belongingness, loneliness, hopelessness, and burdensomeness. The questionnaire achieved an 88.2% Cronbach’s alpha rating, indicating high reliability. Meanwhile, the instrument’s construct validity ranked high by Kaiser-Meyer-Olkin test (.812), and a Bartlett test score of <0.0001 confirmed the integrity of its factor analysis.

Conclusion: The questionnaire is reliable and valid in assessing the risk factors of suicidal ideation among high-school students of Jakarta Province. Screening as part of an intervention strategy for suicide prevention can have an important role in decreasing suicidal ideation.

Keywords: suicide risk-assessment questionnaire, suicidal ideation, high-school students
Research has shown it is important to detect risk factors before they develop into suicidal ideation. Consistently across countries, about 60% of transitions from suicidal ideation to planning and from planning to an attempt occurred within a year of the onset of ideation. Studies also found that adolescents who reported suicidal ideation at age 15 were almost 12 times more likely to make a suicide attempt between the ages of 15 and 30, compared with adolescents who did not have suicidal ideation at baseline, with no sex differences.

By considering the previous data, this current study was conducted to develop a research-based questionnaire to assess the presence of those factors among high-school students in Jakarta. Various self-report questionnaires were evaluated, but they lacked efficiency for this purpose, and Apter has made a convincing argument against the reliability of data self-reported by adolescents. This study’s research questionnaire is more useful in the early detection of behaviors that lead to suicidal ideation. The idea to develop this research began after conducting a document review of a previously developed instrument by the Ministry of Health. In April 2016, the ministry’s Directorate General of Disease Control and Prevention submitted a report on the psychometric characteristics of the government’s Service Evaluation on Mental Health Cases (EPK2J) questionnaire, which was designed in 2015 to research suicidal tendencies among 502 adult respondents in four cities. The directorate recommended further study, both theoretically and empirically, to determine whether five dimensions which overall consisting of 28 items could reliably measure a person’s tendency to suicide. The dimensions were: burdensomeness, belongingness, impulsiveness, hopelessness, and loneliness. The EPK2J questionnaire was developed by combining several instruments to meet the need for Indonesian locality. The instruments were: the Interpersonal Needs Questionnaire, the UCLA Loneliness Scale, the Brief Hopelessness Scale, and the Suicide Behavior Questionnaire – Revised.

Risk factors for suicide include mood disorders and previous suicide attempts. Substantial research has been done to support the connection between major depression and teen suicide. Taking this into account, depression is also examined in this study. Effective adolescent depression-screening instruments include Patient Health Questionnaire-9 (PHQ-9) and -2 (PHQ-2). This research utilizes the PHQ-9 Adolescent.

Method

This cross-sectional study was conducted in 2018 in 10 schools in Jakarta Province. The study population was high-school students aged 14–18. For the purposes of quantitative research analysis, the minimum required sample size was adjusted according to the sample calculation formula for the two-proportion population hypothesis test (two-sided test) with a minimum sample size of 596 samples, which was increased in consideration of the dropout rate of 10%. The acquired sample size was 910.

To determine the sample size in high schools, a list of all high schools in Jakarta Province was prepared. The schools were chosen with stratified random sampling after determining the A-accredited high schools. Five schools were public vocational and five schools were general public. Each school was targeted to get 100 samples with random selection between grades 10, 11 and 12.

The questionnaire in this study is derived from the EPK2J questionnaire for adults in health-care facility settings. This study developed EPK2J into a special questionnaire for adolescents in the school setting. The questionnaire was then tested in schools. The questionnaire included an introduction explaining the importance of filling it out carefully and answering every question, with an additional note emphasizing confidentiality. The assessors or surveyors then brief students on how to answer the questions. Once the students completed the questionnaire, they were gathered and delivered to the researcher.

Data were inserted and analyzed using the SPSS software (version 21.0). Construct validity tests were performed for the items of all components using exploratory factor analyses, which took into account the items’ response format. Factors were extracted using the principal component analysis, followed by orthogonal rotation. Prior to the exploratory factor analyses, the Kaiser-Meyer-Olkin test measure was obtained and Bartlett’s test of sphericity was performed. The reliability analysis was performed using the Cronbach’s alpha coefficients for each factor that emerged from the analysis.

Results

The questionnaire’s content- and face-validity were determined through two focus group discussions. The questionnaire was handed to expert child and adolescent psychiatrists in the Indonesian Psychological Association,
the Child and Adolescent Psychiatry Section in the Indonesian Psychiatric Association, the suicide-prevention NGO Into the Light, the Ministry of Health’s Research and Development Agency, the Ministry’s Directorate of Prevention and Control of Mental Health and Drug Problems, the Association of Clinical Psychologists, and the Indonesian Youth Mental Health Association. After the input from two focus group discussions, the questionnaire started with 28 items and was revised to 27 based on the suggestions made by these experts. Each statement was scored at four levels: Do Not Agree, Somewhat Agree, Agree, and Strongly Agree.

To test the reliability of the questionnaire, the ten schools were selected by random stratification. Students filled out 910 questionnaires; high-school students completed 435 and vocational-school students completed 475. Of the high-school students, 65.4% were girls and 34.6% were boys, with an average age of 16 and a range of 14–18 years. Cronbach’s alpha, estimated on all participants, was 88.2% of the total score (final 14 items). These values were interpreted as having excellent internal consistency. The KMO was 0.812, and significant of Bartlett test was <0.0001.

Of the respondents who took the PHQ-9 Adolescent on depression severity, 28.4% of respondents scored minimal/none, 43.5% mild, 17.7% moderate, 5.5% moderately severe, and 1.3% severe. Additional questions in the PHQ-9 Adolescent were: “Has there been a time in the past month when you had serious thoughts about ending your life?” (5.4% answered “yes”) and “Have you ever, in your whole life, tried to kill yourself or made a suicide attempt?” (8.1% answered “yes”). The suicidal ideation score was used as a proxy for measuring the content validity of the developed questionnaire on suicide risk assessment. With gender differentiation, the results of suicidal ideation utilizing PHQ-9 were 5.5% of females and 5.1% of males. Regarding the suicide-attempt question, the results were 8.7% of females and 7% of males.

Furthermore, the cut-off of suicide risk factors was sought using the receiving operating characteristic curve (ROC) analysis. A cut-off score for the suicide risk-assessment questionnaire was set at ≥ 31 of 56 scales with a sensitivity of 0.776 and a specificity of 0.771. Utilizing the final Risk Factors of Suicidal Ideation (RFSI) questionnaire with cut-off score of ≥ 31, the result showed a higher proportion of students reporting higher risk in girls (28.8%) than boys (20.7%).

**Discussion**

The suicide risk-assessment questionnaire captured a larger number of students than the PHQ-9 Adolescent because it was intended as early detection of suicide risk. It also showed that female students are at higher risk than male students, which echoes the results of PHQ-9 Adolescent. It is hoped a screening for early detection will prevent the development of suicidal ideation, which could lessen the likelihood of an attempt. According to a recent study, school-based mental-health programs must take into consideration a gender-based approach. Eventually, in line with the objective of early detection of risk factors, this developed instrument can be labeled as “Risk Factors of Suicidal Ideation (RFSI)”.

The questionnaire developed through this study was not previously available in Indonesia. So far, one of the instruments used in Indonesia for adolescent mental health programs in schools include the Strength and Difficulties Questionnaire (SDQ), the results of which are recorded in a student’s Health Report Card (Rapor Kesehatan Anak) and School Health Efforts Program (Usaha Kesehatan Sekolah).

As with the SDQ questionnaire, the RFSI questionnaire developed in this study might be incorporated into School Health Efforts programs and make up a part of a student’s Health Report Card. In the instructions for implementing mental-health services in schools that are integrated with the School Health Efforts Program, there is a chapter on mental-health intervention using the SDQ to address problems with learning achievement and/or behavior. The result of the School Health Efforts Program has to be followed up. Educators should patiently and attentively talk and listen to students, involving parents and classmates to help.

Peer counselors from schools are partnered with community health centers to manage services for local teenagers. Peer counselors must also have basic knowledge about the role of a counselor, connecting adolescents with competent healthcare workers who will make the appropriate referrals. This is important if the RFSI indicates a high risk of suicide tendencies. As an example, there was a health center in DKI Jakarta creating an android-based psychiatric or mental-health application called eJiwa; it uses a self-administered questionnaire, an excellent idea, given how many internet-users are teenagers.
Another highlight of the Health Ministry’s program is the Minimum Service Standards that covers the types of basic services in the form of health services at productive age with basic service quality according to the standards of productive age health screening. Basic service recipients are Indonesian citizens aged 15–59. Screening services include the detection of emotional and behavioral disorders, which makes them suitable for incorporating the RFSI. \(^{18}\)

One of the Ministry of Health’s innovations is Sehatpedia application, a form of digital-era health innovation. \(^{19}\) Adolescents must be exposed to digital health services, including the screening process. It is possible that the RFSI questionnaire could also be included in Sehatpedia so that the coverage area is greater than eJiwa, which is only focused on DKI Jakarta.

**Conclusion**

This study found that screening could be applied quickly to detect any disturbances or risk factors that humans did not even realize before. The screening instrument is a self-administered suicide risk-assessment questionnaire, named as RFSI, that can be given to high-school students in school settings to detect the risk factors of suicide ideation.

**Ethical Considerations:** Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors with ethical approval number 134/UN2.F10/PPM.00.02/2018 from The Research and Community Engagement Ethical Committee Faculty of Public Health University of Indonesia.

**Acknowledgments**

This work was financially supported by WHO.

**Conflict of Interest:** None declared.

(Download questionnaire http://bit.ly/appendixrfsi14)

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The Effect of Chlorhexidine Tooth Paste on the Tooth Shade  
(A Comparative Study)

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ABSTRACT

The objective of this study was to analyze the effect on the tooth shade of a chlorhexidine toothpaste in comparison with three edible toothpastes with the widest worldwide distribution (Colgate, Crest and Signal). The study group was formed of 48 volunteer young adult female dental students (3rd stage) aged 20 years having a fully dentulous anterior dentition and a good oral health status. The shade of the teeth before the study was mostly 2M1 followed 1M1, 2L1.5 and 2R1.5 then 2M2. The majority of the control group subjects (94%) showed no tooth shade changes, 25% of the subjects who used Laculut Aktiv toothpaste showed a mild tooth shade change and no subject showed moderate or severe shade change. Chi square showed these shade differences to be statistically non-significant (p<0.05). Prolonged brushing with Laculut Aktiv toothpaste darkens tooth shade.

Keywords: Tooth shade, chlorhexidine tooth paste, microorganisms, antimicrobial agent

Introduction

Toothpastes are daily oral care products, the chemical composition of which is constantly changing due to manufacturer’s competition. Toothpastes are recognized as the best source of fluoride, and now chlorhexidine which most effectively protects both deciduous and permanent teeth from caries.(1,2)

Toothpaste is classified as drugs not cosmetics because drugs should contain an ingredient to achieve the effect the consumer desires. It is important to determine if different brands of tooth paste contain effective antibacterial ingredient such as fluoride, chlorhexidine and xylitol to reduce bacterial load in human mouth and contribute to dental health. (3)

Teeth are typically composed of a number of colours and a gradation of colour occurs in an individual tooth from the gingival margin to the incisal edge of the tooth. The gingival margin often has a darker appearance because of the close approximation of the dentine below the enamel. In most people canine teeth are darker than central and lateral incisors and younger people characteristically have lighter teeth, particularly in the primary dentition. (4)

The science of colour is important in dentistry with regard to colour perception and description, and can be improved with training. The viewing conditions are extremely important and variables such as the light source, time of day, surrounding conditions and the angle the tooth is viewed from affect the apparent tooth colour. Light is composed of differing wavelengths and the same tooth viewed under different conditions will exhibit a different colour, a phenomenon known as metamerism. In judging tooth colour it is best if the light source used is standardised to reduce the effects of metamerism. It is common to find three sources of light in a dental surgery; natural, fluorescent and incandescent. (5)

Historically, tooth discoloration has been classified according to the location of the stain, which may be either intrinsic or extrinsic. It may also be of merit to consider a further category of internalised stain or discolouration. (6)

Extrinsic discolouration is outside the tooth substance and lies on the tooth surface or in the acquired pellicle. The origin of the stain may be either metallic or non-metallic. (6,7)

The causes of extrinsic staining can be divided into two categories; those compounds which are incorporated into the pellicle and produce a stain as a result of their basic colour, and those which lead to staining caused by chemical interaction at the tooth surface. These organic chromogens are taken up by the pellicle and the colour imparted is determined by the natural colour of the chromogen. (6)
Indirect extrinsic tooth staining is associated with cationic antiseptics and metal salts. The agent is without colour or a different colour from the stain produced on the tooth surface. Interest in the mechanisms of extrinsic tooth staining was mentioned by Flotra et al. that tooth staining increases with the use of chlorhexidine. These non-metallic extrinsic stains are adsorbed onto tooth surface deposits such as plaque or the acquired pellicle. The possible aetiological agents include dietary components, beverages, tobacco, mouthrinses and other medicaments. (8)

The characteristic staining of the tongue and teeth noted by Flotra et al. (8) is not peculiar to chlorhexidine, it has been reported in other cationic antiseptics, the essential oil/phenolic mouthrinse ‘Listerine’(9) and following prolonged use of delmopinol mouth rinses. (10)

The study aimed to compare dental staining associated with chlorhexidine based tooth paste (Laculut, Aktiv) in comparison to 3 brands of regular tooth pastes (Crest, Colgate and Signal).

**Materials and Method**

**Sample:** A sample of 48 volunteer young adult female (3rd stage dental students) aged 20 years having a fully dentulous anterior dentition and a good oral health status was enrolled in the study. They were all non-smokers.

**Grouping:** The participants were randomly allocated to four groups (12 individuals each) depending on the type of tooth paste they would use (Crest tooth paste, Colgate tooth paste, Signal tooth paste, Laculut Aktiv chlorhexidine based tooth paste).

**Method:** All the individuals were asked to brush their teeth three times a day for the whole period of the study (12 weeks), and were instructed not to drink coffee with minimal tea consumption (up to 2 cups a day). The individuals were examined weekly to encourage adherence to oral hygiene measures.

**Shade Measurement:** Tooth shade measurement was done by observation of the middle third of the labial surface of the maxillary right central incisor and comparing its shade with Vita 3D Master Shade Guide. The readings were taken at noon time and on the same dental chair to minimize the effect of surrounding light. In the beginning of the study, efficient scaling and polishing was performed to all the teeth and a baseline tooth shade was registered. At the end of the 12-week experimental period, another shade reading was registered after the patients brushed their teeth. If the teeth become one level darker, this was regarded as mild color change; while two levels darker was regarded as mild color change; and three levels darker was regarded as severe color change.

**Consent Form:** Before commencing in the study, the nature of the experiment was described to each individual outlining the commitment to protocol, risks and benefits, and the right to withdrawal. After answering any queries, a consent form was signed.

**Calibration and Standardization:** All the patients were examined on the same dental chair under fluorescent light. Inter-examiner calibration of shade measurement was performed on 20 subjects and proved to be statistically non-significant. A second intra-examiner reading was taken after 2 weeks to eliminate memory bias and was also statistically non-significant.

**Results**

The shade of the teeth before the study was measured and displayed in figure 1. The most prevalent shade was 2M1 followed 1M1, 2L1.5 and 2R1.5 then 2M2 and lastly 3L1.5.

The majority of the control group subjects (using Crest, Colgate, and Signal tooth pastes) showed the same tooth shade in baseline as after 12 weeks. Only 2 subjects of the 36 showed a mild shade change in groups Crest and Colgate tooth pastes.

On the other hand, 25% of the subjects who used Laculut Aktiv tooth paste showed a mild tooth shade change while no subject showed moderate or severe shade change. However, Chi square showed these shade differences to be statistically non-significant (p<0.05).

![Figure 1: Distribution of the sample depending on the pre-test tooth shade](image-url)
Table 1: Distribution of the sample according to the color change

<table>
<thead>
<tr>
<th>ColorChange</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest</td>
<td>11 (91.7%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Colgate</td>
<td>11 (91.7%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Signal</td>
<td>12 (100.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Lacalut Aktiv</td>
<td>9 (75.0%)</td>
<td>3 (25.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>43 (89.6%)</td>
<td>5 (%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

$X^2=4.242$, d.f.=3, p=0.237 (p>0.05)

Discussion

The present study included only third year dental students based on the availability during the actual study period and keeping in mind the future study compliance.

The present study was an in-vivo randomized clinical trial that evaluated the comparative efficacy of three different very popular toothpastes on the staining effect on the teeth. A chlorhexidine based toothpaste (Luculat Aktiv) was incorporated because of the increased public interest in the usage of alternative health care with more therapeutic efficiency. (11) The addition of antimicrobial agents to conventional toothpastes aims to increase effectiveness in the control or elimination of microorganisms involved in a wide variety of the primary etiological agents of dental caries. (12,13) However, there is not enough evidence about dentifrices with chlorhexidine. (14)

Teeth shade change may be influenced by both intrinsic and extrinsic coloration, being the latter determined by the adsorption of pigments onto the tooth substrate, causing staining. (15,16) Staining observed clinically may be the result of the precipitation of antiseptics, such as chlorhexidine, or of chromogenic dietary substances, such as tea. (17)

In spite of individual variation, the study did not find any change in shade after the use of all three commercial toothpastes in the majority of cases proving their clinical efficiency. This comes in agreement with Ghassemi et al. (18) who found similar results while using Colgate Cavity Protection Toothpaste for six weeks and with Koertge et al. (19) who found no significant tooth shade changes after using Crest Toothpaste for twelve weeks. The minor differences detected may be due to differences in enamel roughness, brushing frequency and technique or consumption of staining food. (20,21).

Three quarters of the subjects who brushed with Laculut Aktiv showed no shade changes and only one quarter showed a mild shade change. It is difficult to compare our findings with previous researches as most of them were carried out in vitro (16,22) or on bovine teeth. (23)

Ethical Clearance: The researchers already have ethical clearance from college of Dentistry, University of Baghdad

Source of Funding: Self funding

Conflict of Interest: No conflict of interest

REFERENCES


Analysis of Cyclamate Contents in Food/Beverages Snacks Sold in Several Primary Schools in Enrekang Regency

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¹Department of Health Analyst Poltekkes Makassar

ABSTRACT

Research has been carried out on the analysis of cyclamate content in snacks/snacks sold in several elementary schools in Enrekang Regency with the aim of analyzing cyclamate content in snacks/beverage samples both qualitatively and quantitatively. The method used in this study is the laboratory observation method with a descriptive approach, qualitative test with Gravimetric method and quantitative test with UV spectrophotometry. The results of the study from 28 samples contained 10 types of snacks and 18 types of snacks. Based on qualitative tests of 10 samples of all snack foods (100%), they were negatively contained cyclamate. Of the 18 samples of snack foods there were 6 (33.3%) samples stated to contain cyclamates and 12 (66.7%) samples stated as not containing cyclamates. From the results of the quantitative test, from 6 samples that were positive for cyclamate with levels of 24.92 - 100.33 mg/kg with an average value of 53.07 mg/kg with a standard deviation of 86.61, all of them still met the requirements according to the Head of the Agency Drug and Food Control is a maximum of 500mg/kg.

Keywords: Cyclamate, food, snacks, Enrekang

Introduction

Food and beverages are very important for humans because they are one of the basic needs for their survival. Foods and beverages that are consumed must be fulfilled by their nutritional needs, hygienic, and safe to avoid diseases. At present the food and beverage industry is growing rapidly, advances in food and beverage processing technology have produced products in the form of processed food and beverages. Food and beverages in addition to having a longer shelf life, practical, also have a color, taste, aroma, and texture that is better than natural foods and drinks.¹⁷ Artificial sweeteners which are now widely used in beverages are cyclamate, which is one of the sweeteners used by small traders and home industries that have a sweet taste without bitter taste. These sweeteners have a sweetness 30 times relatively large than the level of sweetness of sucrose with no calorific value which is usually said to be a nonnuritive sweetener felt for diabetics and obese sufferers. In various small industries, cyclamates are often used to replace sucrose or often we are familiar with sugar or cane sugar with the intention of lowering prices so that they are sold cheaply but the taste remains sweet.²⁰ Cyclamate has a good taste, especially with its sweetness, but the use of cyclamates must be limited because it can endanger health.

Every country has its own rules in limiting the amount of cyclamate consumption. In Indonesia cyclamic sweeteners are still allowed as long as they do not exceed the threshold determined in the decision of the Head of the Food and Drug Supervisory Agency of the Republic of Indonesia. Regarding the use of artificial sweetener food additives in food products Number: HK.00.05.5.1.4547 in 2004, that cyclamates are allowed in drinks and food with a maximum usage limit of 500 mg/kg. The WHO world health organization itself limits the daily consumption of safe cyclamate (ADI) is 11 mg/kg body weight.¹⁹

Based on this, researchers are interested in conducting research with the title Analysis of cyclamate content in snacks/snacks sold in several elementary schools in Enrekang Regency.
Research Method

A. Type of Research: This type of research is descriptive comparative which aims to determine the differences in cyclamate content in snack foods and snacks which are traded in several elementary schools in Enrekang Regency.

B. Population and Samples
1. Population: The population in this study were snacks and snacks that were traded in several elementary schools in Enrekang Regency.
2. Samples: The samples used in this study were snacks and beverages that were bought and sold in several elementary schools in 3 sub-districts, namely: Baraka District, Malua District, and Buntu Batu District, Enrekang District.
3. Sample Size: The number of samples obtained and used in this study were 28 samples consisting of 10 samples of snacks and 18 samples of snacks.
4. Sampling Techniques: The sampling technique in this study was Total sampling.

C. Place and Time of Research
1. Sampling place: Sampling sites were carried out in several elementary schools in 3 sub-districts namely Baraka District, Malua District, and Buntu Batu District, Enrekang District.
2. Inspection Place: This research has been carried out in the Chemistry Laboratory of the Makassar Health Polytechnic Department and the Makassar Health Laboratory Center.
3. Research Time: This research has been carried out:
   a. Sampling was carried out on 3 districts in several Enrekang District elementary schools from August 13, 2018 and September 13, 2018
   b. Laboratory checks are qualitative tests and quantitative tests are held on August 20, 2018 until October 10, 2018.

D. Research Variables:
1. The independent variables in this study were the types of snacks and beverages that were traded in several elementary schools in 3 districts of Enrekang Regency.
2. The dependent variable in this study is the content and cyclamate level.

E. Operational Definition
1. Analysis: Analysis is a method for determining whether or not there is and determining the level of cyclamate in a material.
2. Cyclamate: Cyclamate is an artificial sweetener which is often referred to as sweet juice which is widely used by food and beverage manufacturers as a sweetener.
3. Food/Beverage snacks: Food/Beverage Snacks are a type of soft food/drink produced by housewives or home industries that are traded on traditional markets or in crowded places such as in schools.

F. Work Procedure
1. Pre Analytical
   a. Preparation of tools and materials:
      Tools: Porcelain cup, erlenmeyer, analytic balance, volume pipette, separating funnel, stirrer, measuring flask, beaker, stopwath, waterbath, test tube, suction rubber, chamber chromatography, TLC plate, bottling device and UV-Vis spectrophotometer
      Material: Aquadest, solution of hydrochloric acid (HCl), solution of barium chloride (BaCl2) 10%, Solution of sodium nitrite (NaNO2) 10%, solution of 10% NaOH, sodium cyclamate,
      a. Sample preparation: Piped 100 ml of sample snacks and snacks into a measuring flask, then add 10% NaOH to alkalis. Filter using whatman filter paper (Apriyantono. A. et al.)
   2. Analytic: Ways of working:
      a. Making Standard Sodium Cyclamate Solution
         1. Making 1000 ppm cyclamate mother solution
            Weigh 0.1 grams of sodium cyclamate, dissolved in aquadest, put in a 100 ml volumetric flask, add aquadest to the boundary mark. Then homogenize.
         2. Making standard work solutions: Piped as much as 5 ml (50 ppm), 10 ml (100 ppm), 15 ml (150 ppm), 20 ml (200 ppm), 25 ml (250 ppm), 30 ml (300 ppm), 40 ml (400 ml). ppm, and 50 ml (500 ppm), then each is put in a 100 ml volumetric flask.
3. The absorbance is measured by a UV-Visible spectrophotometer at a wavelength of 420 nm.

b. Qualitative test for cyclamate deposition method
1. Pipette 100 ml of sample solution and inserted into the Erlenmeyer flask. Add aquaest to the boundary mark. Filter on whatman paper.
2. Add 10 ml of 10% HCl solution.
3. Add 10 ml of 10% BaCl2 solution, left for 30 minutes
4. If filter turbidity occurs, use paper whatman. Add 10% NaNO2 as much as 10 ml is done in the acid room.
5. Heat using a waterbath while homogenizing for 20 minutes until white sediment is formed. Then let it cool.
6. If white deposits arise from BaSO4, the sample contains cyclamate

c. Quantitative test spectrophotometer method
1. Pipette 100 ml of sample solution and inserted into the Erlenmeyer flask. Add aquaest to the boundary mark. Filter on whatman paper.
2. Add 10 ml of 10% HCl solution.
3. Add 10 ml of 10% BaCl2 solution, left for 30 minutes.
4. If filter turbidity occurs, use paper whatman. Add 10% NaNO2 as much as 10 ml to do in the acid room.
5. Heat using a waterbath while homogenizing for 20 minutes until white sediment is formed. Then let it cool.
6. The absorbance is measured by a UV-Visible spectrophotometer at a wavelength of 420 nm.

3. Post Analytic: Calculation of cyclamate levels
Calculation of cyclamate content is done by using a linear equation, a graph is made between absorption and concentration for cyclamate, where the absorption values on the Y axis and concentration on the X axis, then drawn lines between points to obtain a straight line equation.

\[ Y = a + bx \]

G. Data Analysis: Data that has been collected from the results of the study will be presented in table form and described in narrative form.

Results and Discussion

A. Research Results: Based on the results of laboratory examinations which were held on August 20, 2018 to October 10, 2018 which were held at the Makassar Health Laboratory Center, the following results were obtained:

Table 1: Distribution of snack foods based on the results of qualitative tests of Siklamat content traded in several Primary Schools in Enrekang Regency

<table>
<thead>
<tr>
<th>No.</th>
<th>Snack Foods</th>
<th>(n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Positive</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>Negative</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 2018 primary data

From table 1 above shows that of the 10 types of snacks that are traded in several elementary schools in Enrekang Regency, they are all negatively containing cyclamates.

Table 2: Distribution of snack drinks based on the results of qualitative tests of Siklamat content traded in several Primary Schools in Enrekang Regency

<table>
<thead>
<tr>
<th>No.</th>
<th>Snack Foods</th>
<th>(n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Positive</td>
<td>6</td>
<td>33,3</td>
</tr>
<tr>
<td>2.</td>
<td>Negative</td>
<td>12</td>
<td>66,7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 2018 primary data

From table 2 above, it shows that of the 18 types of snacks sold in several elementary schools in Enrekang Regency, 6 (33.3%) were positively cyclamate, and 12 (66.7%) were negative in cyclamate.

Table 3: Distribution of snack drinks based on the results of quantitative tests of Siklamat content traded in several primary schools in Enrekang Regency based on POM Head (500 mg/kg)

<table>
<thead>
<tr>
<th>No.</th>
<th>Cyclamate content (mg/kg)</th>
<th>(n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&lt; 100</td>
<td>4</td>
<td>66,7</td>
</tr>
<tr>
<td>2.</td>
<td>100 - 500</td>
<td>2</td>
<td>33,3</td>
</tr>
<tr>
<td>3.</td>
<td>500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 2018 primary data
From table 3 above shows that of the 6 types of snack drinks that contain positive cyclamates, the lowest results are <100 mg/kg as much as 4 (66.7%), between 100-500 mg/kg as much as 2 (33.3%) and > 500 mg/kg = 0.

Table 4: Distribution of snack drinks based on the results of quantitative tests of Siklamat content traded in several primary schools in Enrekang Regency according to Head of POM (500 mg/kg)

<table>
<thead>
<tr>
<th>No.</th>
<th>Snack Drinks</th>
<th>(n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>High</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 2018 primary data

From table 4 above shows that of the 6 types of snack drinks traded in several elementary schools in Enrekang Regency, all of them are still within safe limits based on the Head of the POM Agency.

Table 5 : Results of Average, Standard Deviation (SD) counts of snacks based on the results of quantitative tests of cyclamate content traded in several elementary schools in Enrekang Regency

<table>
<thead>
<tr>
<th>No.</th>
<th>Snack Drinks</th>
<th>Average</th>
<th>Standard Deviation (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>53.25</td>
<td>86.61</td>
</tr>
</tbody>
</table>

Based on table 5 above, it shows that from 6 samples of snack drinks that contain positive cyclamates, the average number of cyclamate levels is 53.25 mg/kg sample with a standard deviation value of 86.61.

B. Discussion: Cyclamic sweetener is one type of artificial sweetener or synthetic sweetener which is a type of sweetener that has a sweet taste 30 times relatively large from the sweetness level of sucrose with no caloric value.

In various small industries, cyclamates are often used to replace sucrose or often we are familiar with sugar or cane sugar with the intention of lowering prices so that they are sold cheaply but the taste remains sweet. Cyclamate has a good taste, especially with its sweetness, but the use of cyclamates must be limited because it can endanger health. The result of cyclamate metabolism which is often called cyclohexamin is carcinogenic so that excretion through urine can stimulate tumor growth.

In Indonesia cyclamic sweeteners are still allowed as long as they do not exceed the threshold determined in the decision of the Head of the Food and Drug Supervisory Agency of the Republic of Indonesia. Regarding the use of artificial sweetener food additives in food products Number: HK.00.05.5.1.4547 in 2004, that cyclamates are allowed in drinks and food with a maximum usage limit of 500 mg/kg.

Based on the results of the research for the qualitative test with Thin Layer Chromatography (TLC) method, all 10 food samples did not contain cyclamates, whereas for the snack beverage samples it was found that from 18 snacks samples obtained 6 types of cyclamate samples. Snack drinks sold in several elementary schools in Enrekang Regency, found 6 (21.4%) samples that tested positive for cyclamic sweeteners and 12 (78.6%) samples of snacks that did not contain cyclamates. Of the 6 samples that contained positive cyclamates after being tested with quantitative tests of ultra-violet (UV) spectrophotometric methods, the results were: 24.92 mg/kg, 28.0 mg/kg, 32.54 mg/kg, 32.45 mg/kg, 100.27 mg/kg, and 100.33 mg/kg. This means that from 6 samples not exceeding the standards set by the Head of the Republic of Indonesia Drug and Food Supervisory Agency, which is a maximum of 500mg/kg. Based on these results, the cyclamate level obtained in snacks sold in several bases in Enrekang Regency is between 25.92 mg/kg - 100.33 mg/kg with an average value of 53.07 mg/kg with a standard deviation value (SD) as many as 86.61.

According to the head of the Food and Drug Supervisory Agency (BPOM) said that the safe limit of cyclamate use in snacks or snacks is 500mg/kg, meaning that of the 6 samples of snacks sold in some elementary schools in Enrekang District that are positively cyclical still safe for consumed.

Conclusions and Suggestions

A. Conclusion: Based on the results of the research and discussion about the Analysis of Cyclamate content in snacks/Beverages that are traded in several elementary schools in Enrekang Regency can be concluded as follows:
Based on the results of qualitative analysis of Thin Layer Chromatography (TLC) method, it was found that from 28 types of samples there were 10 samples of types of snacks and 18 samples of types of snacks.

2. Snack food samples from 10 types were stated to be all negative containing cyclamate.

3. Samples of snack drinks from 18 samples obtained 6 (33.3%) samples containing positive cyclamates, and 12 (66.7%) samples did not contain cyclamates.

4. Based on the results of quantitative analysis of the spectrophotometric method, from 6 samples that contain positive cyclamate, all of them are still within the standard limits permitted by the Head of the Republic of Indonesia Drug and Food Supervisory Agency, which is a maximum of 500mg/kg.

B. Suggestions: Based on the results of research and discussion it can be suggested as follows:

1. For the community, it is still advisable to pay attention to snacks/drinks that will be consumed.

2. For household industries to always pay attention to the safety of snacks/snacks sold.

Conflict of Interest: None

Ethical Clearance: From ethical committee at Department of Health Analyst Poltekkes Makassar

Source of Funding: Self

REFERENCES


Hygiene and Sanitation Management of Drinking Water Refill Depots for Feasibility Consumption in Kendari City, Indonesia

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ABSTRACT

Aim: Safe and healthy drinking water is drinking water by which has well controlled and maintained hygiene sanitary. This study aims at investigating the sanitation and hygiene of drinking water found in several refill drinking water depots in Kendari City, Southeast Sulawesi Province, Indonesia.

Method: Selecting the sample was done randomly with a total 32 samples of drinking water refill depots scattered in Kendari City. Data collection uses questionnaires as stated in the Regulation in the Republic of Indonesia’s Minister of Health Regulation No. 492/Menkes/Per/IV/2010 concerning on drinking water quality requirements which includes aspects of premises, equipment and handlers.

Results: The results of the research is hygiene and sanitation conditions in 32 refill drinking water depots scattered in Kendari City showed 66.33% met the eligibility requirements and 33.26% were not feasible. For the parameters of the equipment used in the refill drinking water depots, it is as much as 92.75% meet the eligibility requirements and 5.40% are not feasible, while for the hygiene and sanitation conditions of the handlers, as much as 52.68% are eligible and 47.37% are not feasible.

Conclusion: Hygiene and sanitation requirements in the management of drinking water are very important to prevent the incidence of spreading diseases caused by water and sanitation. Hygiene and sanitation of drinking water refill depots will be able to control infectious diseases and can provide protection to consumers so as to ensure human safety and health.

Keywords: Hygiene, Sanitation, Management of Drinking Water, and Refill Depots

Introduction

Safe drinking water is a very basic need for human life.¹² Accessibility and availability of safe drinking water plays an important role in economic development and human health.³ Drinking water contamination is a serious threat that will cause problems for human life.⁴ Pollution of drinking water is mainly caused by microorganism, organic matter and disinfectants that affect the quality of drinking water and cause disruption to human health.⁵ Therefore, the availability of safe and health drinking water is a challenge faced by the world today.

Refill drinking water quality continues to be a concern as it relates to public health and when it is contaminated, it would be the media spread of infectious diseases that can cause death.⁶ Sanitary and hygienic drinking water is one of the prerequisites for improving the quality of drinking water produced and can provide health security and safety to consume.¹ However, the hygiene and sanitation of drinking water is still a problem that is overlooked. This condition contributes to the high diarrheal diseases listed in Kendari. The survey results in one of the health centers in Kendari city in 2013 that there were 2.915 cases of diarrhea and in 2015, it is recorded 529 cases of the diarrhea disease.⁷ Therefore, it is required periodic monitoring and improvement of drinking water quality management in order to improve public health. In Kendari city, drinking water distributed by several companies of refill drinking water depot and most of them apply hygiene and standard sanitation of drinking water for water safety before distributing to consumers.

Several previous studies have shown that the hygiene and sanitation of drinking water refill depot that is not managed properly can become a medium for
spreading and infectious diseases, as reported in Afrika,
Mali, Bangladesh, and some European countries. If the hygiene and sanitation of drinking water refill depot knowable, then counseling about drinking water sanitation and hygiene management can be approved to maintain the quality of safe drinking water produced.

Although several studies on hygiene and sanitation have been conducted in various countries, such as USA, UEA, Bangladesh, India, Malaysia, and some areas in Indonesia, hygiene sanitary evaluation of drinking water in Kendari, Indonesia still has not been widely publicized. The purpose of this study was to investigate hygiene and sanitation of drinking water refill depot in producing potable drinking water.

**Materials and Method**

This study is a descriptive study conducted to provide an overview of sanitary and hygienic refill drinking water depot with parameters of premises, equipment, and healthy life of refill drinking water depot handler. This research was conducted at several places in Kendari from March to August 2018. Year Determination of the number of samples is done randomly by the number of 32 samples of drinking water refill depots scattered in Kendari. The data collection used questionnaire as contained in the Minister of Health 492/Menkes/Per/IV/2010 concerning on the quality requirements of drinking water in Indonesia.

**Results**

1. Place Water Sanitation Hygiene Refill: Most of refill drinking water depot in Kendari, owned by an individual business with the service’s reach limited to the area around the place of business. Results observation sanitary hygienic refill drinking water are presented in the following table.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>F</th>
<th>%</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Location is free from pollution and disease transmission</td>
<td>30</td>
<td>93,75</td>
<td>2</td>
<td>6,25</td>
</tr>
<tr>
<td>2</td>
<td>The building is strong, safe, easy to clean and easy to maintain</td>
<td>31</td>
<td>96,88</td>
<td>1</td>
<td>3,13</td>
</tr>
<tr>
<td>3</td>
<td>The floor is water resistant, the surface is flat, smooth, not slippery, does not crack, does not absorb dust, and is easy to clean, and has a gentle slope</td>
<td>30</td>
<td>93,75</td>
<td>2</td>
<td>6,25</td>
</tr>
<tr>
<td>4</td>
<td>The walls are waterproof, the surface is flat, smooth, not slippery, does not crack, does not absorb dust, and is easy to clean, and has bright colors</td>
<td>29</td>
<td>90,63</td>
<td>3</td>
<td>9,38</td>
</tr>
<tr>
<td>5</td>
<td>Roofs and ceilings must be strong, rat repellent, easy to clean, do not absorb dust, flat surfaces, and light colors, and have enough height</td>
<td>30</td>
<td>93,75</td>
<td>2</td>
<td>6,25</td>
</tr>
<tr>
<td>6</td>
<td>Spatial planning consists of processing, storage, distribution/provision space, and visitor/consumer waiting rooms</td>
<td>24</td>
<td>75,00</td>
<td>8</td>
<td>25,00</td>
</tr>
<tr>
<td>7</td>
<td>Lighting is bright enough to work, not dazzling and evenly distributed</td>
<td>31</td>
<td>96,88</td>
<td>1</td>
<td>3,13</td>
</tr>
<tr>
<td>8</td>
<td>Ventilation guarantees good air circulation</td>
<td>28</td>
<td>87,50</td>
<td>4</td>
<td>12,50</td>
</tr>
<tr>
<td>9</td>
<td>Air humidity can provide comfort in doing work/activity</td>
<td>28</td>
<td>87,50</td>
<td>4</td>
<td>12,50</td>
</tr>
<tr>
<td>10</td>
<td>It has an access to the bathroom and toilet</td>
<td>7</td>
<td>21,88</td>
<td>25</td>
<td>78,13</td>
</tr>
<tr>
<td>11</td>
<td>There is a sewerage sewer that has smooth and closed flow</td>
<td>14</td>
<td>43,75</td>
<td>18</td>
<td>56,25</td>
</tr>
<tr>
<td>12</td>
<td>There is a closed trash bin</td>
<td>4</td>
<td>12,50</td>
<td>28</td>
<td>87,50</td>
</tr>
<tr>
<td>13</td>
<td>There is a hand washing area with running water and soap</td>
<td>4</td>
<td>12,50</td>
<td>28</td>
<td>87,50</td>
</tr>
<tr>
<td>14</td>
<td>Free from rats, flies and cockroaches</td>
<td>9</td>
<td>28,13</td>
<td>23</td>
<td>71,88</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td></td>
<td>66,74</td>
<td>33,26</td>
<td></td>
</tr>
</tbody>
</table>

It is found that 2 depots of refill drinking waters’ roofs and ceilings are inadequate since the constructions are not strong, do not closed perfectly, the surfaces are uneven, dark in color, difficult to clean and allow rat to enter the processing room. However, all refill drinking water depots in Kendari already have several air vents. Nevertheless, only some refill drinking water depots meet the requirements, for instance, building sanitation and hygiene conditions include access to bathrooms and latrines, sewerage drains, closed trash cans, hand washing places equipped with running water, and buildings that are free of rats, flies and cockroaches (Table 1).
2. Drinking Water Sanitation Hygiene Tool Refill

Tabel 2: Hygiene and sanitation of refill drinking water in Kendari city

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Qualify</th>
<th>Not Eligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The equipment used is made from foodstuffs</td>
<td>31 96,88</td>
<td>1 3,13</td>
</tr>
<tr>
<td>2</td>
<td>Microfilter and disinfection equipment are still in their use/not expired</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>3</td>
<td>Standard water reservoirs must be covered and protected</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>4</td>
<td>Gallon container before cleaning is done</td>
<td>31 96,88</td>
<td>1 3,13</td>
</tr>
<tr>
<td>5</td>
<td>Cleansing Containers/gallons that have been filled with drinking water must be given directly to consumers and should not be stored in DAM for more than 1x24 hours</td>
<td>26 81,25</td>
<td>6 18,75</td>
</tr>
<tr>
<td>6</td>
<td>Performing a reverse washing system (back washing) periodically replaces the macro filter tube.</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>7</td>
<td>There are more than one micro filter (µ) with tiered size</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>8</td>
<td>There is sterilization equipment, in the form of ultra violet and/or ozonation and/or other disinfection equipment that functions and is used correctly</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>9</td>
<td>There is a bottle washing and flushing facility (gallon)</td>
<td>29 90,63</td>
<td>3 9,38</td>
</tr>
<tr>
<td>10</td>
<td>There is a bottle filling facility (gallon) in a closed room</td>
<td>26 81,25</td>
<td>6 18,75</td>
</tr>
<tr>
<td>11</td>
<td>New clean bottle caps are available</td>
<td>30 93,75</td>
<td>2 6,25</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>94,60</td>
<td>5,40</td>
</tr>
</tbody>
</table>

3. Hygiene Officer Water Refill: Results of this study found that the involvement of workers who assist the refill drinking water depot on average employ at least 2-3 people with an area of buildings used as places of business ranging from 5 m² to 70 m². Observation conducted on sanitary hygienic cleanliness handlers include uniforms, using of headgear, the use of aprons, and the use of muzzles to clean nails. It is also seen handlers behaviors such as hand washing, spitting, talking, eating and drinking, smoking, and scratching during work. The hygiene and sanitation observation result in table 3.

Table 3: The handler/operator condition of refill drinking water depot in Kendari

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Qualify</th>
<th>Not Eligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Healthy and free from infectious diseases</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>2</td>
<td>Not being a carrier of germs</td>
<td>32 100,00</td>
<td>0,00</td>
</tr>
<tr>
<td>3</td>
<td>Hygiene and sanitation behavior every time serving consumers</td>
<td>28 87,50</td>
<td>4 12,50</td>
</tr>
<tr>
<td>4</td>
<td>Always wash hands with soap and water flowing every time in serving consumers</td>
<td>24 75,00</td>
<td>8 25,00</td>
</tr>
<tr>
<td>5</td>
<td>Using clean and neat work clothes</td>
<td>2 6,25</td>
<td>30 93,75</td>
</tr>
<tr>
<td>6</td>
<td>Conduct regular health checks at least 1 (one) time a year</td>
<td>0,00</td>
<td>32 100,00</td>
</tr>
<tr>
<td>7</td>
<td>The operator/person in charge/owner has a certificate for taking hygiene sanitation courses at the drinking water depot</td>
<td>0,00</td>
<td>32 100,00</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>52,68</td>
<td>47,32</td>
</tr>
</tbody>
</table>

Health checks are necessary to prevent contamination of the drinking water produced when employees have a disease that can be transmitted through the air. Therefore, it needs necessary guidance through relevant agencies to increase awareness and knowledge officer of depot refill drinking water to improve the safety of drinking water produced, because even though the condition of sanitary hygienic premises and equipment are eligible
not necessarily produce drinking water that is safe to eat if the hygiene and sanitation handlers/operator do not meet the standards of drinking water management. This is because the handlers/operators are in direct contact with drinking water produced and could potentially be a source of contaminants.

Discussion

Assessment of the quality of drinking water is a great way to ensure the risk of spreading disease through air. This research conducted in Kendari city which aims to measure hygiene sanitation of drinking water produced with a focus on the observation of sanitary premises, equipment and operators. This study is an exploratory study that contributes to a portrait of hygiene and sanitation program undertaken management of refill drinking water depot in ensuring the quality of drinking water production. This is due to the spread of diseases, pathogens and other infectious diseases is largely determined by improving hygiene in sanitation and hygiene measures undertaken by the management of refill drinking water depot.

The findings of this study indicate that the sanitation hygiene of 32 refill drinking water depots in Kendari seems not ideal. This is because only around 66.33% meets the eligibility requirements, while 33.26% has not fulfilled the eligibility requirements. Management of a good place will reduce the risk of transmission of the disease, letting the place that is not hygienic will be a medium for disease spreading so that the water produced becomes unsafe for consumption and increases the risk of infection that can cause death. For hygiene sanitation of the place, the following components contribute to sanitation hygiene which are not massive, such as: (1) unavailability of bathroom and latrine access (2) no closed trash can, (3) no hand washing area equipped with water flow and soap, and (4) not free from rats, cockroaches and flies.

The safety of drinking water equipment is very important in supporting human health, since if the equipment used does not meet water health standards so that it can reduce health benefits for those who consume it. The quality of equipment used makes an important contribution to the quality of drinking water produced, because with equipment that meets the appropriate safety standards, it will guarantee the people who consume the drinking water produced. While the parameters of the handler/operator of drinking water management are 52.68% that fulfilled the requirements and 47.32% which did not meet the requirements.

Based on the data described above, it appears that supervision of drinking water sanitation hygiene towards refill drinking water depots must be carried out continuously and scheduled in order to reduce the amount of pollutants and can provide health benefits for the drinking water production by carrying out continuous and scheduled monitoring of refill drinking water depots which include places, tools and handlers/operators. It will reduce the rate of pathogen/pollutant release into drinking water, as well as minimize the spread of disease among consumers and improve the quality of drinking water so it is safe for consumption.

Ethical Clearance: Taken from institution of Mandala Waluya Ethical committee

Source of Funding: Self

Conflict of Interest: None

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Assessing the Risk Factors for Diabetes Retinopathy Patients in Al-Nasiriya City, Iraq

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ABSTRACT

Context: The World Health Organization estimates that by 2030, Iraq will have 2,009,000 new case of diabetes.

Aim: To assess the risk of diabetic retinopathy (DR) among diabetes patients in Al-Nasiriya city, Southern Iraq.

Methodology: A study of cases and controls was presented with a total of 220, of them 110 cases and 110 control. Patients with Diabetes mellitus (DM) attending follow-up check-ups regularly at diabetes and endocrinology center in Nasiriya city from the period March 1, 2018 to May 31, 2018 were considered as our study population. Chi-square tests is applied to analyze the association between visual impairment and risk factors, in addition multivariate logistic regression is used to explore odds ratio and 95% confidence interval for the association among visual impairment and risk factors. p<0.05, identified as statistically significant.

Results: Factors such as age, gender, educational level, BMI, family history, hypertension, treatment type and glycemic control which showed a significant association between cases and control on DR. The significant factors influencing DR were analyzed in multivariate logistic regression. We observed secondary education level, BMI, family history, treatment type and glycemic control occurred as significant independent risk factors for the incidence of DR.

Conclusion: Our analysis reflect the necessity of prevention of the identified risk factors, which appears in our findings. Our study endorsed that a population based study can be conducted in future to examine the risk factors in different parts of Iraq to provide accurate data on the cause of DR and predict the correct result.

Keywords: Association, Diabetics Mellitus, Diabetic Retinopathy, Risk Factors, Visual Impairment

Introduction

In 2035 worldwide it is estimated that 592 million of people with diabetics mellitus (DM) were observed under the age group 20-79.¹ The general pervasiveness of diabetes in Iraq was 21.8 for each 1000 in 2007. The World Health Organization (WHO) estimates that by 2030, Iraq will have 2,009,000 new case of diabetes. ² In 1999, WHO organized a vision 2020 program to reduce the preventable blindness globally by 2020 and discussed the cause and trends of visual impairment.³ By 2020 it has been estimated that the prevalence of visual impairment would be double, if the necessary actions to reduce about 80% reasons of preventable visual impairment are not taken.⁴ From late 1970’s, only very few literature revealed the incidence and prevalence of diabetic retinopathy (DR) in persons with DM.⁵

One of the major feared disabilities that a common person can suffer is visual impairment. Persons with DM observe DR and visual impairment as the most awful problem of diabetes, since they cannot achieve or
DM patients are at higher risk of developing ocular impairment which changes the retina and blindness that leads to an eye complication i.e. DR.[8] It’s a microvascular complications of DM influence the small blood vessels that connect eye’s veins to arteries, it occur secondary due to elevation of blood sugar and consider as the most important cause for impairment of vision and blindness in diabetes patients. Over one third of DM patients will develop some form of DR in their lifetime and the risk increase with duration and uncontrolled diabetes.[9,10] Management of DM should not only depended on reduction of blood glucose level but also should concentrate on monitoring and treatment of any associated risk factors such as hyperlipidemias, smoking, obesity and treatment hypertension. The prime motifs of diabetes treatment are identified as diet with exercise, oral hypoglycemic therapy and insulin treatment because the previous factors have an important role on the occurrence of DR.[11,12] Therefore, this research aim to assess the risk of DR among diabetes patients in Al-Nasiriya city, Southern Iraq.

Materials and Method

A study of cases and controls was presented with a total of 220, of them 110 cases (with eye diseases related to diabetes) and 110 control (without eye diseases related to diabetes). Patients with DM (Type 1 or Type 2) attending follow up check-ups regularly at diabetes and endocrinology center in Nasiriya city from the period of 1 March 2018 to 31 May 2018 were considered as our study population. Among the study population, those who suffered from DM with the age group of 35 years and above were included in this study. Besides, an ethical clearness and approval were taken from each patient prior to the commencement of the study.

Definition of DM: DM is a metabolic trouble characterized by entire (Type 1) or proportional (Type 2) insulin deficiency.[13] Type 1, DM is known as insulin-dependent DM or adolescent beginning diabetes. It represents around 5% of all cases of diabetes. Type 2, DM also named as non-insulin dependent DM or adult-onset diabetes is the most widely recognized type of DM, which accounts for 90% to 95% of every diabetic patient.[14]

Data Collection

A closed questionnaire method was investigated by the first author. We collected the information on socio-demographic (age, gender, education level) which is first part of data collection. Associated conditions of DR (smoking, Body mass index (BMI), diabetic type, family history, duration, hypertension, treatment type, glycemic control) constitutes the second part of data collection. BMI was measured as weight kg/height m². The patients were classified into subgroups according to WHO BMI measures as underweight (<18.5 kg/m²); normal weight (18.5-25 kg/m²) and overweight (25.00-29.99 kg/m²).[15]

Statistical Analysis: In this study, Chi-square tests is analyze the association between visual impairment and risk factors (age, gender, education, smoking, BMI, diabetic type, family history, duration, hypertension, treatment type and glycemic control). In addition, multivariate logistic regression analysis is used to explore odds ratio (OR) and 95% confidence interval (CI) among visual impairment (dependent variable) and risk factors. p<0.05 (two tailed), identified as statistically significant. All statistical tests were done using the software Statistical Package of Social Science (SPSS) IBM version 20.

Results

The results on descriptive characteristics of study sample and chi-square tests were reviewed and described as follows. With regard to age group, 41.8% of cases and 43.6% of control are observed between the age of 55-64 years. A significant association (p<0.05) was observed between cases and control with regard to age group. The gender wise distribution indicated that 46.4% of cases and 67.3% of control are males. The association between cases and control is found statistically significant with respect to gender (p<0.05). The Majority of study sample from control 60% are belonged to university group and 40% from case are illiterate. Furthermore, there is a significant association between education level and DR (p<0.05). In case of smoking status, no statistical association (p>0.05) is observed between cases and control. Besides, 61.8% of cases 67.3% of
control are observed non-smokers. When reviewing the results related to BMI, the majority of study cases group was observed as normal weight (53.6%) whereas the majority of control group observed as overweight (75.5%), a significant association between BMI and DR is observed (p<0.05).

Moreover, a significant association (p>0.05) is found between cases and control with respect to the type of diabetics and 91.2% cases and 85.5% control were presented under type 2 diabetic. With regard to family history of DR 73.6% of cases and 50.9% of control had family history of DR. There is a statistical significant association between cases and control (p<0.05). The duration of DR reveal that higher percentage of 57.3% cases and 51.8% control were found with above 10 years, while lower percentage was observed in patient having less than 5 years. However, the association between duration type and DR was found as non-significant (p>0.05). Oral intake of insulin as treatment was observed in 65.5% of cases and 85.5% control. Results showed that there is a statistically significant association between cases and control (p<0.05). Oral intake of insulin as treatment was observed in 65.5% of cases and 85.5% control. Results showed that there is a statistically significant association between cases and control (p<0.05). Older induction of insulin as treatment was observed in 65.5% of cases and 85.5% control. Results showed that there is a statistically significant association between cases and control (p<0.05).

Furthermore, the factors such as age, gender, educational level, BMI, family history, hypertension, treatment type and glycemic control which showed a statistically association between cases and control were analyzed to find out their statistical significant influence on DR using multivariate logistic regression model. The significant factors influencing DR were identified based on the values of odd ratio (OR), confidence interval (CI), Wald value and p-value in multivariate logistic regression model [Table 1]. Results showed that age group of 45-54 years (CI of 0.005-1.637) had 0.086 times of higher risk of prevalence evolving DR (Wald=2.664, p>0.05) when compared to other age groups, however all age groups showed non-significant. In education level, primary education showed 17.324 (CI of 3.264-69.436) times of higher risk of evolving DR (Wald=6.913, p>0.05), but only secondary education is found to be significant on evolving DR. BMI and Family history were identified as the main risk factor with (p<0.005), the OR showed a high risk value in multiple logistic regression. Treatment type and glycemic control seemed to be a statistically significant risk factor for the incidence of DR. The OR was very less with statistically significant. However, the gender showed no statistical significance on evolving DR (Wald=0.622, p>0.05) with OR=0.377 (CI of 0.033-4.261). Likewise, hypertension was not found to produce statistically significance on evolving DR (Wald=0.045, p>0.05). Therefore, secondary education level, BMI, family history, treatment type and glycemic control occurred as significant independent risk factors for the incidence of DR.

Table 1: Demographic characteristics and other attributes: Multivariate logistic regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Odds ratio (95%CI)</th>
<th>Wald</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35-44</td>
<td>.012 (0.009-1.537)</td>
<td>3.187</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>45-54</td>
<td>.086 (0.005-1.637)</td>
<td>2.664</td>
<td>0.103</td>
</tr>
<tr>
<td></td>
<td>55-64</td>
<td>.079 (0.006-1.127)</td>
<td>3.505</td>
<td>0.061</td>
</tr>
<tr>
<td></td>
<td>Above 65</td>
<td>References</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>.377 (0.033-4.261)</td>
<td>0.622</td>
<td>0.430</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>References</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td>Illiterate</td>
<td>5.994 (0.534-67.346)</td>
<td>2.105</td>
<td>0.147</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>17.324 (3.264-69.436)</td>
<td>6.913</td>
<td>0.269</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>9.444 (1.099-81.152)</td>
<td>4.186</td>
<td>0.041*</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>References</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>Under weight</td>
<td>22618.5 (187.12-2734100.78)</td>
<td>16.798</td>
<td>0.000*</td>
</tr>
<tr>
<td></td>
<td>Normal weight</td>
<td>6462.56 (109.85-380199.21)</td>
<td>17.811</td>
<td>0.000*</td>
</tr>
<tr>
<td></td>
<td>Over weight</td>
<td>References</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this study the factors influencing the prevalence of DR such as age, gender, educational level, smoking, BMI, diabetic type, family history, duration, hypertension, treatment type and glycemic control were examined. In our study age, gender and hypertension were not found as significant risk factor for DR. Our study revealed that prevalence of DR tend to increase with increasing level of education (p<0.05). It is observed that the patients having secondary education are more likely to have retinopathy when compared to those who are illiterate and having primary education and these patients are also likely to be unemployed, thereby unable to afford the eye care service. The findings of our study is consistent with the results of previous studies.\textsuperscript{[16,17]} In our study, BMI showed a significant association with DR as underweight and normal weight are the main risk factors for DR. Likewise, several other studies have found an association between DR and BMI presence.\textsuperscript{[18,19]} Karter et al.\textsuperscript{[20]} identified in north California that the majority of population had a family history of DM. In our study, family history showed a statistically significant association with DR, this findings is consistent with the study by Le et al.\textsuperscript{[21]} Treatment type with oral and insulin showed a significant association with DR, which agreed with the results of El-Haddad and Saad.\textsuperscript{[22]} Our study showed that the 14.5% of control had the insulin injection, this result is in accord with the results of McCarty et al.\textsuperscript{[23]} A study by Katulanda et al.\textsuperscript{[24]} in Sri Lanka stated that the prolonged coverage of population with hyperglycemia as a risk factor for complications in DR. This could explain the significant association between glycemic control and DR observed in our present study, and the previous studies also highlighted the same association.\textsuperscript{[25,26]}

### Conclusion

Our analysis reflect the necessity of prevention of the identified risk factors, which appears in our findings as education level, BMI, family history, treatment type and glycemic control. Our results focused the growing urgency of DR prevention in the study area as well as the necessity for awareness. Our study endorsed that a population based study can be conducted in future to examine the risk factors in different parts of Iraq to provide accurate data on the cause of DR and predict the correct result.

### Conflicts of Interest:
There are no conflicts of interest.

### Source of Funding:
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### Declaration:
We declared that this article is an original work and has not been sent to any other journal for publication.

### References


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The Principle of Lived Body Experience of Public Safety Center (PSC) 119 Officer in Conducting Integrated Emergency Response Systems in Malang, East Java, Indonesia

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ABSTRACT

Background: The officer of PSC (Public Safety Center) 119 in Malang is spearheading of health services outside of hospital. PSC officer was expected to remain on duty well even though they are faced with problems related to educational background and infrastructure.

Objective: This study aimed to explore the sense of physical and psychological experiences (lived body) from PSC 119 officer in carrying out Integrated Emergency Response Systems in Malang.

Method: This study was qualitative research with an interpretive phenomenological approach and data analysis using IPA (Interpretative Phenomenological Analysis).

Results: Themes that found were based on lived body principle included grateful to be a member of PSC, love of working in helping others, and proud of being a member of the PSC.

Conclusion: The officer of PSC 119 Malang did not only work physically but also bring a positive emotional dimension in helping patients of pre-hospital emergency.

Keywords: Experience, PSC officer, SPGDT

Introduction

The government of Indonesia develops a program for the safety of community that known as Safe Community Program (SCP) in 2000. The aim of this program is to provide health care for people in the towns and villages(1). The kind of SCP implementation was application of Emergency Ambulance (EA) 118 that conducted in 18 cities, including Jakarta, Palembang, Yogyakarta, Surabaya, Makassar, Denpasar, and Malang(2). The implementation of EA only serves approximately 5 years. The obstacle of AE system included the lack of financial support from the government, the public would have to pay if they want to use the service and the increasing prevalence of infectious diseases, thus the government prioritize in this case(2).

Indonesia does not have an integrated pre-hospital service for 10 years, thus the government established the Regulation of Minister of Health number 19 in 2016 about Integrated Emergency Response Systems called as Sistem Penanggulangan Gawat Darurat Terpadu (SPGDT)(3). SPGDT implemented by establishing the National Command Center (NCC) in the Ministry of Health and Public Safety Center (PSC) in each district and town with call center number 119(4). The early establishment of PSC 119 service has been implemented in 27 locations across the island of Java(5).

Malang is the second largest city located in East Java, and being the largest city in Indonesia according to their population. Malang is also the second largest city in the southern part of Java island after Bandung(5). Malang has had PSC 119 since June 22, 2017 that consisted of 10 members. The result of interviews with PSC 119 officer Malang obtained three main phenomena. First, the PSC 119 members consisted of 2 health workers and 8 others are commoner. Second, the recruitment process of PSC 119 officer is not conducted in a series of tests. Third,
the officer of PSC 119 who has helped traffic accidents victims revealed the feelings of panic and fear in helping victims due to the lack of educational background and infrastructure.

The existence of human is consisted of four basic structures that known as “existentials”, they are lived space/spatiality, lived body/corporeality, lived time/temporality, and lived relationship/relationality. Existential help the human to develop as an approach to explore the experiences that experienced such as the human is exist in the world in terms of time, space, body, and relationships with other human beings. Lived body in phenomenology has the sense that the human being in the world physically and psychologically. Physical presence reveals something about us and unconsciously we always hide things at the same time(6).

Method

The methodology of this research used an interpretive phenomenological approach that developed by Heidegger (1962). This study was emphasized the deeper interpretation of relevant experience and not only described a person(7). The sample selection using purposive sampling based on inclusion criteria. There were five PSC 119 officers who met the criteria and were willing to be a participant. Data collection used in-depth interviews and data analysis used IPA (Interpretative Phenomenological Analysis)(8).

Findings

Data of study result analyzed by using IPA which consisted of six steps, they were reading and re-reading, initial noting, developing emergent themes, searching for connection a cross emergent themes, moving the next cases, and looking for patterns across cases(9). The analysis data result from five participants that related with lived body experience of the PSC 119 officer in implementing SPGDT in Malang obtained three themes, they were:

Grateful to be a member of PSC: Grateful according to Indonesian dictionary has the meaning of gratitude, giving thanks. Context grateful in this regard was the grateful of participant for the work they had. This theme was made up of three sub-themes, they were self-gratitude, thankful for the work situation, and gain the trust of co-workers.

The first sub-theme was self-gratitude, it was expressed by participants in the statement:
“... I’m so grateful to be one of the member of PSC...” (P1)
“... I’m very happy all the time (elected to be the member of PSC) and I’m so glad of all because I don’t want to lie to my conscience that I’m a social person. I like working in social field ...” (P3)

The second sub-theme that was thankful for the work situation. It expressed by participants such as:
“... I feel this is my place (PSC) because I’m easily to feel bored. The point is I get easily bored and don’t get tied. That means, if the work is monotonous, I get bored quickly. When passing the first month to the second months I feel PSC is my place...” (P4)

The third sub-theme gained the trust co-workers. The following was the statement of participant:
“... Department of Health may have already known our performance in the field. Our speed in the field, how to help people...” (P5)

“... yes I’m so grateful, but also we don’t know about the assessment of leader on our services. But why do they directly elect us? because the assessment of Department of Health against our handling in the field, both reports and also our courtesy, attentiveness to the patient or the patient or his family ...” (P2)

Love of working in helping others: Love of working in helping others according to Indonesian dictionary meant using compassion to help the others. This theme emerged from the two sub-themes such as working in the PSC was a call of the heart and feel comfortable working in the PSC.

The first sub-theme was working in the PSC was a call of heart. Statements of the participants were:
“... I want to channel the potential of my social soul, I fixed in this PSC...” (P1)
“... this is where my social work from birth, it may be appear in social environment, including my Father also embed social towards other human beings ...” (P3)
The second sub-theme that was comfortable working in PSC. This was expressed by the participants in the statement:

“... actually I didn’t have thought about to be here in PSC 119, I join this organization from my heart. I was only a volunteer, joined because I like social activities... I have an experience on dealing with the ambulance. There, my heart was touched and I join as volunteer of PSC 119 Malang... “(P1)

**Proud of being a member of PSC:** Proud according to Indonesian dictionary was having a great hearts, feel manly (because they had the advantage). This theme had two sub-themes, namely satisfied with themselves as an officer of the PSC and feel needed by others.

The first sub-theme was satisfied with themselves as an officer of PSC. This expressed by the following statement:

“... I want to help the others... the main point I wanted to help people, I want to help people no matter what happens to me. I tried to save, I tried to help and share to others ... “(P1)

“... If I become the helper, I will be happy even though I can’t give (material) at least I could give a solution ...” (P4)

The second sub-theme was feeling needed by others. Statement of the participants were:

“... I am feeling quite pleased and very happy when we can help who need us, even though in the morning hours or night we got calling, we should serve with full of responsibility...” (P1)

**Discussion**

Grateful to be a member of PSC contextually meant that participants felt grateful for their work achievement. In this study, grateful was self-gratitude, thankful for the employment situation, and thankful for gaining the trust of co-workers. Two researchs mentioned that thanks consisted of two stages: happiness feeling perceived by individual and happiness that connected to an external source. This was supported by other research that mentioned that gratitude was feeling happy to do what they received. Fourth this research had several similar aspects related to gratitude that associated with internal and external aspects. Gratitude meant the perceived happiness of individuals and this was an internal aspect. Gratitude that was connected to the external factors in this research was thankful to the work situation and gaining the trust of co-workers.

Behavior of gratitude shown by the PSC officer was by saying *hamdalah* for favors to be one member of the PSC, was chosen because that had ability, and got a sense of co-workers over working conditions in two places. This was supported by research that the most important behavior of grateful was grateful through say *hamdalah*. Moreover, the behavior thankful it went through the hearts and deeds. Thankful through the heart of each event was realized with the meaning of life and grateful by works diligently to practice their religion. Participants in this study also shown grateful behavior through heart and action that indicated by participants felt proud to be a PSC officer, become a better person, and improved themselves by learning about life after joining PSC 119 Malang. Grateful behavior through actions indicated by the behavior of participants to consider a job in the PSC was not boring, familiar with the work at the PSC, and entrusted to carry out the mandate in the PSC.

Love working in helping others contextually meant that duty as the member of PSC come from their heart. Love, in this study was love to help others by working in the PSC was a call of heart and feeling comfortable working in the PSC. Love was an attitude that consisted of feelings, cognition, and behavior that focuses on caring, concern, tenderness, willingness to help and understand others. Both studies had the same thing related concept of love that begins from feeling, cognition, and behavior. PSC officer loves the work he had started with their inner calling to help people in need. Furthermore, PSC officer think that working in the PSC is the right place to channel social life. PSC officer who have loved his job it will be reflected in the form of behavior that is using compassion when dealing with victims and serve on the PSC to help others.

The experience of loving others is a powerful reason to provide assistance to foreigners and people nearby. This love compassion for others allow individuals leads to prosocial behavior. The motivation to help others is divided into internal motivation is influenced by the value of the inwardly and externally influenced by external factors such as fear of punishment and the desire to get a prize. Internal motivation is associated with positive outcomes such as persistent in work, have an
interest in doing the job, and achievement of the general welfare. This study shows that the internal motivation that comes from the heart of Malang 119 PSC officers more prominent than external motivation. If a larger internal motivation to help others then it is associated with higher life satisfaction, positive effect on his life, and high self-esteem. It is also perceived by PSC 119 officer Malang.

Proud to be a member of PSC contextually means that the participants felt to have advantages over others that participants have a job in PSC 119 Malang. In this study, feel proud is satisfied with himself as an officer of the PSC and feel needed by others. Feeling proud to be elected as an officer of PSC is human nature. This is in accordance with the Theory of the Hierarchy of Needs by Maslow (1954), which states that if the physiological needs, security, and love have been met, then people need recognition (esteem needs) of others. Humans need stability, assertiveness, self-esteem high level, and the respect of others. When these needs are met, then someone feels confident and valuable as a person in the world.

Pride and respect for the work of self-consciousness that make up a person would devote all his attention to itself than any other person, object or event. Pride will increase the confidence of someone and make someone realize that her behavior is very useful for others. This is consistent with research that says that participants felt proud of his work as being needed by others. Someone has a sense of pride when they can thrive in the job. An agency that provides a satisfying work environment and supporting its employees will create satisfaction and make someone loves and is proud of his work.

Research showed that reputation from outsiders is a source for creating a sense of pride in the work. This is consistent with Social Identity Theory (SIT) that the views of external parties associated with the pride of staff within an institution and it is the same with job satisfaction. SIT by Tajfel and Turner (1979) states that individual would categorize themselves according to their interests or something. In addition to self-categorization, individuals evaluate groups that they consider to be a part and the group that they do not consider to be a member. An individual constantly categorize themselves by evaluating groups inside and outside and then comparing that value exists. The self-concept consisting of a social category, the evaluation group, and group membership value is the individual’s social identity. The positive social identity rewarded with positive self-esteem. This study showed that participants already categorization against themselves that as an officer of PSC 119 Malang.

Conclusion

According to lived body of four phenomenology principal on the experience of PSC 119 officers in implementing SPGDT in Malang City, East Java, Indonesia obtained the theme of being grateful to be a member of PSC, love of working in helping others, and proud of being a member of PSC. The three themes emerged as a form of psychological dimensions of PSC 119 officers. Another reason was that there was only one 119 PSC in Malang that provided pre-hospital emergency services.

Conflict of Interest: None

Ethical Clearance: This study has passed the ethical test at the University of Brawijaya Malang, East Java, with reliability number of ethical code 24/EC/KEPK-S2/01/2019.

Source of Funding: None

REFERENCES


Smoking Behavior on Fisheries in Kodingareng Island District
Sangkarrang Island

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ABSTRACT

Cigarettes are objects that contain more than 4,000 toxic substances and are very healthful for those who consume them actively and those who are exposed to smoke generated from smoking activities. The highest prevalence of smokers every day released by Riskesdas in 2013 was found in workers as farmers/fishermen/laborers at 44.5%. This study aims to explore smoking behavior in fishermen in Kodingareng Island, Sangkarrang Islands District, Makassar City. The method used is qualitative Phenomenology approach to explore smoking behavior on fishermen on Kodingareng Island. Data is collected from August 2018 to February of 2019 in an independent interview. The selection of informants used a Purposive Sampling Technique consisting of 10 fishermen 3 smokers, 3 community leaders and 1 Puskesmas officer. Data analysis with Content Analysis.

The results of the study revealed that in general fishermen did not know the ingredients and content of cigarettes, they only felt pleasure from consuming cigarettes, but there were also those who knew that they were limited to the appearance of reading on cigarette packs. Fishermen think that smoking behavior is not a problem when smokers themselves are able to find good money, a work culture that conditions them to smoke even as a child makes their attitude of thinking that smoking is common on Kodingareng Island. Smoking habits of fishermen based on smoking time, smoking function and intensity of smoking. Conclusion The smoking behavior of fishermen is different from smoking behavior in the general population, so a special approach is needed to control smoking behavior.

Keywords: Smoking Behavior, Fishermen, Kodingareng Island.

Introduction

Cigarettes are one of the addictive substances that can be bad if consumed. The effects of tobacco use or consuming cigarettes, not only on health but also on the economy. Studies conducted in America found that a smoker will incur higher costs than non-smokers, in the form of health care costs and death costs from smoking1.

More than 80% of the 1.3 billion smokers worldwide live in low and middle income countries2. Indonesia still ranks third which has the highest number of active smokers after China and India2,4, and ranks first for most male smokers from 22 countries at 67%3. The highest prevalence of smokers every day released by Riskesdas was found in workers as farmers/fishermen/laborers at 44.5%4.

The initial survey conducted on Kodingareng Island showed there were 1179 people who were fishermen, 844 fishermen were smokers, namely 19.65% and 63% passive smokers, of which 36.98% were all male sex. The high rate of passive smoking in the Island causes high rates of hypertension and ARI each year5.

Smoking behavior is caused by several factors including; lack of knowledge, cigarette advertisements,
the influence of parents who smoke, lack of parental control over children, the existence of norms or values in society and the influence of peers. Whereas a research found that causes a person to be affected to become a smoker, namely occupation, marital status, education level, location of residence, condition of residence, age and level of income.

Based on the background above, the researchers were interested in exploring smoking behavior in fishermen on Kodingareng Island.

**Material and Method**

This study used a qualitative research method with a phenomenological approach to explore smoking behavior in fishermen on Kodingareng Island, Sangkarrang Islands District, Makassar City. Data is collected for 6 months, starting in August 2018 to February of 2019 in an Independent Interview. The taking of informants used the Purposive Sampling Technique which consisted of 10 fishermen 3 family smokers, 3 community leaders and 1 Puskesmas officer. Data analysis with Content Analysis and data validity using Triangulasi Source.

**Findings**

**Knowledge:** The results of in-depth interviews with fishermen regarding their knowledge of cigarettes, varied answers were obtained.

**Knowledge of Materials and Substances in Cigarettes:** Some informants did not know the ingredients and contents of cigarettes. The informant only consumes cigarettes because of the pleasure of taste and has become his habit.

“If that is not so learned that we feel just pleasure, this is just smoking habit”.

Apart from taste pleasure, informants felt negative effects on health (such as coughing) if they consumed cigarettes without being balanced with adequate drinking.

“That’s all if we don’t drink coughing.”

Informants know the ingredients and content of cigarettes (e.g. tar and nicotine) as limited as the appearance read on cigarette packs without knowing the effects.

“What we know is what we read in the packaging, nicotine with tar but we don’t know what is nicotine and tar”.

**Knowledge about Hazard of Cigarette for Health:** Informants do not know the dangers of smoking, so it does not affect smoking behavior. Informants get information only through warning pictures of the dangers of smoking on cigarette packs, which cause fear. But that doesn’t have an effect, because there is no evidence or negative effect on the health it feels.

“Not afraid to see pictures of cigarette wrappers’’.

“The warning is not obscure, it is horrifying but there is no proof”.

Informants know the dangers of cigarettes but do not affect smoking behavior. The dangers of smoking are known to include sore throats with coughing complications, leading to cancer.

“You know, smoking often hurts the throat, especially the usual coughing’’.

“Bringing cancer”.

Informants know the dangers of smoking and influence smoking behavior. The impact of smoking affects the intensity of consuming cigarettes. The more symptoms that are felt (e.g. coughing), the lower the intensity of smoking.

“That was before I said, but I wasn’t too active if smoking didn’t have any impact, but sometimes there was also a cough when I coughed and stopped again”.

**Attitude**

**Attitude of Seeing People Smoking Around Many People:** Not knowing and not aware of the dangers of cigarettes because there is no concrete evidence of smoking-related diseases witnessed directly by informants.

“It’s not normal, but I don’t know that because I haven’t seen it with my own eyes”.

Fully aware of the dangers of cigarettes that can interfere with the health of children for example resulting in coughing

“Danger, because cigarette smoke is very dangerous for small children”.

**Attitude of Seeing Small Children Smoking:** Some informants do not allow children to smoke due to the dangers of smoking for health. The heart of a healthy
child must be protected from exposure to cigarettes, because young children are considered not yet able to regulate their breath properly, so that cigarette smoke can enter and blast the heart.

“Little children should never smoke, they are still small, their hearts are still healthy, this is still small, suction goes into the heart, you don’t know what to do”.

In addition, informants consider children and adults not a measure to limit smoking behavior, as long as they are able to make their own money to buy cigarettes.

“If money seekers are not papaji, if they don’t look for money, how about when they run out of cigarettes, don’t let them think about anything else.”

The informant considered the coastal communities primarily parents who work as fishermen to have a work culture that conditions them to smoke even as a child.

“Here, there are still small children who smoke teachings from the parents of fishermen if there are also small fishermen.”

**Smoking Attitudes in the Home:** Informants allow smoking in the house, because smoking is considered normal, and is not a cause of disease. For example the example of lung disease, where the disease is not only suffered by smokers, but also by non-smokers.

“If I don’t ji, I don’t get sick because there are also people who don’t smoke on X-rays because of lung disease, smoking is also there, that means cigarettes are just like that, don’t make people sick because I have experienced so much, no Broken smoking is also the same as the lungs are smoking “.

**Smoking Habit:** From the results of in-depth interviews, informants’ smoking habits can be grouped based on smoking time, cigarette function and the intensity of smoking. Based on smoking time, informants consume cigarettes after eating, drinking coffee, staying up late, playing cellphones and hanging out. Informants smoke at these times to increase the taste pleasure from previous activities.

“It depends on the smell, but if you eat less, if you don’t eat, you have to drink coffee, days”.

When feeling dizzy and a lot of thoughts, informants consume cigarettes to reduce negative feelings.

“After eating, I’m confused about smoking”.

Smoking habits based on cigarette function, informants consume cigarettes to relieve cold and refresh the body after diving.

“We will dive, if the sailor uses our lifeboat to dive, so if you dive in cold, that’s the advantage of smoking fresh when you finish diving, it doesn’t feel cold anymore”.

In addition to eliminating the cold when in the sea, cigarettes also function to relieve sleepiness while at sea.

“Get used to if you go 2 to 3 fishing nights a day so that I’m not sleepy if smoking”.

Smoking habits based on the intensity of smoking, more when in the sea, which is as much as two packs, compared to when on land informants only consume less than one packet.

“There are more in the sea because if I go, usually two packs I carry for one day, on one land do not run out”.

**Discussion**

Knowledge is the result of knowing someone through their senses through vision, hearing, smell and so on. In general, fishermen only know the ingredients and content of cigarettes according to what they feel and what they read in cigarette packs. On the cigarette pack is a warning about the dangers of cigarettes and their contents. However, there is no deeper explanation about the effects of substances on health.

Consuming cigarettes, giving pleasure to smokers. Nicotine is addictive which can make someone who consumes it addicted. When nicotine enters the body, smokers will feel pleasure. The result is smokers will feel calmer, more brilliant thinking power, and able to suppress hunger. Psychological satisfaction contributes very highly to smoking behavior, which is 40.9%. This illustrates that smoking behavior is considered to provide pleasure and pleasure. Cigarettes are believed to be able to bring effects on positive emotions that affect the psychology of smokers who feel pleasure due to smoking.

Viewed from any angle, cigarettes still have a negative effect. Eating cigarettes has a negative effect on health. Nevertheless, fishermen still consume cigarettes, because
for them, nothing they see directly affects them so they don’t smoke anymore. The negative effects that are felt in the form of coughing are a disease that is easily eliminated and is not considered dangerous so they continue to enjoy cigarettes. Knowledge of substances, cigarette ingredients and the danger of consuming cigarettes for health that is still minimal in fishermen causes them to maintain their smoking behavior. This study is in line with the results of a study said that a smoker who has a good knowledge of the health hazards of smoking has a positive attitude to refuse to become a smoker\textsuperscript{16,17}.

The attitude of fishermen in general considers smoking behavior is a natural thing, but smoking behavior to children for them is not a problem as long as the child is able to make their own money. Children who do not smoke are considered as lazy children because there is no reason to encourage them to work. Another case for children who smoke will try to work to find cigarette money. In addition, the work environment that makes children have to smoke causes them to assume that smoking is a natural thing, even though there are a small number of fishermen who consider smoking behavior in children inappropriate, because the child’s heart and lungs are still considered too weak and dangerous for his health. The negative attitude shown by the fishermen is supported by the results of a research stating that there is a significant relationship between attitudes and smoking behavior\textsuperscript{18}. In line with another research which states that there is a relationship between the attitude and smoking practices\textsuperscript{19}.

Cigarette fishermen are friends when at sea. The smoking habit of fishermen is based on smoking time, cigarette function and smoking intensity, namely the number of cigarettes consumed per day. The smoking times of fishermen such as after eating, drinking coffee, staying up late, and fishing. Smoking habits based on the function of cigarettes are to reduce sleepiness, and cold when in the sea, and to eliminate dizziness or stress. Various psychological factors that influence a person to become a smoker are the presence of pleasure, relaxation and can reduce stress\textsuperscript{20}. Women in Hong Kong despite knowing the health hazards caused by smoking, they continue to consume it because smoking is used as a strategy to reduce stress and other negative emotions\textsuperscript{14}.

Based on Management of Affect theory, smoking behavior can divide into four types: the type of smoker who is affected by positive feelings, where a smoker consumes cigarettes to increase his positive feelings such as feeling happy and so on. Addictive smoking behavior. This type of smoker is caused by a heavy addiction so that smokers want to add to the dose of cigarettes every time the effect of the previous cigarette consumed starts to decrease. And smoking behavior that has become a habit. The purpose of smoking in this type is not to increase the dose, get positive feelings or eliminate negative feelings but smoke because it has become a habit\textsuperscript{21}.

**Conclusion**

1. Knowledge of fishermen is minimal about the ingredients and content of cigarettes and the danger to the body, they only know the extent of the appearance of cigarette packaging and the experience they have felt.

2. The attitude of fishermen considers smoking behavior is a natural thing both for children and adults.

3. Smoking habits based on smoking times (after eating, drinking coffee, eating and fishing/fishing), based on the function of cigarettes (to relieve cold, eliminate drowsiness and stress), and based on the intensity of cigarettes.

**Suggestion**

An effort to control smoking behavior is needed in fishing communities by taking into account the characteristics of the region, their environmental conditions and culture.

**Conflict of Interest:** All authors declared no conflict of interest.

**Ethical Clearance:** This study was approved by Health Research Ethics Committee Faculty of Public Health, Hasanuddin University

**Source of Funding:** Self

**REFERENCES**


The Role of MgO and CaO Nano-Particles on Staphylococcus Epidermidis Isolated from Catheter Indwelling Patients

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ABSTRACT

The role of nano-particle metal oxides MgO and CaO as inhibitors to bacterial growth has been evaluated. The bacterial samples collected from catheters at a number of medical centers are diagnosed by culturing and biochemical tests to yield 18 isolates of S. epidermidis. Identification and particle size of the received MgO NPs, and CaO NPs are analyzed by X-ray diffraction. These are then examined for their antibacterial activity against S. epidermidis by the agar diffusion method, biofilm inhibition and minimum inhibitory/bactericidal concentration (MIC/MBC). The outcomes of the inhibition zone show that both MgO NPs and CaO NPs spread similar zone activity of (25 mm ± 2 mm) at 10 µg/ml concentration. For the biofilm inhibition, MgO NPs had (82 %), and CaO NPs had (76 %) at 10 µg/ml indicating good inhibition to biofilm formation. The test of MIC/MBC showed that MgO NPs are more efficient at lower concentration (1.25 µg/ml) in comparison with CaO NPs (2.5 µg/ml). Above these concentrations, complete inhibition of S. epidermidis is observed as an indication of the efficacy of these inorganic nano-particles in suppressing the growth of bacterial invasion.

Keywords: Staphylococcus epidermidis, Nano metal oxide, Catheter, Antibiofilm.

Introduction

Inorganic nano-particle compounds have drawn much research interest by their unique characteristics at the macromolecular, molecular and atomic levels as reducers of microbial infections 1. Some of the metal oxides compounds, such as MgO and CaO nano-particles (NPs) are considered as bacterial inhibition agents and as safe materials to humans 2. Many biologists have increasingly focused their attention on these materials for being as effective inhibitors of resisting pathogenic strain 3.

The mechanism of antibacterial activity of NPs can be interpreted by interacting with bacterial surface and then entering inside the cell, which eventually led to its destruction. Occasionally, these materials can have bactericidal impacts that are essential in different antimicrobial applications 4. The small size or large surface area of NPs had high active contact with the microbial cells raising the penetration and interaction through the cell membrane promoting their antimicrobial activity 5.

As being antimicrobial agents, the effectiveness of NPs has been tested for their ability to restrain bacterial colonization on different surface devices, like catheters 6. Chronic infections caused by pathogenic bacteria are difficult to treat because of their ability to destroy host tissue causing resistance to antibiotics 7. Therefore, strategies have recently been implemented in the next-generation of agents or drugs to restrain bacterial infections from inorganic or natural substances, safe to human beings as having relatively less toxic and endocrine disruptive effect 8. S. epidermidis infections caused by the use of medical devices (catheters), can be colonized by micro-organisms that form an adherent biofilm on the surface of the device 9, and is the most common concerns of the line associated bacteremia and other polymer-related infections among UTI patients 10, 11. Catheter encrustation and blockage are reported as a common complication in the care of patients undergoing long-term indwelling bladder catheterization 12, 13.

Few studies have been carried out to assess the efficacy of MgO and CaO NPs against virulence factors of S. epidermidis in vitro. Therefore, for UTI patients, this study aims to evaluate the role of MgO and CaO NPs as antibacterial active agents towards S. epidermidis isolated from indwelling catheters.
Materials and Method

Collection of specimens and Growth Conditions: Eighteen specimens of S. epidermidis in this study were isolated from the surfaces of infected intravenous catheters taken from both sexes. We enrolled patients aged 20-70 years visiting hospitals in Baghdad and Kirkuk city for six months through 2017-2018. Strain diagnosis was verified by biochemical characterization tests 14,15.

Bacterial growth samples were transferred via sterile loop into nutrient broth media and were incubated at 37 ºC for 24 h. Then 0.1 ml of each sample was transferred into sterilized test tubes containing 0.9% NaCl solution.

Identification and Preparation of NPs dilutions: White powders of MgO NPs with purity 99.5% and CaO NPs with purity 99.95% were obtained from the Nanografi Nanotechnology (Turkey). For confirmation, material identity and particle size measurement of the powders were analyzed by X-Ray diffraction (XRD) techniques.

In 10 ml of dimethyl sulfoxide (DMSO), about 10 mg of each powder was suspended to prepare a stock solution of 1 mg/ml. Lastly, we again diluted 1 ml of the solution by 10 ml of DMSO that yield a solution of (100 µg/ml) concentration for the next steps.

Antimicrobial activity of MgO and CaO NPs: The antimicrobial activity of MgO and CaO NPs vs the isolates of S. epidermidis was calculated using the agar diffusion method as follows:

Hollow wells were cut into the solidified nutrient agar (NA) in Petri dish plates by cork borer of ~ 5 mm diameter and used to test all bacterial isolates. 0.1 ml of MgO NPs or CaO NPs suspended in (DMSO) taken from various concentrations namely 2, 4, 6, 8 and 10 µg/ml were put to these wells. The plates were incubated at 5-8 ºC for 2 - 4 h to achieve good diffusion and then incubated at 37 ºC for 24 h. Then, the inhibition zone diameter (mm) formed around the wells was calculated and compared with the activity of (DMSO) alone without MgO NPs or CaO NPs which showed no impact on these bacteria 16,17.

Microtiterplate Assay: Biofilm production was obtained using a microtiter plate assay as previously described 19. Briefly, S. epidermidis were incubated overnight in 10 ml of Tryptic Soy Broth (TSB) and 0.25% glucose at 37 ºC with continuous shaking.

After that, the cultures were diluted 1:100 and 200 µl of this dilution was transferred to each well in the plate and subsequently inoculated aerobically for 24 h at 37 ºC. The culture was washed three times using 200 µl of phosphate buffer saline (pH= 7.4) to eliminate nonadherent cells, and then, dried in an inverted position. Adherent bacteria were fixed with 95% ethanol and stained with 1% (Wt/Vol) crystal violet for 10 min. Excess of unbound crystal violet was removed by gentle washing three times with of sterile distilled water. After clearing the water, the microtiter plate was air dried for 2h. The optical density (OD) at 590 nm was measured, and a mean value was calculated from three replicates. Finally, this value was considered to be (adherence positive) at ≥ 0.12, (adherence negative) < 0.12.

Biofilm inhibition: Biofilm inhibition was carried out in microtiter plate assay adopting the method of biofilm formation 19,20. Different dilutions of NPs were added to the wells containing cell suspension of the prepared isolates, and the procedure was continued as described already with the same concentrations of MgO and CaO NPs sited earlier. Percentage of inhibition was calculated according to the following formula 20:

\[ \% \text{ of inhibition} = \frac{\text{OD in control} - \text{OD in treatment}}{\text{OD in control}} \]  

Minimum inhibitory/bactericidal Concentrations: The minimum inhibitory concentrations (MIC) were analyzed in MgO, and CaO NPs toward S. epidermidis isolates according to 21 by the following steps: 1) We put 1 ml of medium (i.e.nutrient broth) in a test tube. 2) 1 ml of test solution was added to it. 3) 0.1 ml of bacterial isolates that prepared in 0.9% of NaCl were inserted to the test tube consisting of test and media solution.

For each NPs, five serial dilutions of 10, 5, 2.5, 1.25 and 0.625 µg/ml were performed followed by incubation at 37 ºC for 24 h. The positive occurrence of turbidity was compared with a sample of 0.5 McFarland standards. At the same dilutions, the control test was included as broth samples inoculated with DMSO only which had no impact on the bacterial growth.

Also, we obtained the minimum bactericidal concentration (MBC) by sub-culturing 50 µg/ml to each test group which revealed that no evident growth
occurred. Thereby, for no growth, this concentration would be deemed as MBC. Statistical information was conducted by analysis of variance (ANOVA) and T-test at significance P values below 0.05.

Results and Discussion

X-ray Diffraction: Figure 1 illustrates the X-ray diffractograms of MgO and CaO NPs taken with Cu Kα radiation. The indexed peaks match with the PDF2 - ICDD files for MgO and CaO. Particle size was analyzed by Scherrer’s method to give a nano-size of 18 nm for MgO and 45 nm for CaO.

![Caption (M) and Caption (C)](Figure 1: X-ray diffractograms of (a) MgO NPs and (b) CaO NPs)

Bacterial Growth Diffusion: Isolates from indwelling catheter-related bacteriuria grown by the agar diffusion test are indicated by the illustrations shown in Figure 2, regarding the inhibition zone manifested by the effect of MgO and CaO NPs. The antibacterial activity of these nano-particles is probably to be related to exhibiting smaller particle size in comparison to bacterial cells thus facilitating adherence to its cell walls leading to their destruction and death.

![Caption (M) and Caption (C)](Figure 2: Inhibition of S. epidermidis growth in agar diffusion test by 10 µg/ml concentration of MgO NPs and CaO NPs)

Measurements of the inhibition zone for S. epidermidis growth against different concentrations of MgO and CaO NPs are given in Table 1. It is noted that the total biomass of S. epidermidis was decreasing in the setup concentrations of nanoparticles studied compared to control (without NPs), and MgO NPs had higher diffusional activity (27 mm zone diameter) in comparison to CaO NPs (23 mm zone diameter) at the same concentration of 10 µg/ml. The role of nanoparticles as antimicrobial active agents can be understood by their chemotherapeutic nature to control and reduce infections and can be employed in bacterial infections treatment.

Table 1: Inhibition zone of MgO NPs and CaO NPs against S. epidermidis growth

<table>
<thead>
<tr>
<th>Concentration (µg/ml)</th>
<th>Mean zone diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MgO NPs</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>10</td>
<td>27</td>
</tr>
</tbody>
</table>

Biofilm Inhibition Percentage: Biofilm formation of S. epidermidis was studied by overnight grown culture in 96- wells of a polystyrene microtiter plate. Adherent biofilm is then determined by the occurrence of dark staining material on the wells’ bottoms. The manner in which the antibiofilm effect is noted may be explained as dose-dependent. The inhibition of biofilm in the microtiter plates has shown the formation of S. epidermidis biofilm to decrease with the concentration of nano-particles manifested by the measured optical density shown in Figure 3. The calculated inhibition percentages (%) of biofilm due to the efficacy of nanoparticles are tabulated in Table 2.
Figure 3: Bacterial growth (in terms of OD) of *S. epidermidis* at different concentrations of MgO and CaO NPs

Table 2: Biofilm inhibition of *S. epidermidis* by MgO and CaO NPs concentrations

<table>
<thead>
<tr>
<th>Concentration (µg/ml)</th>
<th>MgO inhibition (%)</th>
<th>CaO inhibition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>39</td>
<td>36</td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>44</td>
</tr>
<tr>
<td>6</td>
<td>63</td>
<td>51</td>
</tr>
<tr>
<td>8</td>
<td>71</td>
<td>63</td>
</tr>
<tr>
<td>10</td>
<td>82</td>
<td>76</td>
</tr>
</tbody>
</table>

As listed in Table 2, MgO NPs recorded a slightly better antibiofilm effect in comparison with CaO NPs for all concentrations. Moreover, both NPs show a significant decrease in the formation of biofilm due to the presence of MgO NPs (82%) and CaO NPs (76%) at (10 µg/ml) concentration. Similar behavior is observed with Ag NPs in the biofilm inhibition of *Escherichia coli* and *Pseudomonas aeruginosa*.

The results of MIC (Table 3) show that *S. epidermidis* is inhibited at concentration 1.25 µg/ml for MgO NPs and 2.5µg/ml for CaONPs. MBC has also demonstrated similar behavior for both NPs, and these results indicate that cells treated with 2.5µg/ml of MgO NPs and 5.0µg/ml of CaO NPs were no longer culturable suggesting their lethality on bacterial pathogen common in catheter-acquired infections.

Table 3: Antibacterial activity of MgO and CaO NPs against *S. epidermidis* at MIC/MBC

<table>
<thead>
<tr>
<th>Concentration (µg/ml)</th>
<th>MgO NPs</th>
<th>CaO NPs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIC</td>
<td>MBC</td>
</tr>
<tr>
<td>0.625</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>1.25</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concentration (µg/ml)</th>
<th>MgO NPs</th>
<th>CaO NPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The better antibacterial activity of MgO NPs may be due to its smaller particle size compared with CaO NPs. Their antibacterial activity is a consequence of the potency to insinuate the walls of the bacterial cell and lead damage to its cytoplasm. The MIC value of CaO NPs studied by Roy et al. on *S. epidermidis* is found to be 2mM which is comparable to what has been found in this study an indication that the route of producing these nanoparticles had no significant effect on antimicrobial activity especially regarding dose concentration.

Similar behavior to these results has been observed by Kadhum in studying the effect of nanoparticles of ZnO and SiO2 on various kinds of bacterial growth including *S. epidermidis*. Interpretation of antibacterial activity of MgO and CaO NPs reported from several citations rely on the generation of active oxygen as having a primary role, in addition, to increase in pH of the medium as another influencing factor. The overall picture of the use of inorganic nanoparticles as a counterpart of adherence suggests their usefulness in influencing bacterial suppression by a mechanism that causes the bacteria to coagulate by the break of the microbial cell membrane in nanoparticle suspension.

**Conclusion**

The antibacterial role of MgO and CaO nanoparticles as active agents towards *S. epidermidis* is evaluated. The in vitro incorporation of these nano-particles against the growth of *S. epidermidis* has provided robust scientific evidence that they are effective antimicrobial agents and that eventually inhibit bacterial adhesion and biofilm formation.

**Acknowledge**

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Source of Funding: The authors have no sources of funding, so it is self-funding research.

Ethical Approve: We declare that the study does not need ethical approval.

Ethical Clearance: This study was conducted with approval from the research ethics committee at the College of Sciences of Kirkuk University.

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Lactobacillus Casei Strain Shirota: Overview of Blood Sugar Levels and Blood Fat from Children Obesity and Fatting

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ABSTRACT

Some survey results show that the prevalence of obese and fatty children is increasing rapidly both in the world and in Indonesia. Impacts that can occur for obese and fatty children in the future are degenerative diseases and decreased productivity. Probiotics are natural microorganisms found in the digestive system, which are deliberately bred as food/beverage supplements which if consumed in balanced amounts will have a positive impact on health. One good probiotic for health is Lactobacillus cassee strain Shirota is a type of bacteria that is resistant to the reaction of stomach acid, and has many important roles in the human body in the intestine, and its important role is to help digestion. The purpose of this study was to prove the effect of supplementation of L. casei strain Shirota on the profile of blood sugar, total cholesterol, triglycerides, LDL, and HDL in obese and fatty children. Type of experimental research with pre-post test only design. Samples are children aged 6-12 years, obese and fatty, cooperative. The results showed that there was a significant effect of L. casei strain Shirota supplementation on total cholesterol (p = 0.005), but not significantly on when blood sugar, triglycerides, LDL and HDL (p> 0.05). Conclusion there was an decrease in total cholesterol levels after L. casei supplementation. Similarly, there was no significant increase in when blood sugar, decrease triglycerides, decrease LDL and decrease HDL levels. Suggestion L. casei needs to be given to obese and fatty children every day to improve digestion and reduce total cholesterol levels.

Keywords: Lactobacillus casei, blood sugar, cholesterol, triglycerides, LDL and HDL

Introduction

The rate of obesity in children in Indonesia has tripled, according to a global study released in the New England Journal of Medicine. They have the potential to suffer from various types of diseases as adults, including diabetes, heart disease and cancer. Based on the 2016 National Health Indicator Survey data, as many as 20.7% of Indonesia’s adult population are overweight. This number increased from 15.4% in 2013¹,²,³,⁴. The Global Burden of Diseases study published in the scientific journal, Lancet, in 2014 placed Indonesia at number 10 in the list of countries with the highest obesity rates in the world. The rate of obesity in children grows much faster than adults⁵,⁶,⁷.

Some research findings have found evidence that obesity has an important role in cases of death in as many as four million cases in 2015. This has a greater global problem. This study proves that there is no country in the world that has succeeded in reducing the number of people with obesity, even though the economic losses caused are not small. Ironically, obesity cases are also increasing in countries that are threatened by food insecurity such as in Africa⁸,⁹. According to the study, Burkina Faso is the country that records the highest obesity growth in the world. While Egypt has the highest number of adult obesity sufferers.

The rate of obesity among children in Indonesia shows a sharp increase. The indication is an improvement in the family’s economic conditions which causes easy access...
to various forms of food. However, there are external factors that also influence it. Some cases indicate that some children were asked by their mothers to play with their friends outside the home\textsuperscript{10,11}. Moreover, after school, children of the same age are busy doing activities around the housing complex. But, the child prefers to be at home, spending time with his electronic game device. According to the mother, the child does not tend to be picky when eating, or enjoy whatever food is available. But on the other hand, he doesn’t have much physical activity\textsuperscript{12}.

His parents’ encouragement to take part in extracurricular activities in schools that burn calories, such as taekwondo or swimming, is only a few times. Not surprisingly, he was much heavier than his own brother who was 3 years older. The child has not been picky about food, anything eaten. Her pants are now wearing size number 34, because of the large circumference of her abdomen. The school uniform, if the older sibling can replace the new four years, if the child is only two months old, he has to change, because he is getting bigger\textsuperscript{3,12}.

According to experts obesity continues to increase, due to unhealthy consumption patterns. In Indonesia, children from families with middle to upper economic conditions experience this, because of the ease of accessing various types of food. Parents tend to want their children to eat a lot, and choose the types of high-calorie foods. This type of fast food is also popular and popular with children, including menus that contain high sugar. At the same time, children, especially in urban areas, began to lack physical activity, due to the increasing hobby of playing games. About 30 percent are obese in the adult group. Children and adolescents are in the top ten percent who are obese. However, in this group of adolescents this is not only a problem of obesity, because blood pressure also starts to rise\textsuperscript{5,10,11}.

In several studies found evidence also that the symptoms of high blood pressure among adolescents, as a follow-up impact of obesity, excessive salt consumption, high stress levels and lack of physical activity. Not surprisingly, now, various diseases such as sugar and heart have been found in the age group of 30 years. This phenomenon occurs because the actual trigger factors have been initiated and saved since the age of the children. One of the probiotics that are widely used today is L. casei with various advantages including improving metabolism\textsuperscript{14,15,16}.

Research purposes analyzing changes in profile of blood glucose levels, total cholesterol, triglycerides, LDL and HDL after receiving supplementation L. casei for obese and fatting children.

**Material and Method**

This type of research is an experiment with a pre-post test only design. Research locations at SD Inpres Perumnas I and IV Makassar City. Time of study in March - August 2018. Population: all students at SD Inpres Perumnas I and IV Kota Makassar

Samples: all obese and obese students. The sampling used was simple random side which was chosen by 12 people, but on the trip of the 1rd week of intervention resigned for technical reasons. So the end of the study only got 11 samples. The sample was given L. casei strain Shirota for 1 month. Data analysis using t-test 2 samples in pairs with normal data distribution requirements.

Blood sample results, a serum examination was performed to determine the blood sugar levels, total cholesterol, triglycerides, HDL and LDL. Examination of the variables under study was carried out at the Community Eye Health Laboratory, Tajuddin Chalik Hospital, Makassar City.

**Findings**

Based on the results of this study shown in the table below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Before (mg/dl)</th>
<th>After (mg/dl)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>when blood sugar</td>
<td>96.73 ± 7.66</td>
<td>97.09 ± 17.45</td>
<td>-0.083</td>
<td>0.936</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>173.91 ± 32.18</td>
<td>156.73 ± 29.76</td>
<td>3.536</td>
<td>0.005</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>147.00 ± 67.69</td>
<td>119.91 ± 49.29</td>
<td>1.311</td>
<td>0.219</td>
</tr>
<tr>
<td>LDL</td>
<td>100.09 ± 26.84</td>
<td>92.36 ± 22.01</td>
<td>2.026</td>
<td>0.070</td>
</tr>
<tr>
<td>HDL</td>
<td>45.09 ± 6.20</td>
<td>42.27 ± 6.05</td>
<td>1.497</td>
<td>0.165</td>
</tr>
</tbody>
</table>

**Table 1: Effect of L. casei strain Shirota on Blood Sugar while and Blood Fat of Obesity and Fatting Children in 2018**
Based on table 1 above shows that L. casei supplementation increases when blood sugar levels and blood fat levels. When blood sugar levels increased from 96.73 ± 7.66 mg/dl to 97.09 ± 17.45 mg/dl but were not significant (p> 0.05), this implies that when blood sugar increased with L. casei supplementation, total cholesterol levels decreased significantly (p = 0.005), ie from 173.91 ± 32.18 mg/dl to 156.73 ± 29.76 mg/dl, it was proven that L. casei supplementation reduced total cholesterol levels.

Triglyceride levels decreased not significantly (p> 0.05), ie 147.00 ± 67.69 mg/dl to 119.91 ± 49.29 mg/dl. LDL levels decreased not significantly (p> 0.05) from 100.09 ± 26.84 mg/dl to 92.36 ± 22.01 mg/dl. HDL levels decreased not significantly (p> 0.05) from 45.09 ± 6.20 mg to 42.27 ± 6.05 mg.

Table 1 also shows that the average increased in when blood sugar levels is 0.36 mg/dl, total cholesterol levels decreased by an average of 17.18 mg/dl, triglyceride levels decreased by an average of 27.09 mg/dl, LDL levels decreased by an average of 7.73 mg/dl, HDL levels decreased by an average of 2.82 mg/dl.

**Discussion**

Cholesterol is a fat-shaped compound that is mostly produced by the body in the liver from fatty foods consumed which are needed by the body to make cell membranes, wrap nerve fibers, make various hormones and body acids. Cholesterol cannot be circulated directly by blood because it is insoluble in water. To circulate it, a “transport” molecule called lipoprotein is needed. There are two types of lipoprotein, namely high density lipoprotein (HDL) and low density lipoprotein (LDL)\(^{1,5}\).

The mechanism of cholesterol reduction can occur because lactic acid can degrade cholesterol into coprostanol. Coprostanol is a substance that cannot be absorbed by the intestine. Thanks to coprostanol and the remaining cholesterol can be removed with feces. In other words, the amount of cholesterol absorbed by the body becomes low. A report on this matter explained that the reduction in cholesterol by lactic acid bacteria (Lactobacillus) could reach a range of 27-38%\(^6\).

High fat consumption will increase sterol in the large intestine and increase the secretion of bile salts, which will then be metabolized by bacteria in the intestine to produce carcinogenic compounds (cancer triggers). Cholesterol in food ingredients through the stomach to the duodenum and in the intestine in the triacylglycerol oil phase\(^15,16\).

Bile acids are absorbed from the bottom of the ileum and return to the liver. This is the hepatic circulation. The collection of bile acids in the liver is approximately 3.5 grams circulated 6-10 times per day. Each time 1%, which is around 500 milligrams/day, escapes absorption and is excreted through the stool. Furthermore, body cholesterol is secreted through the intestine by the intestinal wall. Bile salts are wasted through the stool and result in more cholesterol needed to synthesize bile salts and reduce the body’s cholesterol levels\(^10,12,14\).

The process of forming cholesterol and carcinogens (compounds that trigger tumors) starts from fat that will turn into bile acids which then become a series of enzymes. Then change the procarcinogen into a carcinogen, which among others triggers colon, breast, prostate, and pancreatic cancers\(^3,5,6,8\).

The process of forming bile acids from fat is stimulated by faecal bacteria or coli bacteria originating from feces or feces. But with the presence of lactobacillin, the faecal bacteria become inactive so that the process of changing fat into bile acids is also stopped\(^8\). Another compound of lactic bacteria is NI (not yet identified or unknown)\(^8\). However, this compound has a known role in inhibiting the formation of cholesterol. NI works to inhibit the enzyme 3-hydroxy 3-methyl glutaril reductase which will convert NADH to nevalonic acid and NAD\(^4,8,12\). Thus, a series of other compounds that will form cholesterol are also inhibited. Therefore, it can be said that the presence of foods and beverages naturally acidified with lactic bacterial fermentation can help prevent cholesterol and cancer from arising\(^5,16\).

**Conclusion**

1. L. casei strain Shirota supplementation in obesity and fatting children causes an not significant increase in when blood sugar levels.
2. L. casei strain Shirota supplementation in obesity and fatting children causes a significant reduction in total cholesterol levels
3. L. casei strain Shirota supplementation in obesity and fatting children caused a not significant decreased in triglyceride, LDL and HDL levels but the highest decreased in triglyceride levels.
Conflict of Interest Statement: This research without conflict of interest between researchers and subjects.

Source of Funding: This study uses funding from the Ministry of Health Polytechnic and also to PT Yakult Indonesia who have volunteered to provide L. casei strain Shirota products in the research that has been conducted.

Ethical Clearance: Research ethics was obtained through the ethics commission of the research of the health and health polytechnic of Makassar with No. 467/KEPK-PTKMKS/VII/2018.

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Role of Manual and Powered Tooth Brushes in Plaque Removal and Oral Health Status (A Comparative Study)

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¹Department of Periodontology, College of Dentistry, University of Kufa, Iraq

ABSTRACT

Aim of the Study: Evaluate the plaque and calculus removal during the manual and powered brushing of teeth and To compare manual and powered toothbrushes in everyday use, principally in relation to plaque removal.

Materials and Method: A randomized blinded controlled trial with 50 healthy human volunteers of age group 18-25 years was carried out. The subjects were randomly assigned to 2 groups i.e., groupA - manual brushing with and without dentifrice, Group B - powered brushing with and without dentifrice. Plaque accumulation and gingival condition were recorded using plaque index. The test treatments were brushing with 2 oscillating rotating electric toothbrushes, a manual toothbrush and a rinse with a toothpaste slurry (3 g/10 ml water).

Results: Mean plaque and gingival scores was reduced over the 3 week trial period for all groups manual Brushing with or without a dentifrice resulted in a mean plaque reduction of 49% and powered brushing with or without a dentifrice resulted in a mean plaque reduction of 60%

Discussion: the efficacy of plaque removal has been emphasized more with powered tooth brush rather than manual tooth brush, and as brushes with hard bristles may precipitate adverse changes associated with brushing, like, abrasion of tooth surface as well as traumatizing the gingival margin, the need of hard bristled toothbrushes in the market is questionable.

Conclusion: the plaque and calculus has removed during the manual and powered brushing of teeth. powered tooth brush has more effect than manual tooth brush in removing plaque and calculus.

Keywords: Manual, powered tooth brushes, gingivitis, oral hygiene, plaque index.

Introduction

It is widely agreed in dentistry that plaque consist of a combination of pathogenic microorganisms and host cells. Which consider is the principal etiological factor associated with periodontal disease. Since Loe’s experimental gingivitis, [1] thorough plaque control has been essential to control and prevent gingival and periodontal disease. Supra gingival plaque control is dangerous in preventing both initial gingivitis and periodontal disease in all stages. [2] Mechanical tooth cleaning by means of a toothbrush and a dentifrice remains the most effective and common method for controlling supra gingival plaque. [3,4].

Dentifrices are supposed to prevent plaque buildup, strengthening teeth against caries, elementing stains, removing food debris, and control the oral mouth. [5,6] Dentifrices containing anti-plaque and anti-inflammatory agents would also elemental plaque and help in overcoming the manual or mechanical shortcomings of brushing. [7].

Most of the studies that evaluate the role of a dentifrice in plaque removal and those that assess different toothbrush designs, were done by making comparison of the result product with the control. In such studies, the obtained plaque removal score could be due to the use of toothbrush and dentifrice, it was difficult to distinguish the contribution of either toothbrush or dentifrice.

There are several studies that attempted to define the role of dentifrices in plaque removal during mechanical tooth brushing. One study [8] stated that brushing with a dentifrice removed more plaque than brushing alone. Another study [9] found no difference between brushing
with or without a dentifrice; in another studies done by Binny et al.,[10] and Paraskevas et al.,[11] brushing without a dentifrice found more plaque reduction when brushing without dentifrice than brushing with a dentifrice. A recent study [12] showed that the use of a dentifrice is not cause additional plaque removal during manual tooth brushing and concluded that the mechanical action provided by the toothbrush is crucial in plaque control. Although each study differs in factors related to the study methodology, the overall result is important.

The present study was undertaken in order to view the conflicting role of dentifrices and the effect of its role when used in associoted with tooth brushing. The aim of the present study is to detect the actual role of the dentifrice and demystify its effect when associated with use of tooth brush.

**Efficacy of Tooth Brushing:** Previous studies showed of plaque accumulation and removal with daily tooth brushing during a 28-day period following a dental prophylaxis. On average about 60% of the plaque was left after the self-performed brushing. Morris et al.[13] reported on the 1998 UK Adult Dental Health survey and observed that the mean proportion of teeth with plaque deposits was 30% in the 25–34-year age group and 44% in those aged 65 years and above. At the Academic Centre for Dentistry Amsterdam (ACTA) a study was conducted which assessed the efficacy of a single 1-minute brushing exercise in subjects adhering to their customary brushing method Van der Weijden et al.[14] It was observed that after 1 minute of brushing, approximately 39% of the plaque had been removed. The results of the studies described above indicate that most subjects are not effective brushers and that they probably live with large amounts of plaque on their teeth, even though they brush once every day.

**Electric Toothbrushes:** To invest the necessary time and effort to well instructed and motivated and properly instructed individuals who are doing, international toothbrushes and adjunctive manual (interdental) devices, mechanical measures are effective in removing plaque. Maintaining a dentition close to plaque-free is, however, not easy. Plaque removal and patient motivation where doing by The electric toothbrush. Electric toothbrushes were making to the market more than 50 years ago. Bemann & Woog in Switzerland, The first toothbrush powered by electricity was developed by them and was introduced in the United States in 1960 as the Broxodent. General Electric, In 1961 a cordless rechargeable model was introduced by Studies of the use of these early electric toothbrushes showed that there was no difference in plaque removal when compared with a manual toothbrush and they had mixed effects on gingivitis [15].

**Aims of the Study:**

This study has used to

1. detect the effect of plaque and calculus removing during the use of manual and powered brushing of teeth.
2. we make comparison by manual and powered toothbrushes in everyday use. Principally in relation to plaque removal and gingival health. Stain, calculus removal.
3. compare the role of using the manual and powered brushing of teeth in the reduction of gingivitis and plaque.

**Material and Method**

**Study Design:** The group study consisted of 50 student of College of dentistry, Kufa, Iraq. Male and female in age range (20-23) years. the volunteers were examined in perfect study with suitable time to indicated severe cases in relation to periodontal disease and restorative-related problems. Data collected by the use of dental mirror, probe and The study period lasted for 10-week.

Single-examiner blind was used for examination A group of 25 subjects participated in this, randomised, crossover design. Subjects had fair oral hygiene and the electrical tooth brush never used previously. Subjects were plaque free in 7 days by the use of rotating electric toothbrushes, a manual toothbrush and a rinse with a toothpaste slurry (3 g/10 ml water).

**Brushing Exercise:** Before starting, the patient was asked to wet the brush head with tap water and the brushing time was two minutes for the whole mouth. [16,17] 30 seconds per quadrant, 15 seconds for the buccal side, and 15 seconds for the lingual side. When dentifrice was used for brushing, 2 ml of dentifrice was adding onto the toothbrush using a syringe with dentifrice (sensodyne). The supervision of the brushing procedure was done by a different examiner. A stop viewing was used and a signal was given to the subject to change the brushing surface.
The Clinical Parameter

![Plaque index](image)

**Figure 1: Plaque index**

**Results**

Fifty two students (volunteers), 10 students didn’t participate after the first phase, either due to their college examination or because of their sickness. The remaining 42 students were divided into two groups (1 and 2) of 21 each and they use tooth paste randomly. The mean of the total plaque indices by manual brushing with and without dentifrice are tabulated in [Table 1]. the mean of the plaque indices by powered brushing with and without tooth paste are tabulated in [Table 2]. Manual Brushing with or without a dentifrice resulted in a mean plaque reduction of 49% and powered brushing with or without a dentifrice resulted in a mean plaque reduction of 60%. This 11% difference is highly significant (P≤0.0001).

<table>
<thead>
<tr>
<th>Time</th>
<th>Mean plaque</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td>1.7</td>
<td>0.475</td>
</tr>
<tr>
<td>2 weeks</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>3 Weeks</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>4 Weeks</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>5 Weeks</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>7 Weeks</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>8 weeks</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>9 Weeks</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>10 Weeks</td>
<td>0.9</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: Mean plaque index of manual tooth brush**

P-value >0.05

<table>
<thead>
<tr>
<th>Time</th>
<th>Mean plaque</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week</td>
<td>1.9</td>
<td>0.571</td>
</tr>
<tr>
<td>2 weeks</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>3 Weeks</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>4 Weeks</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>5 Weeks</td>
<td>1.4</td>
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</tr>
<tr>
<td>6 weeks</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>7 Weeks</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>8 weeks</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>9 Weeks</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>10 Weeks</td>
<td>0.8</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Mean plaque index of powered tooth brush**

P-value >0.05

**Table 3: Inter group comparison between manual tooth brush and powered tooth brush by one way annova was highly significant (P≤0.0001), and Pearson correlation of manual tooth brush and powered tooth brush**

<table>
<thead>
<tr>
<th>F-test</th>
<th>p-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE 1 AND TABLE 2</td>
<td>9.8</td>
<td>0.000</td>
</tr>
<tr>
<td>Pearson correlation of manual tooth brush and powered tooth brush</td>
<td>p-value</td>
<td>Pearson(r)</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.966</td>
</tr>
</tbody>
</table>

**Figure 2: means of plaque related to the time of diagnosis by manual tooth brush normal**

**Figure 3: means of plaque related to the time of diagnosis by powered tooth brush normal**
Discussion

The primary tool in overall plaque control in The toothbrush alone has long been considered. Adelivery vehicle such as fluoride, tartar, consider as breath control components of The dentifrice, the bacterial plaque consider as amain etiologic factor of periodontal disease. The studies of Loe and his associates have clearly demonstrated that bacterial plaque is a major etiologic factor in inflammatory periodontal disease.

The use of the toothbrush is not effective with a high standard of oral hygiene. Adults, with suitable method, appear not to be as effective in their plaque removal as might be expected. Most individuals only elemenating about 50% of plaque by tooth brushing.

The plaque has been reduced to almost 49% for brushing by manual tooth brush {P-value >0.05} and 60% by powered tooth brush {P-value >0.05}. highly significant differences were noted between these groups. The efficacy of plaque removal has been approved more with powered tooth brush rather than manual tooth brush.

I could agree with Dr. Perry, but I would appreciate comments from anyone on the panel. the way that we have analyzed the literature in the field I have some concerns. The results of some 60 studies favored the powered brush, and there was no difference in another 40 studies. In this particular field. We all know how much more difficult it is to publish studies which show no differences between the test groups.

Dr. Heasman, I could not agree more. In the Rotadent study, the way that we have analyzed the literature in the field there were no surrogate markers, only tooth loss at the end of the 10-year period. More studies are how effective these brushes are in maintaining dentitions intact and keeping dentitions functional and aesthetic needed over a longer period to provide a clearer view.

Conclusion

This study showed that This program conducted 10 weeks s were more effective than those conducted at six-week intervals in improving oral health knowledge, regarding plaque index, powered tooth brush has more effect than manual tooth brush in removing plaque and calculus. People buy tooth brush with or without dentifrice not only to clean the teeth, but also for its content of an anti-caries action, desensitizing effects, for the feeling of freshness and to reduce malodor.

Conflict of Interest: The author has no disclosures to report.

Source of Funding: Self.

Ethical Clearance: Not required.

REFERENCES


Prevalence of Gram Negative Bacteria Isolated from Patients with Burn Infection and their Antimicrobial Susceptibility Patterns in Kirkuk City, Iraq

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¹Department of Basic Science, Faculty of Dentistry, ²Department of Pharmacology and Toxicology, College of Pharmacy, University of Kirkuk, Kirkuk, Iraq

ABSTRACT

Burn injury compromises the skin barrier and enables bacterial infection, hence delaying burn wound healing. This study aimed to determine the microbial profile of burn wounds, and resistance patterns of microbes with respect to the source of the injured patient’s wound. From 130 wound swab samples were collected from burn patients at Azadi Teaching Hospital, Kirkuk/Iraq. Sterile swabs moistened with sterile saline were used to swab burn wounds. The swabs were plated on blood agar and MacConkey agar for 24 hrs at37°C. Biochemical tests were carried out on the representative isolate on each plate, and antibacterial sensitivity pattern was determined using the Kirby-Bauer disc diffusion method. The study revealed that the main source of burns was gas flames (60%) and scalds (29.23%). Out of the 130 samples analysed, (72.3%) were culture positive and 27.7% were culture negative for bacteria. The predominant gram negative bacteria isolated were, Pseudomonas aeruginosa 40(42.5%) followed by Klebsiella pneumoniae 23 (24.46%), Enterobacter cloacae 21 (22.34%) and Escherichia coli 10(10.63%) were the least frequently isolated bacteria. These isolates showed high resistance towards Beta lactam antibiotics and showed varying resistance levels towards non beta lactam antibiotics (Ciprofloxacin Amikacin and Gentamicin). Resistant gram negative bacteria are the most common isolates associated with burn wounds. Hence a careful selection of antibiotics to control the wound infection is required for proper management of burn wounds in order to help reduce morbidity and mortality.

Keywords: burn wounds, gram negative bacteria, antibiotic resistance, Flame.

Introduction

Burns wounded considered as a suitable site for multiplication of bacteria and are more frequently sources of infection than surgical wound, mostly because of larger area involved and longer duration of stay in hospital¹. Approximately 75% of the mortality after burn injuries is concerned with infections rather than hypovolemia and osmotic shock². The infection patterns are various from hospital to hospital; the varied bacterial flora of infected burn wound may change significantly during the healing period³. Hence such studies are too important for providing suitable and efficient treatment for reducing the rate of morbidity and mortality in Burn Units. Universally, burns are destructive forms of trauma in patients with significant thermal injury⁴,⁵. They can be caused by thermal, scalds, electrical, chemical agents or gas⁶. Patients with such burn injuries require urgent specialized care to decrease bacterial infection, which is considered as critical cause of morbidity and mortality for burn patients⁷.

Much progress are made to infection control systems and burn injury management, in spite of that, burn infection still constitutes a serious clinical challenge in most developing countries, where wound site infections considered as major source for infections, causing post-operative illness and mortality for burn patients⁸. There are significant effects on burn wounds that are...
contaminated with pathogenic bacteria that can delay the wound healing, because of herniation, breakdown or complete dehiscence of the wound\textsuperscript{9,10}.

Almost, the source of contamination is the patient’s normal flora or exogenous contamination from the hospital environment; different groups of bacteria have been reported to be related with wound infections\textsuperscript{11}.

Antibiotic susceptibility patterns for pathogenic isolated bacteria from hospitalized patients are constantly evolving, and this can constitute a significant challenge for clinicians treating burn injury victims\textsuperscript{12,13}. Therefore, this study was made to determine the microbial profile of burn injuries, the antibiotic susceptibility patterns of bacteria associated with the source and degree of burn, age, and sex among burn wound patients at Burns Unit of Azadi Teaching Hospital in Kirkuk city in Iraq.

**Methodology**

The investigation was a cross-sectional study carried out at the Burn Unit of Azadi Teaching Hospital in Kirkuk, Iraq. All consenting burns patients admitted to the Burn Unit from January–July, 2017 were recruited and included in the study.

**Sample Collection:** A total of 130 burn wound swabs were collected, using a sterile cotton swab, and immediately transferred under aseptic conditions to Microbiology Laboratory where they were processed. Data on gender, age and type of burn also collected from the patients.

**Laboratory Analysis:** On arrival at the laboratory, the wound swabs were immediately cultured onto blood and MacConkey agar then incubated at 37°C for 18-24hrs. After 24 hrs, the colonial morphology of the color, shape and general appearance of the individual colony on each of the plates was examined.

A representative single colony on the blood and MacConkey agar was gram stained and tested with citrate, indole, urease, Triple Sugar Ion test (TSI), and oxidase were performed to identify which bacteria species were present\textsuperscript{14}.

**Susceptibility Testing:** Antibiotic susceptibility testing done by Kirby Bauer disc diffusion method as per CLSI\textsuperscript{15}.

Each gram-negative isolate tested using ten antibiotics:

- Amoxicillin (10μg), Augmentin (10μg), Cefotaxime (30μg), Ampicillin (10μg), Ceftriaxone (30μg), Ceftazidime (30μg), Imipenem (10μg), Ciprofloxacin (5μg), Amikacin (30μg) and Gentamicin (10μg).

**Data Analysis**

The data obtained from the study were analysed using descriptive Statistics generated with the help of Microsoft Excel. The quantitative data analyzed using GraphPad Prism software, version 6. In all cases, P-values less than 0.05 considered statistically significant.

**Results**

130 samples collected from the burn patients, 50 (38.46%) were from males and 80 (61.53%) were from females (Table I). The greater number of patients were within the 21-30 age group (32.3%), followed by 0-10 (30.76%), 11-20 (16.92%), 31-40 (6.62%), 51-60 (6.15%), 41-50 (3.84%), and the 61-70 age group had the least number of patients (3.07%). Gas (flame) were the main cause of burn injuries in 78 (60%) patients, followed by Scalds 38 (29.23%) and electricity 14 (10.76%).

<table>
<thead>
<tr>
<th>Age Groups (yrs.)</th>
<th>No. of patients (%) (n = 130)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>40 (30.76%)</td>
</tr>
<tr>
<td>11-20</td>
<td>22 (16.92%)</td>
</tr>
<tr>
<td>21-30</td>
<td>42 (32.3%)</td>
</tr>
<tr>
<td>31-40</td>
<td>9 (6.62%)</td>
</tr>
<tr>
<td>41-50</td>
<td>5 (3.84%)</td>
</tr>
<tr>
<td>51-60</td>
<td>8 (6.15%)</td>
</tr>
<tr>
<td>61-70</td>
<td>4 (3.07%)</td>
</tr>
</tbody>
</table>

**Gender of total patients**

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE</td>
<td>80 (61.53%)</td>
</tr>
<tr>
<td>MALE</td>
<td>50 (38.46%)</td>
</tr>
</tbody>
</table>

**Mechanism of burn injury**

<table>
<thead>
<tr>
<th>Mechanism of burn injury</th>
<th>No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas (Flame)</td>
<td>78 (60%)</td>
</tr>
<tr>
<td>Scalds</td>
<td>38 (29.23%)</td>
</tr>
<tr>
<td>Electricity</td>
<td>14 (10.76%)</td>
</tr>
</tbody>
</table>

Table I: Demographic characteristics of recruited burns patients
Out of the 130 samples cultured, 94 (72.3%) were positive for bacterial growth, while 36 (27.7%) showed no growth in cultures. The majority of positive bacterial growth were from second burn degree 56 (59.57%), followed by third burn degree 35 (37.23%) and first burn degree 3 (3.19%) (Table II).

In this study 4 different predominated isolates of gram negative bacteria were identified (Table III), Pseudomonas aeruginosa 40 (42.5%) followed by Klebsiella pneumoniae 23 (24.46%), Enterobacter cloacae 21 (22.34%) and Escherichia coli 10 (10.63%) (Table III).

Four main isolates of gram negative bacteria were high resistant to beta lactam antibiotics (Amoxiclavulanic acid, ampicillin, amoxicillin, ceftriaxone, ceftazidime, cefotaxime and imipenem) except 5 (23.8%) of Enterobacter cloacae isolates and 1 (9%) of Escherichia coli isolates were resistant towards imipenem.

Also the bacterial isolates were resistant to aminoglycosides antibiotics (amikacin and gentamicin), except 8 (38.09%) of Enterobacter cloacae isolates were resistant towards amikacin and all isolates of Escherichia coli were sensitive towards it (Table III).

Discussion

This study reports for the prevalence of burn injury and associated resistant bacteria in patients in Azadi teaching hospital in Kirkuk, Iraq.

In this study, the prevalence of burn injuries was higher in females: 80 (61.53%) compared with 50 males (38.46%). This agreed with a study proceed by Forson in Ghana which also reported a higher prevalence of burn injuries in females (64%) than in males (36%). The relatively higher rate of burn injuries in females may be due to their greater participation in kitchen activities. However, our results are in contrast to a study by Ekrami and Kalantar from India, which showed a higher rate (59.3%) of burn injuries in males than in females (40.6%)16.

The studied patients’ age ranged from 1 to 62 years of age, the 21-30 age group was the most burn injured age group - which agreed with the study by Chaudhary et al. in Nepal17. This could be because of the fact that the 21-30 group is the most active group, and most involved in outdoor activities. Seventy-eight (60%) of the studied patients had flame injury, while 38 (29.23%) had scald injury and 14 (10.76%) had electrical injuries. These findings were agreed with a study by Shahzad et al in Pakistan18, which reported the main burn cause was gas flame (76%), followed by scald (14%), contact (6%), electrical (3%) and chemical (1%).
Among the patients cultures 94 (72.3%) were positive cultures, most of them 36 (27.7%) were from second degree burn patients.

The most predominant gram negative bacteria associated with burn injuries were *Pseudomonas aeruginosa*, *Klebsiella pneumonia*, *Enterobacter cloacae* and *Escherichia coli*. *Pseudomonas aeruginosa* was the most common bacteria associated with the burn injuries. The high prevalence of *Pseudomonas aeruginosasa* in this study may be because of the fact that it thrives well in a moist environment. Our findings agreed with the studies by Forsan and Lakshmi et al. from Ghana and India respectively, which also reported *Pseudomonas* sp. as the most common isolate in burn injuries with a prevalence of 33.6%. This study, however, is in contrast to study by Srinivasan et al. in India that reported *Klebsiella* sp. (33.91%) to be the common isolate associated with burn injuries. The differences in isolated bacterial isolates in burn wounds may be because of the variation in treatment practices in various geographical locations of burn victims.

In this study, the antibiotic susceptibility pattern of various gram negative isolates from the burn patients showed high resistance toward B-lactams antibiotics, this has emerged through production of β-lactamase, alterations in the targets of antimicrobial agents, the penicillin-binding proteins also through alterations in outer membrane permeability of the bacteria toward the drugs.

Also the isolates emerged high resistance toward aminoglycosides, this emerged through three mechanisms: production of aminoglycoside modifying enzymes, alterations at the ribosomal binding sites or reduced uptake or decreased cell permeability. While bacterial resistance toward ciprofloxacin can occur through various mechanisms: alterations of the cell permeability, changes or alterations in the site of action leading to loss of susceptibility to the antimicrobial drugs mediated by the increment of the efflux pump activity and by enzymatic degradation of the antimicrobial agents.

**Conclusion**

Findings of this study were that multidrug resistant gram-negative organisms are the most common isolates from burn patients. So the study suggest a careful selection of antibiotics to treat burn wound infection is required for proper management of these wounds to reduce morbidity and mortality associated with multiresistant bacteria.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not required.

**REFERENCES**


The Intensity of Pain in Neonates Undergoing Venipuncture Procedures in the Neonatal Ward

Siti Yuyun Rahayu Fitri¹, Mohammad Juffrie², Lely Lusmilasari³

¹Department of Pediatrics Nursing, Faculty of Nursing, Universitas Padjadjaran Bandung Indonesia; ²Department of Pediatrics, Faculty of Medicine, ³Department of Pediatric Nursing, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada

ABSTRACT

A pilot survey is needed about the level of pain due to painful procedures in neonates in order to develop pain treatments in neonates. This study aimed to know the level of pain intensity in neonates underwent blood collection procedures in the neonatal ward. The design of this study was descriptive observational. Instrument used The Premature Infant Pain Profile-Revised (PIPP_R). The samples were neonates who underwent venipuncture procedure treated in the neonatal ward with 88 babies. The results showed that most babies performed moderate pain levels (89.8%). The experience of recurring pain in the neonatal period has potential physiological and psychological problems both in the long and short term. Based on this study, it is important for clinicians in the neonatal room to anticipate pain and develop pain management in neonates who have invasive procedures.

Keywords: neonates, pain, venipuncture

Introduction

Survey research in various countries has been conducted to identify the prevalence of pain in neonates during treatment. A survey of 14 NICUs in Canada showed that each neonate received an invasive procedure of 2 to 8 procedures every day (1). In another study it was shown that 144 neonates experienced more than 7,000 procedure procedures since being treated until returning home (2). In France, of the 430 neonates who were treated, they experienced painful procedures totaling 30,018 procedures, and 30,951 procedures that caused stress, the condition occurred in the first 14 days of treatment. Furthermore, still in France, based on a multicenter prospective study related to epidemiology of neonatal pain, it was shown that the most invasive procedure was heel stick, which is an average of 16 times per baby for 14 days of treatment (3). Another study reported that there were 20,000 painful procedures in 151 neonates for 14 days treated at the NICU, or an average of about 196 procedures per neonate (4).

According to the International Association for the Study of Pain (IASP), pain is an unpleasant sensory and emotional experience related to actual or potential tissue damage (5). Pain that appears in neonates can have an impact on various aspects both short and long term. The impact of pain in neonates began to be investigated in 1996, after the previous years were only seen in experimental animals (6). Pain that occurs in neonates can have an impact on increasing physiological pain sensitivity, intra vascular hemorrhage (IVH) or Ischemia Leading to Periventricular Leucomalacia (PVL), sequelae in neurodevelopment (7) neurobiological changes (CRF, HPA, brain activity), behavior changes in the future such as emotions, depression, reactions when playing, even psychopathology (8). Developmental changes in cognitive and motoric abilities that were poor at 8 and 18 months of age were also associated with the experience of getting invasive procedures that recur during neonates (9). Then it is generally said that pain in the neonatal...
period has an impact on aspects of neurobiology, HPA axis and behavior \(^{(10)}\). Poorly managed pain has an effect on brain development and stress systems of premature neonates, but pain management is still a challenge \(^{(9)}\).

Prevention and treatment of pain in neonates is very important given the impact of short-term and long-term pain in various aspects. But in fact, of the many procedures that cause pain, management of pain carried out by health workers is still very limited \(^{(3,9,11)}\). The average administration of analgesia in neonates with invasive measures is only about 27.4% and further studies have reported that administration of analgesia in neonates given invasive both pharmacologically and non-pharmacologically is only about 20.8% \(^{(12)}\).

In Indonesia, attention to research on pain in neonates began to develop. However, there are no data on the level of pain in infants that has been formally measured. This research is a pilot to survey the level of pain of neonates who performed blood collection procedures. Based on observations in the neonatal ward, blood collection procedures (venipuncture) are invasive procedures that are most commonly performed on treated neonates. This pilot study will be the basis for pain management as well as an overview of the quality of life for neonates who are undergoing treatment at the hospital.

**Material and Method**

This was a descriptive observational study. The pain was measured by use of the Premature Infant Pain Profile-Revised (PIPP-R) instrument which assesses pain from behavioral and physiological aspects and modification variables \(^{(13)}\). Pain indicators include (i) Behavior aspects: brow bulge, eye squeeze, nasolabial furrow, (ii) Physiological aspects: heart rate and oxygen saturation, (iii) Contextual: gestational age and behavioral state. Within the scale, a score of 0-6 points indicates mild pain, 7-12 points indicates moderate pain, and 13-21, points indicates severe pain \(^{(14)}\).

Before the use of this instrument, the translation process was first conducted, namely the process of obtaining devices in different languages with the original language to achieve the same targets in various countries or cultures.

Procedure: Before the venipuncture procedure was carried out, the nurse begins to attach the oximeter to the baby’s soles of the foot, after the oximeter shows the display, then the nurse in charge of blood sticks the needle to get the desired blood sample. To assess the intensity of the pain, a PIPP-R scoring form has been provided. To assess the aspect of the behavior according to the indicator, the nurse observes the behavior and uses the stopwatch for its duration, then for the physiological aspects the measurement of HR and SaO2 uses a non-painful neonatal Oximeter according to the principle of atraumatic care, and for the contextual aspect (gestational age and behavioral state) by looking at medical records and observations. The suitability coefficient between rater was calculated and showed a good level of suitability (ICC = 0.968, p = 0.001).

The sample in this study was the babies who were to take blood sampling procedures in the period June - August 2018 and it was recruited 88 babies.

**Findings**

Babies who were the subjects in this study were all babies who were treated in the neonatal ward at the above 32 week gestational age and were not restricted based on maturity because the use of PIPP-R measuring instruments would correct the effect of age (table 1). The results showed that the level of pain in newborns undergoing venipuncture procedures was mostly at the Moderate level (table 2). When described in the scores obtained, the pain score range is between 6 to 13 points and most are in score 9 (diagram 1).

<table>
<thead>
<tr>
<th>Table 1: Clinical characteristics of newborns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
</tr>
<tr>
<td>Postnatal age (days)</td>
</tr>
<tr>
<td>Birth weight (grams)</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Category of newborns pain on venipuncture procedural</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pain category</strong></td>
</tr>
<tr>
<td>Mild</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>Severe</td>
</tr>
</tbody>
</table>
Discussion and Conclusion

This study was the first study to investigate pain scores using PIPP-R in infants who underwent venipuncture procedures in Indonesia. The results showed that the majority of infants who received venous blood collection procedures were at a moderate level, which was between the scores of 7 to 12. Then based on the distribution of the obtained score data, the lowest pain level was at the highest limit for that category, i.e. score 6 of a maximum of 6 mild category. For the severe category the score is at the lowest limit for that category which is 13 points. The results of current study are generally in accordance with previous studies which showed that venipuncture procedures without analgesic treatment were at moderate and severe levels (15).

Invasive procedures in infants including venous blood sampling (venipuncture) are often performed on infants repeatedly for various purposes at different times. Even in one procedure, the newborn vein is usually not always getting blood so the stabbing is done several times to get the required blood sample. Epidemiological studies in France showed that in a period of 14 days of treatment, 430 infants received a heel stick procedure of 8396 measures and a venipuncture of 757 (12). Then another study showed that within 14 care days 6832 infants received 42,413 invasive procedures with an average of 7.5-17.3 per neonate per day (10).

The experience of repeated pain in infants if not given treatment can cause problems both in the long term and in the short term. The effects of the pain include decreased infant weight and head circumference, reduced white matter and subcortical gray matter, increased heart rate, reduced brain size, mostly in frontal and parietal regions, elevated cortisol levels, neurological behavior and psychological (17–20).

Invasive action is not possible at all and pain will still be felt by neonates. This study can provide an overview to clinicians and health staff working in the neonatal space to become the foundation in developing interventions that can reduce pain, implement it and make policies that support the provision of analgesia in neonates who undergo painful procedures both pharmacologically and non-pharmacologically.

Conflict of Interest: Authors report no conflict of interest.

Source of Funding: It was funded by Ministry of Research, Technology and Higher Education of the Republic of Indonesia.

Ethical Clearance: This study was approved by Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Gadjah Mada University-DR. Sardjito General Hospital (Ref: KE/FK/1193/EC/2017).

REFERENCES


The Quality of Service at Hospital Based on Servqual Approach

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ABSTRACT

This study aimed to analyze and formulate a strategy to improve quality of service at the inpatient care unit of Anuntaloko Parigi Hospital based on a servqual approach. This research was an analytical study with a cross-sectional design, where the data analysis is derived from facts that have occurred or are taking place in the study population. The method used in this study was a survey on 96 patients and 24 officers. The results showed that the level of quality of service at the inpatient care unit at Anuntaloko Parigi Hospital was very low or not qualified. There was a significant relationship in 5 (five) dimensions of quality of service experienced by patients, there was a significant relationship in 2 (two) dimensions of quality of services, namely, reliability and responsiveness, between the services expected by patients and quality of service, and on the dimensions of tangible, there was no significant relationship regarding to reliability and empathy. There was a negative gap between the services expected and perceived by patients. Last, the service dimension that affected the quality of service was responsiveness.

Keywords: Quality of Services, Servqual Approach, Hospital

Introduction

Health state is the will of all parties, not only by person or family, but also by groups and even by all members of the community. Health is a healthy condition, both physically, mentally, spiritually and socially, which enables everyone to live productively socially and economically.(¹,²)

Quality must begin with customer needs and end with costumers’ perceptions. The same is true for services provided by hospitals as providers of health services. Hospital quality can be valued based on patient perceptions. (³) Factors evaluated by consumer which are the key factors determining the quality of services are access, communication, competence, courtesy, credibility, reliability, responsiveness, security, understanding, and tangibles. Based on the study, there is a strong correlation between communication, competence, courtesy, credibility, security which eventually are combined into assurance dimension. (⁴–⁶) Likewise, there is a very strong correlation between access and understanding, which eventually are combined as empathy dimension. (⁷) Consequently, there are five dimensions of quality of service used to evaluate a service, namely reliability, assurance, tangible, emphaty, and responsiveness (RATER). (⁸,⁹)

The aforementioned indicators of hospital service performance may illustrate that there is a tendency to decrease the level of performance, possibly due to the lack of efficiency of services provided to patients. (¹⁰,¹¹)

Based on data from Anuntaloko Parigi Hospital, the number of inpatients in 2008 was 6,429, with an average of 536 patients per month. The number of hospitalized patients in 2009 was 6661 people, with an average of 555 patients per month. The total number of patients in 2010 was 22,215 people, and the number of hospitalized patients in 2010 was 6,597 people, with an average of
549 patients per month. Meanwhile, the data for 2011 from January to July were 3397 with an average of 485 patients per month. Based on data from inpatients from 2008 to 2010, it was found that there had been a decline in the number of inpatients as many as 168 people.

Considering the decrease in utilization rates in Anuntaloko Parigi Hospital which might be affected by patient/customer dissatisfaction to the low quality of perceived service, it was necessary to make an analysis of the quality of services at Anuntaloko Parigi General Hospital, especially in inpatient services with a servqual approach which will then be made into a strategy for service improvement using the importance and performance matrix.

Method

This study was quantitative with cross sectional study approach. The study was done at the inpatient care unit at Anuntaloko Parigi hospital from December 2016 to March 2017. The population was all hospitalized patients at inpatient care unit of Anuntaloko Parigi hospital as well as all the officers working in service units at Anuntaloko Parigi hospital. A purposive sampling technique was employed with a sample size of 24 officers respondents and 96 patient respondents which was calculated through an estimated proportion formula:

\[ n = \frac{(Z_{1-\alpha/2})^2 \cdot (P)(1-P)}{d^2} \]

The data were collected by means of questionnaire for each officer and patient and were analysed using chi square and logistic regression analysis.

Results

The most influential dimension toward the quality of service

Table 1: Logistic regression analysis between patients’ willingness and quality of service at inpatient care unit at Anuntaloko Parigi hospital

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>-69.945</td>
<td>63550.12</td>
<td>0.000</td>
<td>0.999</td>
<td>0.000</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>-3.515</td>
<td>1.308</td>
<td>7.215</td>
<td>0.007</td>
<td>0.30</td>
</tr>
<tr>
<td>Assurance</td>
<td>45.920</td>
<td>49225.806</td>
<td>0.000</td>
<td>0.999</td>
<td>9E+019</td>
</tr>
<tr>
<td>Empathy</td>
<td>45.920</td>
<td>49225.774</td>
<td>0.000</td>
<td>0.999</td>
<td>9E+019</td>
</tr>
</tbody>
</table>

Table 1 shows that among four independent variables, regarding to patients’ willingness, only the responsiveness dimension has a significant influence on the quality of inpatient unit services at Anuntaloko Hospital Parigi.

The gap on quality of services

Table 2: The gap between perceived and expected services by patients based on importance score on five service dimensions at inpatient unit at Anuntaloko Parigi hospital

<table>
<thead>
<tr>
<th>Dimensions of the quality of service</th>
<th>Averaged scores</th>
<th>GAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Perceived</td>
<td>Expected</td>
</tr>
<tr>
<td></td>
<td>services</td>
<td>services</td>
</tr>
<tr>
<td>Tangibles</td>
<td>9.71</td>
<td>14.39</td>
</tr>
<tr>
<td>Reliability</td>
<td>12.47</td>
<td>17.47</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>9.85</td>
<td>14.13</td>
</tr>
<tr>
<td>Assurance</td>
<td>9.92</td>
<td>14.38</td>
</tr>
<tr>
<td>Empathy</td>
<td>12.43</td>
<td>18.02</td>
</tr>
</tbody>
</table>

Table 2 shows the biggest negative gap was true for empathy dimension (-1.17) and the least was responsiveness dimension (-0.89). These results indicated that of the five dimensions, the quality of perceived services was lower than what was expected at the inpatient care unit at Anuntaloko Parigi hospital.
Table 3: The gap between perception of officer and services provided to the patients based on five dimensions of the quality of service at the inpatient unit at Anuntaloko Parigi hospital

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Averaged scores</th>
<th>GAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provided services</td>
<td>Perceived services</td>
</tr>
<tr>
<td>Tangible</td>
<td>11.96</td>
<td>13.92</td>
</tr>
<tr>
<td>Reliability</td>
<td>15.13</td>
<td>17.50</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>12.50</td>
<td>13.79</td>
</tr>
<tr>
<td>Assurance</td>
<td>12.50</td>
<td>14.58</td>
</tr>
<tr>
<td>Empathy</td>
<td>15.13</td>
<td>16.67</td>
</tr>
</tbody>
</table>

Table 3 shows the biggest negative gap was true for reliability dimension (-2.37) and the least was responsiveness dimension (-1.29). These results indicated that the quality of services provided by officer was lower than what was perceived by patients.

The importance–performance analysis: Regarding to strategic plan to improve the quality of services, the average scores of importance and performance of all five dimensions were made into the following importance-performance matrix.

![Graph 1: The analysis matrix of importance and performance at the inpatient unit of Anuntaloko Parigi hospital in 2012](image)

Graph 1 shows there were 7 attributes of the quality of services in quadrant I, 4 attributes in quadrant II, 3 attributes in quadrant III and 8 attributes in quadrant IV.

Discussion

Over expectation of patients toward the health service was among the factors influencing the low quality of services. However, the most influential factor of the quality of services perceived by the patients was the low performance of officer. According to the interview made by the researcher, the quality of service perceived by patients was lower that what was expected, for instance the unfriendly attitude of officer and the absence of officer in the room when needed.

Analysis of the influence of experience and patients expectation over the quality of service: The quality of service that was significantly related to expected service quality and tested by logistic regression analysis was the responsiveness dimension. This means that only the attributes in the service dimension are the main indicators to measure the quality of health services in the inpatient unit of Anuntaloko Parigi Hospital. On the
other hand, service improvements in the dimensions of reliability, assurance and tangible did not have a large leverage to the high perceptions of patients toward the quality of service.\textsuperscript{(18)}

Improving service attributes in the dimension of responsiveness, therefore, must be a top priority to improve quality at the inpatient unit of Anuntaloko Hospital, Parigi. Graph 1 shows the service attributes that should get priority on responsiveness, for instance; officers must be responsive to each patient’s complaints, having an attitude of always wanting to help patients, providing information to patients that must be clear and understandable and not making any burden of any complaints or wishes of patients.

\textbf{The gap analysis of the quality of services:} The difference between actual performance (perceived services) and consumer perception on the expected quality of service was based on five service dimensions in service quality model (servqual), namely tangible, reliability, responsiveness, assurance, and empathy.\textsuperscript{(8,19)}

The results of the study showed that attributes such as service procedures which are fast and easy, on time services, sincere attention and the ability of officers to provide services without errors are very important and expected by patients. Other important service conditions are expected by patients, namely the special attention of officers to patients, officers are not discriminatory in providing service and always treat patients well.\textsuperscript{(20–22)} Ironically, the officers could not perform better performance on these dimensions. This means that there was a dimension of service that was importantly expected by the patient, however the officer actually showed poor performance on that dimension and vice versa there was a dimension that was not too expected and emphasized by the patient but precisely the officers showed good performance on that dimension.

The aforementioned gaps arose due to management/officer misperception of the service expected by the patient (gap 1).\textsuperscript{(23,24)} As is shown in Table 4, there was a gap between the perceptions of officers on the services expected by patients and actual patient expectations. Another reason is because the hospital service quality indicator instrument (hospital accreditation system) has not been oriented to customer satisfaction, the quality of service cannot be assessed from the service provider’s point of view but must be based on the customer’s assessment (voice of customer).\textsuperscript{(25,26)} However, these four factors can actually be controlled by service providers, indicating that the occurrence of a negative gap between services received and those expected by patients is highly dependent on the performance of the officers.\textsuperscript{(15,18)}

Understanding the problem, therefore, the strategy to improve the quality of service in the inpatient unit of Anuntaloko Parigi Hospital must be prepared based on the expectation of patients. In addition, management must always improve the quality of officers, especially those related to service management, development of attitudes and characteristics of officers so that they are able to understand better and feel about what is felt by patients.

\textbf{Strategy to improve the quality of services at the inpatient unit of Anuntaloko Parigi hospital:} The results implied determination of position to assign research attributes with a Cartesian diagram. The strategy for improving services in this paper was based on the importance and performance matrix consisting of 4 quadrants as follows:

1. The attributes included in quadrant I located in the upper left (service attributes that were considered very important, but hospital management had not implemented it according to the expectation of the patient) are:
   a. The hospital yard is clean and beautiful
   b. The hospital layout and furnitures are clean, neat and comfortable
   c. Officer service provides security to the patients
   d. Officers are able and willing to give appropriate answer toward questions and complaints of patients.
   e. Officers care to the patients and their family
   f. Officers provide equal services without any discrimination to the patients
   g. Officers always treat patients well
2. The attributes included in quadrant II located in the upper right (service attributes that were considered very important by patients and had been implemented by hospital management and met patients satisfaction) are :
   a. Medical equipments are complete, clean, and ready-to-use
b. Services are fast and punctual  
c. Officers are polite and friendly  
d. Officers patiently and carefully treat the patients

3. The attributes included in quadrant III located in the bottom left (service attributes that were not considerably important by patients and the implementations by hospital management were mediocre and less satisfying) are:
   a. Officers give error free service  
b. Officers provide clear and understandable information  
c. Officers do not make burden of any complaint of patients

4. The attributes included in quadrant IV located in the bottom right (service attributes that were not considerably important by patients but the implementations by hospital management were excessive/less important but very satisfying) are:
   a. Officer appearances which are clean and tidy  
b. Patient admission procedures are fast and precise  
c. Services procedures are easy  
d. Officers provide sincere service to any complaint of patients/their family  
e. Officers quickly respond to patients complaint  
f. Officers always want to help patients  
g. Knowledge and ability of doctors to diagnose diseases  
h. Officers provide special care for each patient

Conclusions

This study concludes that the level of quality of services at inpatient units at Anuntaloko Parigi Hospital is very low or not qualified. There is a significant relationship on the 5 (five) dimensions of quality of services experienced by patients. There is a significant relationship in 2 (two) service quality dimensions, namely (reliability and responsiveness) between the services expected by patients and the quality of services. With respected to the Tangible, Reliability and Empathy dimensions, there is no significant association is found. There is a negative gap (gap-) between services expected and perceived by patients. Responsiveness has the most influence on the quality of service.

This research recommends the need for developing cooperation among professional institutions in research and improvement of customer-oriented management. The rationalization of the price rates of Anuntaloko Parigi Hospital is based on the ATP/WTP study.

Ethical Clearance: Our study was not directly applied on human, hence ethical clearance was not required

Source of Funding: Self funding

Conflict of Interest: The author declare that he has no conflict of interest

REFERENCE

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Serum Vitamin-D Levels in Bronchial Asthmatic Patients in Baghdad City

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¹Technical Institute, Suwaira-Middle Technical University, Wasit, Iraq; ²Health and Medical Technology College, Middle Technical University, Baghdad, Iraq

ABSTRACT

Objective: Several preceding reports have indicated the association between vitamin-D levels and bronchial asthma. Nevertheless, a small number of studies in Iraq had concentrated on vitamin-D serum concentration in a such population. The presented study will examine the main association between bronchial asthma and vitamin-D levels in a randomized asthmatic individuals.

Method: Cross-sectional study included 61 asthmatic patients (26 females and 35 males) who attended Chest Diseases Department in AL-Zahraa Center (Baghdad) for Asthma and Allergy between August 2017 and April 2018, their ages ranged from 6 to 18 years. All subjects were submitted to estimation some of anthropometric measurements including; body mass index (BMI), full medical history, routine laboratory investigations and clinical examination by qualified physician, serum samples of the participants had been analyzed using ELISA for IgE level and ELFA for vitamin-D levels.

Results: Asthmatic participants revealed a significant difference (p<0.05) between levels of vitamin-D according to the genders, both IgE and vitamin-D reflected a significant difference (p< 0.05) among all the four BMI scales that had been used in the recent study and high significant relation of the vitamin-D deficiency with IgE levels among the asthmatic participants (p< 0.001).

Conclusion: Our recent outcomes indicated that there was a vitamin-D deficiency in Iraqi asthmatics patients. Furthermore, deficiency of vitamin-D has been related with elevated abnormal IgE level among asthmatic subjects. So, serum vitamin-D level in asthmatic patients should be surveillance constantly.

Keywords: Asthma, Immunoglobulin-E, Vitamin-D

Introduction

Highly occurrence of asthma and allergic diseases draws a considerable deal of worry¹. There are a lot of impacts related to vitamin-D on innate immune system and the adaptive immune system which could be useful in the primary protection from asthma, modulation of the severity of asthma exacerbations, and reduction or protection against asthma morbidity. Vitamin-D deficiency is detected more and more in general population, and it is mainly based on behavioral, lifestyle and dietary changes.

A novel of studies is firmly established of asthma relates to subnormal of vitamin-D levels. The immune system is very complicated with multiple interfering pathways of vitamin-D as a contributor to the outcome of immune responses in asthmatic patients.²,³ Furthermore, the effect of vitamin-D on airway epithelium, immune cells, bronchial smooth muscles is vital to the asthma pathogenesis.³ Through inhibiting Th17 production or vitamin-D prevent asthma exacerbations as an effective modulator related to the immune system.⁴,⁵ By regulating immune cells differentiation and proliferation.⁶ There is an assumption that vitamin-D change the release of smooth muscle’s chemokine’s in airways via inhibiting the expression of steroid resistant gene. Yet, the assumption has not been proved.⁷ Previous studies indicated that kids experiencing mild to moderate asthma with low vitamin-D concentration had more exacerbations.

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with less asthma control. With low lung functions, more hospitalizations in past year, decreased response to inhaled corticosteroids (ICS), and thus, increased use of ICS. Furthermore, vitamin-D is inversely related with increased airway response to glucocorticosteroids and airway remodeling. Our suggestion is that the patients who experience asthma might have low vitamin-D levels which could be a risk factor and no more details regarding the impact of seriousness of Vit.D insufficiency in patients experiencing asthma. The main goal of the current study was to explore the possible relation among critical deficiency of vitamin-D, BMI and IgE with patients experiencing asthma in Iraqi patients.

Materials and Method

Participants and Study Design: Cross-sectional, study has been performed in AL-Zahraa Center for Asthma and Allergy/Baghdad, Iraq. The study was conducted between August 2017 to April 2018, which consisted of 61 patients experiencing asthma (26 females and 35 males) who have been admitted to Chest Diseases Department.

Questionnaire was set to evaluate the bronchial asthma medical history, anthropometric measurements that involved BMI, height (cm) and weight (kg) by qualified physician for each patient. A local Ethical Committee reviewed and approved the study.

Measurement of IgE and vitamin-D serum levels: Briefly, venous blood sample had been taken from all subjects and centrifuged for collecting sera. All samples tested for serum IgE by the following of manufacturer instructions of commercial enzyme linked immunosorbent assay of (Demeditec Diagnostics GmbH. Germany) with standard range: 5–1000 IU/ml, and serum vitamin-D by the following the instructions manual of enzyme linked fluorescent assay of (BioMerieux. France) using minividas instrument with range: less than (20ng) and more than (100ng).

Statistical Analysis: Chi-squared test was used to assess the association with qualitative variables. Fisher exact was used when Chi –squared test was not suitable. The differences between observations have been significant at p ≤ 0.05.

Results

In table 1, a summarization will be presented regarding the major demographic characteristics related to the participants of the study, stratified vitamin-D levels based on gender. (78.68%) with deficient Vit.D between genders with significant difference (p = 0.04). In contrast, IgE levels had been detected with insignificant difference (p = 0.069).

Table 1: Baseline data of participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Genders\N (%)</th>
<th>Total</th>
<th>p.value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>8 (13.11%)</td>
<td>5 (8.20%)</td>
<td>13 (21.31%)</td>
</tr>
<tr>
<td>≥10</td>
<td>27 (44.26%)</td>
<td>21 (34.47%)</td>
<td>48 (78.68%)</td>
</tr>
<tr>
<td>BMI* Categories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under wt.*</td>
<td>3 (4.92%)</td>
<td>2 (3.28%)</td>
<td>5 (8.20%)</td>
</tr>
<tr>
<td>Normal wt.</td>
<td>10 (16.39%)</td>
<td>6 (6.55%)</td>
<td>16 (26.22%)</td>
</tr>
<tr>
<td>Over wt.</td>
<td>10 (16.39%)</td>
<td>8 (13.11%)</td>
<td>18 (29.51%)</td>
</tr>
<tr>
<td>Obese</td>
<td>12 (19.67%)</td>
<td>10 (16.39%)</td>
<td>22 (36.07%)</td>
</tr>
<tr>
<td>Vit.D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>23 (37.70%)</td>
<td>25 (40.98%)</td>
<td>48 (78.68%)</td>
</tr>
<tr>
<td>Sufficient</td>
<td>12 (19.67%)</td>
<td>1 (1.63%)</td>
<td>13 (21.31%)</td>
</tr>
<tr>
<td>IgE*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>16 (26.22%)</td>
<td>6 (9.83%)</td>
<td>22 (36.07%)</td>
</tr>
<tr>
<td>Abnormal</td>
<td>19 (31.15%)</td>
<td>20 (32.79%)</td>
<td>39 (63.93%)</td>
</tr>
<tr>
<td>Total</td>
<td>35 (57.38%)</td>
<td>26 (42.62%)</td>
<td>61 (100 %)</td>
</tr>
</tbody>
</table>

*BMI (kg/m^2) = Body mass index (Kilogram/meters squares), *IgE= Immunoglobulin E, *NS= Non-significant, *S= Significant, *Vit.D=Vitamin-D, *wt.= weight

Table (2): showed four categories of BMI and the both levels of the studied biomarkers which reflected a significant difference (p< 0.05) among all the four BMI scales that had been used in the recent study.
Table 2: Association of vitamin-D and IgE levels with BMI Categories

<table>
<thead>
<tr>
<th>Biomarkers</th>
<th>BMI Categories N (%)</th>
<th>Total</th>
<th>p.value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under wt.</td>
<td>Normal wt.</td>
<td>Over wt.</td>
</tr>
<tr>
<td>Vit. D</td>
<td>Deficient</td>
<td>4 (6.55%)</td>
<td>16 (26.22%)</td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>1 (1.63%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>IgE</td>
<td>Normal</td>
<td>1 (1.63%)</td>
<td>3 (4.91%)</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>4 (6.55%)</td>
<td>13 (21.31%)</td>
</tr>
</tbody>
</table>

Table (3): revealed high significant relation of the vitamin-D deficiency with IgE levels among the asthmatic participants (p< 0.001).

Table 3: Association of vitamin-D and IgE levels among asthmatic participants

<table>
<thead>
<tr>
<th>Vitamin-D Levels</th>
<th>IgE \ N (%)</th>
<th>Total</th>
<th>p.value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Abnormal</td>
<td></td>
</tr>
<tr>
<td>Deficient</td>
<td>10 (16.40%)</td>
<td>38 (62.30%)</td>
<td>48 (78.68%)</td>
</tr>
<tr>
<td>Sufficient</td>
<td>12 (19.67%)</td>
<td>1 (1.67%)</td>
<td>13 (21.31%)</td>
</tr>
<tr>
<td>Total</td>
<td>22 (36.07%)</td>
<td>39 (63.93%)</td>
<td>61 (100%)</td>
</tr>
</tbody>
</table>

Table (4): estimated the distribution of the asthmatic participants in the current research according to the acuteness of vitamin-D deficiency, it had been detected that most of the patients as 23 (37.7%) complain of sever vitamin-D deficiency and 20 (32.8%) had an optimal vitamin-D concentration. Regarding to the levels of vitamin-D, the participants have been separated into two sub-groups: subgroup I: deficiency of vitamin-D (the levels of vitamin <10-20ng/ml); subgroup II: vitamin-D sufficiency (the levels of vitamin-D ≥30 ng/ml). Based on the stratification of vitamin-D levels, from 61 asthma patients were 48 patients had vitamin-D deficiency.

Table 4: Classification of vitamin-D levels

<table>
<thead>
<tr>
<th>Levels of Vit. D</th>
<th>Range (ng/ml)</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very severe vit. D deficiency</td>
<td>&lt; 5</td>
<td>4 (6.6%)</td>
</tr>
<tr>
<td>Severe vit. D deficiency</td>
<td>5 -10</td>
<td>23 (37.7%)</td>
</tr>
<tr>
<td>Vit. D deficiency</td>
<td>10 - 20</td>
<td>9 (14.8%)</td>
</tr>
<tr>
<td>Suboptimal vit. D level</td>
<td>20 -30</td>
<td>1(1.6%)</td>
</tr>
<tr>
<td>Optimal vit. D level</td>
<td>30 -50</td>
<td>20 (32.8%)</td>
</tr>
<tr>
<td>Upper normal</td>
<td>50 -70</td>
<td>4 (6.6%)</td>
</tr>
<tr>
<td>Overdose (but not toxication)</td>
<td>&gt; 150</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>61 (100%)</td>
</tr>
</tbody>
</table>

Discussion

The current study examined the acuteness of vitamin-D inadequacy. The results indicated that very severe deficiency of vitamin-D in all the subjects were 6.6% and 37.7% as sever vitamin-D deficiency. While, 32.8% (optimal), and 6.6% (normal).

Communication between the hereditary elements and nature of the general population causing the noticeable irritation in air ducts (12,13). Different elements could be had diverse effects for example; allergens, foods, indoor allergens, such as creature allergens, growths, bugs, or open-air regular allergens (dust of trees, grass, and so forth.); synthetic substances; ozone (O3); tobacco smoke; paints; cold air; climatic changes in temperature and barometric weight; lack of hydration; work out; air quality; cold and warmth (14). As referenced, the consequences of the current study have been unmistakably affirmed the connection between asthma and deficiency of vitamin-D. In clarifying discoveries, vitamin-D function in the keeping up the homeostasis related to impact of connection between serum dimensions of vitamin-D with asthma.

Furthermore, there is a suggestion that vitamin-D immunologically interferes with separation and multiplication of B & T cells and keeps emission of immunoglobulins or anti-inflammatory cytokines (14-19). Accordingly, vitamin-D demonstrate sort of inflammatory and immunomodulatory property like in a study which demonstrated that vitamin-D supplementations decreases aggravation of air channels and activation route of high responsive in murine model.
of susceptible asthma, study revealed; inadequacy of vitamin-D connected with less blood T-regs, expanded proinflammatory cytokines, high bronchoalveolar lavage liquid eosinophilia and decreased BALF interleukin 10 levels in lung tissue. In a different study for assessing the impact of vitamin-D intake on neutrophilic and eosinophilic activation route aggravation in patients experiencing non-atopic asthma demonstrated that Vitamin-D lessens eosinophilic aggravation of air ducts and could be useful in treating asthma. In addition to, study demonstrated that vitamin-D has effect onto the airway renovating. Possibly, via expanded sensitivity to corticosteroids drugs, then vitamin-D will decline the eosinophilic aggravation of airway inflammation. Regarding to these issues, different studies demonstrated that the insufficiency of vitamin-D expands the danger of airway hyperreactivity and decreases lung work.

Commonly, the inadequacy of vitamin-D on the planet is epidemiologically pervasive, also high predominance exists in territories with bottomless sun introduction; by taking vitamin-D level of less than (20 ng/ml) as lack of vitamin-D, a study revealed a percentage of inadequacy of vitamin-D in American newborn children/toddlers. Another research in USA indicated the rates of vitamin-D inadequacy and vitamin-D lack in individuals of age between (0 – 21 years) have been accounted for (21%) and (28%), respectively. Iranian, matched results with current study which has been directed with the point of inspecting the insufficiency of vitamin-D in kids of age between (9-12 years) demonstrated that 72.4% contemplated kids experiencing deficiency of vitamin-D.

In this study, highly significant relation has been seen between the IgE serum levels with vitamin-D deficiency. It appears that the connection between vitamin-D and hypersensitive marker (IgE) is autonomous from other powerful factors such as; BMI and genders. A study founded the connection between vitamin-D and indicators of childhood asthma in more than 600 teenagers in Costa Rica. In multiple linear regression study, the outcomes demonstrated an invert and critical connection between IgE levels and vitamin-D. However, a study shows no distinction has been spotted between deficiency of vitamin-D with IgE level. Small sample size was one of the restrictions of the current study, our hypothesis needs further investigation studies to establish the association between the studied biomarkers in asthmatic patients.

The results of the current research propose that serum vitamin-D level of patients experiencing asthma did not follow a typical range. So that, serum vitamin-D level in patients experiencing asthma should be examined constantly.

**Source of Funding:** Nil

**Conflicts of Interest:** Nil

**Ethical Clearance:** A local Ethical Committee reviewed and approved the study.

**REFERENCES**


Micro RNA 141 as a Biomarker for Ovarian Cancer

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ABSTRACT

Ovarian cancer, especially ovarian carcinoma, is a very dangerous form of cancers that affected women and causes severe losses among them. The microRNAs or (miRNAs) are RNA transcripts class that commonly consisted in its length from ~19–22 nucleotides. Those nucleotides altered the miRNA pattern that is responsible for its pathological conditions. The highly stable transcripts are miRNAs-141. Those transcripts are observed from formalin-fixed paraffin-embedded (FFPE). FFPE samples are used to identify microRNAs-141. They are usually used for the purpose of diagnosis and detection of tumors, especially for detection of a very severe malignant tumor, the ovarian cancer. This study was designed for evaluation of the role of miRNA-141 and the importance of miRNA-141 patterns in FFPE samples. Those patterns were obtained from the patients suffered from ovarian cancer. The PCR-array technology was also used for the detection and the comparison of the miRNA-141 differential expression pattern of ovarian cancer. This study concluded that, the miRNA-141 can be used effectively and successfully for predication and detection of the ovarian cancer that facilitated its treatment and curing.

Keywords: microRNAs-141-Ovarian cancer- Formalin-fixed paraffin-embedded (FFPE).

Introduction

Ovarian cancer (epithelial carcinoma) considered as the major and dangerous cancers that affecting women health and its life. The mortality rate of ovarian cancer considered as the highest percent in all gynecological cancers of malignant characters, and its prognosis is commonly poor in its characters (1).

The study conducted by (Zou et al., (17) concluded that the drug resistant was related to microRNA microarray dataset GS54665. The mRNA dataset were obtained from the Gene Expression Omnibus database that involved GSE33482, GSE28646, and GSE15372. The screening of dysregulation of microRNAs was with GEO2R. By real-time quantitative PCR (qRT-PCR), they further obtained in A2780 (A2780/DDP) and SKOV3 (SKOV3/DDP) cells. The drug resistant were associated and analyzed through comprehensive bioinformatics analyses. The differentially expressed microRNAs (microRNA-141) in drug-resistant ovarian cancer cells reached to 10 fragments.

Another study conducted by Keller et al. (8) on microRNA-141. They reported that microRNA-141 altogether involved in the drug resistance regulation in ovarian cancer. They further reported that the nine microRNAs and thirty-eight genes identified numerous signaling pathways related to drug resistant from the annulation of the biological process together with pathway enrichment analysis. A relationship of regulatory between the nine microRNAs and nearly all thirty eight genes was also revealed from the interaction of microRNA-mRNA. By qRT-PCR in SKOV3/DDP and A2780/DDP cells, the expression of nine microRNAs and seven genes indicated consistency in expression profile with the microarrays. Among those, the PI15 and EPHA7 expressions were inversely related with the expressions of microRNA-141, as well as acknowledged as essential targets of microRNA and microRNA-mRNA interaction.

The main method which is currently used for the treatment of ovarian cancer is the surgical interference. This treatment is considered as the primary treatment because it is supplemented with chemotherapy that is delivered to the patient. Platinum-based combination chemotherapy improves many things in women suffering from ovarian cancer i.e. the overall response, clinical relevant, and survival rates. The multiple drug resistance (MDR) primarily considered as the main problem in clinical practice that obstruct the medical treatment of ovarian cancer (11).
Recently, by the using of bioinformatics approaches like biochip data extraction, visual mapping, biological data clustering, promoter prediction, sequence alignment, statistical analysis and pathway analysis, the data about the molecular level can be identified. For examining the molecular pathogenesis of several diseases as well as tumor, several research ideas were provided by those analyses. For example, Yin et al. (16) identified 25 genes through a comprehensive bioinformatics analysis. Those genes (including AKT1/2D) were linked to drug resistance in ovarian cancer. In the research, microarray data detailing microRNA expression profiles and the messenger RNA (mRNA) in drug-sensitivity and drug-resistance which were used in the treatment of ovarian cancer. The ovarian cells of cancer were extracted from the Gene Expression Omnibus (GEO) database (3). The data was analyzed to differentiate the gene expression and microRNAs associations. In the drug-resistant or drug-sensitive against ovarian cancer, the correlation between differentially expressed genes and microRNAs usually investigated by a comprehensive bioinformatics analysis that, included biological enrichment pathway, biological annotation, mRNA-microRNA interaction analysis and differentiation and protein-gene interaction analysis.

The postoperative chemotherapy was considered as the main method for full ovarian cancer treatment. On the other hand, the multiple drug resistance process was considered as the main reason for the failure of the treatment of chemotherapy and curing of ovarian cancer (5).

Previous studies have shown that factors, including differential expression of microRNAs, genes, and microRNA-controlled were linked to the multiple drug resistance in ovarian cancer (4 and 15). The screening, identification of the microRNAs and investigating the relationships between microRNAs differentially expressed and the genes may throw the light on the molecular mechanisms and guide the clinicians by choosing the type of drug treatment protocol and prognosis (9).

By using qRT-PCR, Zou et al. (2015) defined 9 differently expressed microRNAs. They noticed that the microRNA-18b, microRNA199a-3p, microRNA-335, microRNA199a-5p, microRNA199b-3p, microRNA-645, and microRNA-141 expression during analysis in A2780/DDP and SKOV3/DDP cells have similar results as that of microRNA chip obtained by (Yin et al., 16).

Braicuet al. (2), reported that, through MicroRNA-141 regulation and adjustment of Kelch-like ECH-associated protein 1 (KEAP1), microRNA was responsible for adjustment of the drug resistance in treatment of ovarian cancer.

The microRNA-141 and the gene characters can be predicted as the regulatory negative correlations between each other. 2780 ovarian cancer cells were predicted by the microRNA-141 which was characterized by its highly positive expression in drug-resistant. The MicroRNA-mRNA interaction analysis explained that, the potent target genes of microRNA-141 were EPHA7 and PI15. Additionally, the study conducted by (Muresanet al., 13), reported that regulation and adjustment of the drug resistance in treatment of ovarian cancer was significantly associated to the microRNA-141.

Therefore, the objective of the current study was to assess the role of miRNA-141 as a biomarker to identify the ovarian cancer, especially in ovarian carcinoma and dealing with it.

**Method and Materials**

**Study Design and patients:** The present study constituted a multiple stage design, retrospective, nested case-control study for the determination of the serum miRNA levels that either they may be used for predicting EOC development. The patients were separated into screened, trained, as well as validated sets. Total of 100 samples of plasma were included from which 60 were affected cases and 40 were controls.

All the EOC patients exposed to histopathological diagnosis with primary ovarian cancer. The patients included in the current study did not receive chemotherapy or radiotherapy before obtaining the blood sample.

Before surgery, blood samples were obtained from the patients. The patients as well as the controls that were genetically unrelated and free from digestive, respiratory, cardiovascular, reproductive, urinary, and endocrine diseases were included in the present study. On the other hand, the individuals who suffer from those diseases were excluded from the study.

In this study, the protocol was according to the ethics of Center review committees. From all the participants, informed consent was taken. Personal interview was conducted with each participant and informed them. The pre-tested questionnaires were used to get the information about demographic, menstrual history,
reproductive history, family history of cancer, women life style, and environmental exposure. After that, about 3-ml sample of blood was taken from each control and women with disease.

By the use of quantitative reverse transcription-polymerase chain reaction (qRT-PCR), the miRNAs identified in the screening set were examined on the sample of 60 EOC patients and 40 normal controls.

The collection of blood in anticoagulant EDTA tubes was done. The blood then further proceeded for isolation of plasma. At air temperature, blood was centrifuged at 1200 g for 10 minutes. After the centrifugation of blood, the supernatant plasma transferred into another fresh tube. At −80°C, that supernatant plasma was reserved. From all the plasma samples, RNA was separated.

Briefly, 250 µl of plasma was melted and rotated for removing lymphocytes at 14000 g at 4°C for 10 minutes. After that, lyse 200 µl of supernatant fluid.

For screening ovarian cancer biomarker, the plasma pools were used. Samples of pools were created by joining 100 µl of ten samples. At 14000 g, the pool was mixed and rotated for 10 minutes. For RNA isolation, supernatant fluid of about 1 ml was transferred to another tube. 5 µl of 25 fmol synthetic Caenorhabditis elegans miRNA cel-miR-39 was joined to denature every sample for normalization.

MiRNeasy Mini (Qiagen) following the manufacturer’s protocol was used to isolate the RNA. Besides that, in pre-heated 30 µl free of nuclease water, RNA was eluted.

By using TLDA, MiRNA expression of sample of pool was described. The TaqMan miRNA reverse the TaqMan miRNA multiplex RT assaysand transcription kit. Human Pool Set were used for reverse transcription of RNA. Plasma RNA solution of about 9.16 µl was transcribed in RT mixture of about 15 µl. At 16°C, the tubes were incubated for 30 minutes, and then further incubated for 30 minutes at 42°C, following for 5 minutes at 85°C. Before using the TLDA, the TaqManPreAmp master mix kit (Applied Biosystems) increased the number of cDNA obtained for analysis.

By using 15µl final reaction volume the triplicate wells were measured with the following series i.e. at 95°C for 10 minutes, followed by 50 cycles for 15 seconds at 95°C and for 1 minute at 60°C. To compute the relative differences in expression by the method of 2−ΔΔCt having confidence of 95%, the 7900 Sequence Detection System 2.4 software defaults were applied.

Statistical Analysis

The statistical analysis was done on a software i.e. SPSSPC+-version 24. The Independent Sample t-test was applied to measure the control and affected group differences. All statistical tests were two-sided. A P value of <0.05 was regarded as significant.

Results

Patient Characteristics: The samples included in this study reached to 100 plasma samples (60 cases of patient women and 40 control women), the clinical and demographic characters of them were obtained about the women used in the samples and all historical characters were obtained that useful in the diagnosis and useful in the identification of the role miRNA-141 (Table, 1).

Table 1: Incidences of ovarian carcinoma among examined patients

<table>
<thead>
<tr>
<th>Groups</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovarian cancer</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Control normal</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

Chi² = 6.24** ** = Significant at (P < 0.5)

Evaluation of miRNA-141 relative expression in ovarian cancer: 10 ovarian cancer tissue samples and 5 normal ovarian tissue samples by using macro dissected specimens were used. The ovarian cancer patients’ average age was 59.55 ± 3.34 years, whereas, the age of control group was 62 ± 4.49 years.

Table 2: Evaluation of miRNA-141 relative expression in ovarian cancer among normal ovarian cancer groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>%</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovarian cancer</td>
<td>10</td>
<td>59.55 ± 3.34 B</td>
<td>6.26*</td>
</tr>
<tr>
<td>Control normal</td>
<td>5</td>
<td>62.00 ± 4.49 A</td>
<td></td>
</tr>
</tbody>
</table>

* = Significant at (P < 0.05).

In the current study, the first step was to do a comparative analysis of miRNA based on method of ΔΔCt for ovarian cancer tissue and normal control
women. The interest on miRNAs as a cut-off level had 1.5-fold expression difference and a P-value of <0.05 in tissue of ovarian cancer. Ten miRNAs differentially expressed (4 over-expressed and 6 down-regulated).

By using interpretative program Ingenuity Pathway Analysis (IPA), the expression of miRNA proved as statistically significant, that lead to sum up the biological significance and identification of miRNAs and their related target gene interaction.

**qRT-PCR data validation:** MiR-141 had an expression level in ovarian cancer of 203.1 ± 275 for good sensitivity and specificity. The miR-141 proved as excessive expression in ovarian cancer patients. As compared to the other types of cancer, the level of expression was greater in ovarian cancer. The Fold change of ovarian cancer was 26.19 ± 30.59. In findings, the PCR-array data agreement was significant. The value of 0.84 AUC for ovarian cancer patients was revealed by ROC curves of miR-141.

**Discussion**

The present study revealed that, the miRNAs were responsible for the expression in ovarian cancer vs. normal tissue. They were also responsible to identify the differentially expressed miRNAs in ovarian cancer. The miRNAs were also used for prognostic and diagnostic markers, as well as for predicting ovarian cancers and its severity level. They emphasized the functional differences, used to regulate the incidences of ovarian cancers. The pattern of miRNA expression might differentiate and distributed from the incidences of endometriosis from normal tissue. The detection, analysis of the miRNAs and altered pattern of expression were included in malignant incidences and transformation. By qRT-PCR validated miRNAs, the sensitivity and specificity were noticed. The panels of miRNAs may take into account for potential usage as markers of prognosis and diagnosis. Especially used for ovarian cancers and procedures of surgery (7).

In modulation and favoring proangiogenic mechanism, the ovarian-related miRNA had an important role to play. Therefore, in the selected pathologies, the miRNA can be taken into account as a prognostic as well as a therapeutic target. By angiogenic mechanism, those ovarian-related miRNAs were prone for activation. On ectopic sites, they can affect the implantation of endometrial cells (10).

Davis et al. (3) explained that, there was a high resistance for cisplatin with respect to the expression of miR-141. It was found to be in accordance with positive aberrancy of transcript ‘grade. In ovarian cancer, members of the miR-141 have also been identified. Those transcripts were proposed as biomarkers. The expression was correlated between tissue samples and its values from blood samples.

The cooperation and relationships between ovarian carcinoma remained a controversial issue, but it is sustained by miRNAs. Simultaneously, a particular miRNA signature was identified as capable discrimination between ovarian cancers. The findings lead the ground for further researches for the purpose of miRNAs role in endometriosis and malignancies (12).

The differentially expressed miRNAs-141 might play significant role in regulating functions of pathological processes which sustained cell proliferation. Now it is understandable that miRNAs played an essential part in pathology and can be linked to malignant transition of the ovarian cancer (6).

According to the panel of identified miRNAs, the dysregulated miRNAs discovery can perform as accurate biomarkers for the applications of diagnosis and prognosis. It also assesses the risk factors involved in the changing from benign to malignant (14).

The study demonstrated that differentially expressed miRNAs especially miRNA-141 contributed significantly in regulation of pathological processes that sustain cell proliferation of ovaries. The miRNAs-141 related to regulating the ovarian tumor. During ovarian cancer treatment, they can contribute to malignant transformation with its effect for drug resistance.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Not required

**REFERENCES**


Experience of the Nurses on Family Involvement in the Care of Patients with Acute Coronary Syndrome (ACS) at the Intensive Cardiovascular Care Unit

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ABSTRACT

Background: Family involvement in the Intensive Cardiovascular Care Unit (ICCU) is still controversial as it is a room with a high level of care. The policies of each hospital on this matter vary.

Objective: The purpose of this study is to explore the experience of the nurses on family involvement in the care of patients with Acute Coronary Syndrome (ACS) at the ICCU.

Method: This study is descriptive qualitative research with 24 participants (nurses) who have experience working in ICCU at least 1 year.

Results: This study results in finding of two themes: making a work environment crowded and interfering with the nursing activities.

Conclusions: Therefore, it is necessary to prepare a manual of family involvement procedures in the care of ACS patients in ICCU so as not to interrupt the treatment process.

Keywords: Acute Coronary Syndrome, Caregiver, Intensive Cardiovascular Care Unit, Nursing

Introduction

Acute coronary syndrome (ACS) is an ischemic heart disease and patients are treated in the Intensive Cardiovascular Care Unit (ICCU). Family involvement in ICCU can improve patient safety and satisfaction and is accepted in nursing practice in general.[1] However, family involvement in ICCU is still a controversy of every health service provider because it is a room with high levels of care, rigorous monitoring, and the use of complex medical procedures in the context of the health status of patients, a decrease is often experienced and things can go unpredictable. Based on a literature out of 892 screened articles, 124 article analyses are eligible and the results show 5 components of differences in patient and family involvement including attendance, support, communication, decision makers, and contribution to care.[2] Therefore, it is necessary to have an internationally relevant policy regarding the extent of family involvement in the ICCU in improving service quality in patients.

Patients in critical condition need moral support from the nearest person or family. Families in this context are defined as people who are intimately and routinely close to the patients throughout the process of nursing care. These people experience anxiety because of the entry of patients to critical areas and require support from the surrounding environment.[3] Based on research by family members play important roles in medical care in the Intensive Cardiovascular Care Unit (ICCU) as one of the most important progress units in the treatment of patients with Acute Coronary Syndrome.[4,5] The role

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of the family includes decision makers, intermediary communications between patients and health workers, and they also provide psychological safety for patients. Based on the research, there are 5 components of differences in patient and family involvement including attendance, support, communication, decision makers, and contribution to care. Patients believe the presence of family members will help to lower anxiety levels and increase comfort levels. Research by Neill says that the involvement of family members in critical patients in the intensive care unit can benefit patients and families where families will provide moral support to patients and help nurses provide holistic services with family-centeredness.

However, restrictions on family involvement and policy limiting ICCU visits encourage confidence that visitors can impede medical care and treatment, making patients exhausted, and may interfere with the treatment process or healing. This is consistent with the theory that there is a negative psychological effect on patients due to the presence of visitors as this increases risk of infection, unsafe working environment, and jeopardize the privacy of patients undergoing treatment at the ICCU. Given that patients treated at ICCU are high-risk patients and may experience a sudden change of condition. Critical care activities require specialized care and effective equipment and highly trained nurses, doctors, and other supporters.

The purpose of this study is to explore the experience of nurses on family involvement in the care of ACS patients in the ICCU. The benefits of this study are expected to be an evaluation material for hospital management in determining family involvement policy in the care of ACS patients in ICCU.

**Material and Method**

**Design of Study:** The design of the study is a descriptive qualitative.

**Population and Sample:** Participants in this study were 24 nurses working in the EDs general hospital in East Java Province, Indonesia. Participants were selected from population using purposive sampling approach based on inclusion criteria including having experience working in ED at least 1 year, having experience treating patients with ACS, and have followed Basic Cardiac Life Support and Intensive Care Nursing Training.

**Data Collection:** The study was conducted by a team of researchers led by a research nurse with high integrity and cardiovascular expertise. Prior to the data collection process, participants would get an explanation on the objectives, benefits, and research procedures. There was no relationship between researchers and participants. Researchers held 2 to 3 meetings, this was done as to ensure participants to share their experiences on family involvement in ACS patients in ICCU openly and honestly.

The researchers explored the nurses’ perception of the family involvement of the ACS patients in the ICCU through a semi-structured in-depth interview. The interview process was conducted face-to-face in the ICCU nurses’ room. Participants were interviewed one by one. Interviews lasted from 30-50 minutes per participant. Statements submitted by the participants were recorded into audio (MP3). The research results are kept anonymous and confidential.

**Data Analysis:** Interview data were analyzed manually using thematic methods, where one cannot proceed to the next phase without completing the previous stage. The stages are: a) familiarisation with the data, done by reading repeatedly the results of interviews; b) coding, executed by making categories of words considered important and answering research objectives; c) searching for themes, organizing categories according to their groups for subthemes and themes; d) reviewing themes, checking the suitability of themes and categories; e) defining and naming themes, defining themes for obtaining the main idea of each theme; and f) writing up, writing the results of research as a report after associated with the existing literature.

**Results**

Based on the results of interviews, two themes were identified: a crowded work environment and disruption to the nursing activities.

**A crowded work environment:** This is a condition where there are a lot of visitors causing the room to be full and crowded. This happens due to the non-compliance of visitors to policies or regulations that have been set by the room. This sub-theme has three sub-themes: many visitors, the violation of rules, and non-compliance to visiting time.

Participants state that a large number of visitors are caused by not obeying the rules submitted by nurses.
This usually makes nurses feel disturbed in the process of providing nursing services to patients. Increased number of visitors not only interfere with the activities of nurses but will disturb the comfort of nearby patients.

The question was, “what do you think about the patient’s visit to ICCU?”, and the answers from participants are as follows;

“...the rule seems a bit lost. We have told them that the patient can only have one visitor at a time, well yeah another one follows. As time goes by, there are too many people coming, too many are entering the room, so we have to remind them continuously...” [P3]

Participants state that families often violate the rules in the room although the nurses have repeatedly reminded them about the rules. Family members react differently to rules set in the room.

The question was, “according to your experience, what is the patient’s family attitude about the limitations of visitors in this room?”, and the answers from participants are as follows;

“...sometimes, when the patient is a health worker or the staff of the hospital itself, we find it difficult to remind the visitors that they can only visit the patient one by one, or the main family member, well yeah it is a bit problematic, we find it rather difficult to stick to the rules.” [P4]

“Well, some people just do not listen to what we say, to the rule. People are different. And yes, there are families disobeying the rules, no matter how many times we explain the rules, they keep breaking them.” [P5]

“we sometimes forget that there is one family that makes him feel uncomfortable, maybe because of a conflict or a problem, it’s one of the things that makes the patient uncomfortable, the patient looks calm but thinks his heart is still working hard” [P16]

Participants revealed that the nurses find it difficult to remind the family members to leave as soon as the visiting time is over. To make people obey the visiting time, the nurses often leave it to the security guards.

The question was, “What actions do you take to deal with a family that violates visiting rules?”, and the answers from participants are as follows;

“Yeah, it is rather difficult. After the visiting time is over, they simply do not want to leave the room. We just call the security guard, ask for help to remind the visitors to leave.” [P7]

Disruption to the Nursing Activities: This theme shows that nursing activities cannot be optimally done as there are too many people in the room. There are 2 sub-themes that describe the activities of nurses that cannot run optimally disrupt the actions performed and cause more stressors. Participants revealed that a large number of families can disrupt the actions performed by the nurses so services provided are not maximal and this has an impact on the patients’ healing process.

The question was, “what impact did you feel due to too many patient family visits?”, and the answers from participants are as follows;

“We have many tasks to do, and there are many family members around, we just find hard to perform the actions needed.” [P4]

“more stressors in the ICCU than in the treatment room, here the stressors are sometimes from colleagues, our doctors, patients, and their families” [P24]

Discussion

The results show that many family members present in the ICCU can disrupt the activities of the nurses making them find it hard to perform their duties optimally. Given that the ICCU is a room that requires high maintenance and is accompanied by numerous measures and highly complex medical equipment to support patient care, and that patients treated at ICCU are high-risk patients and may experience a sudden change of condition, this situation must be avoided.

The intensive care unit is a specially designed and fully furnished facility with experts to provide effective and safe care for life-threatening patients or possibly life-threatening health problems. Critical care activities require special care and effective equipment and highly trained nurses, doctors, and supporters. The number of actions and equipment installed in the ICCU accompanied by the visit of family members caused the room to become crowded so the nurses could not provide optimal service. The duty of nurses is not easy because they are dealing with many parties, both patients and their families; thus, their job requires not only skill but also high patience in facing all kinds of situations and conditions.
The environment and situation in the ICU are certainly very different from the usual treatment room. Four informants stated that the family members’ disobedience greatly disturbs the activity. Patience is needed in the communication between the nurses and the patients’ family considering the nurses are directly related to them. Nurse work is not easy because they must be able to control emotion even when the patients’ family members shout at them. Nurses are required to always be professional in any situation and condition including facing complaints from both patients and family members.

The results show that families often violate the visiting time. The disobedience of family members and relatives during the visit results in a negative interaction between the nurses and the family members. The nurses complain that visits made by family members outside the visiting hours interfere with their work, other patients, and threaten patients’ privacy. Thus, it is necessary to limit the involvement of the family and the policy to limit the ICU visit is based on the belief that visitors may hinder the care and medical treatment as well as making patients fatigue which finally may affect the healing process. This is consistent with the theory that there is a negative psychological effect towards patients on the presence of visitors as it increases the risk of infection, leads to an unsafe working environment, and jeopardizes the privacy of patients undergoing treatment at the ICU.

This study, however, contradicts research stating that family members’ involvement in critical patients in the intensive care unit can benefit patients and families where families will provide moral support to patients and assist nurses in providing holistic, family-oriented care. Family members play important roles in the medical care of patients in the ICU. This role includes acting as an alternative caregiver, meeting patients’ wishes, assessing the suffering of patients, as an informant in communicating between patients and physicians, and a source of hope and comfort. Because of the key family role in patient assessment, support, and decision making, providing family-centered care is a key component in providing patient-centered care.

In the research, two important sub-themes have been found that family involvement in the ICU makes the room crowded and interrupted the activities of the nurses. However, the role of the family in involvement in the ICU is needed in the case of decision makers, as an informant in communicating between patients and health personnel, as well as providing moral support to patients. Family involvement must be tailored to the conditions and situations in the ICU room and the patients’ condition so as not to interfere with the activities of the nurses. It is hoped that there will be guidance on family involvement in the ICU and future research is expected to examine the extent to which family members are involved in intensive care to improve optimal services in patients with Acute Coronary syndrome treated at the ICU.

Source of Funding: The researchers would like to thank the Medical Faculty of Brawijaya University who has funded this research.

Conflict of Interest: The authors declare they have no competing interests

Ethics Approval and Consent to Participate: This study has obtained the approval of ethics from Medical Faculty, Brawijaya University, Number 216/EC/KEPK/06/2017.

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The Relationship between Experience and Training with Nurses Knowledge in the Pre-Disaster Phase

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ABSTRACT

Indonesia’s territory is in a condition with a high risk of natural disasters. On average every day five disasters occur in Indonesia. Disaster is a phenomenon that can appear anywhere, anytime, and to anyone with a sudden process of occurrence. Reducing the impact of disasters requires preparation through disaster management activities in the pre-disaster phase. Nurses have a big role in the pre-disaster phase to reduce the risk of health problems caused by disasters. This study aimed to know the relationship between experience and training with nurses’ knowledge in the pre-disaster phase. This study used cross-sectional. The population of this study was nurses in Ngudi Waluyo Hospital Blitar, East Java, Indonesia. 152 respondents were selected using a simple random sampling technique. Data was collected for 2 weeks after using a questionnaire. The collected data of this study were analyzed using Chi-Square (α = 0.05) with SPSS 20 program. There was no significant relationship between experience and knowledge (α = 0.121) but there was a significant relationship between training and knowledge (α = 0.00). Training is very important to ensure the readiness of individuals ready to face disasters

Keywords: experience, training, knowledge, nurses, pre-disaster phase

Introduction

The territory of Indonesia is in a condition with a high risk of natural disasters. The level of disasters in Indonesia is very high, with 1,500-2,000 times per year recorded. There were 1,967 disasters in 2014 and 1,582 disasters in 2015 in Indonesia. On average every day a disaster occurred in Indonesia.1. Disaster is a phenomenon that can appear anywhere, anytime, and to anyone with a sudden occurrence process. It can result in fatalities, environmental damage, property losses and psychological impacts.3. Reducing the impact of disasters requires preparation through disaster management activities in the pre-disaster phase. According activities in pre-disaster are aimed at reducing the impact of preventive disasters, namely the ability to avoid and prevent disasters, and to reduce the impact of disasters4.

Critical facilities including community health centers must be able to protect affected communities and disaster victims, especially when the disaster response phase occurs. The hospital will be the last destination in the process of handling victims so that hospitals are expected to be able to make good preparations. Nurses have a big role in the pre-disaster phase to reduce the risk of health problems caused by disasters. Nurses are expected to have the ability to provide disaster management servants at all stages starting from pre-disaster (mitigation and preparedness), emergency response (response) and post-disaster (rehabilitation) through nursing activities, implementing programs from the government and coordinating with parties related to disaster management. The series of activities carried out by nurses in disasters are in accordance with their role, namely nursing care providers, disaster preparedness educators, coordinators and developers of disaster management programs as well as researchers5.

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Research in Hong Kong with a sample of 164 Register Nurse (RN) explained to support nurses’ abilities in disaster management activities, needed competencies that must be fulfilled by nurses, namely: First aid, Basic Life Support (BCLS), Advanced Cardiovascular Life Support (ACLS), infection control, field triage, pre-hospital trauma life support, advanced trauma care nursing, post-traumatic psychological care, and peri-trauma counseling. Competencies that must be possessed by nurses according to ICN & WHO (2009) are competency as first medical responder, direct care provider, care coordinator, information center and educator, mental health consultant and triage officer. In more detail ICN & WHO divides nurse competencies in disasters into four classifications, namely mitigation competencies (prevention), preparedness competencies (preparedness), response competencies (disaster response) and recovery and rehabilitation competencies.

Current conditions in the field show that nurses’ knowledge about disaster management is still lacking starting from knowledge about disaster preparedness, disaster response and recovery after disasters. This study aimed to know the relationship between experience and training with nurses’ knowledge in the pre-disaster phase.

Method and Material

The method used in this study was cross-sectional design. The research was conducted in February 2019 at Ngudi Waluyo Hospital at Blitar East Java, Indonesia. The population in this study were 152 nurses were selected using simple random sampling technique with inclusion criteria: nurses who are registered as employees of Ngudi Waluyo Hospital at Blitar and willing to be a research respondent.

The research instrument used a knowledge questionnaire of 20 questions. Validity and reliability test of questionnaire were conducted involving 20 respondents with the same characteristics as the research subject. Validity and reliability test are indicated by corrected item-total correlation > r table (0.3809) and Cronbach’s alpha value of 0.901. The data were tested by the Chi-Square test and statistical analysis was carried out using the SPSS 20 program.

Results

Table 1: Characteristics of respondents by age and gender (N:152)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Respondents</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35 age</td>
<td>69</td>
<td></td>
<td>45.4%</td>
</tr>
<tr>
<td>≥35 age</td>
<td>83</td>
<td></td>
<td>54.6%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>59</td>
<td></td>
<td>38.8%</td>
</tr>
<tr>
<td>Female</td>
<td>93</td>
<td></td>
<td>61.2%</td>
</tr>
</tbody>
</table>

Characteristic of respondents by age is presented in table 1. The result shows the majority of respondents (54.6%) were ≥ 35 years old. And Characteristics of respondent by gender is presented in table 1 shows that the majority of respondents (61.2%) were female.

Table 2: Characteristics of respondents by education

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Respondents by education</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td>104</td>
<td></td>
<td>68.4%</td>
</tr>
<tr>
<td>Ners</td>
<td>48</td>
<td></td>
<td>31.6%</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Characteristics of respondent by education is presented in table 2 shows that the majority of respondents (68.4%) were Diploma.

Table 3: Characteristics of respondents by training and experience in disaster

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Respondents by training and experience in disaster</th>
<th>Frequency in Training (n)</th>
<th>Percentage (%)</th>
<th>Frequency in Experience (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>never</td>
<td>107</td>
<td>70.4%</td>
<td>134</td>
<td>88.2%</td>
<td></td>
</tr>
<tr>
<td>ever</td>
<td>45</td>
<td>29.6%</td>
<td>18</td>
<td>11.8%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100</td>
<td>152</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Characteristics of respondent by experience in disaster is presented in table 3 shows that the majority of respondents (70.4%) were never join training about disaster. And Characteristics of respondent by experience in disaster is presented in table 4 shows that the majority of respondents (88.2%) were never have experience in disaster.
Table 4: Characteristics of respondents by knowledge competence in the pre-disaster phase

<table>
<thead>
<tr>
<th>Characteristics Variable</th>
<th>Respondents by knowledge competence in the pre-disaster phase</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>good</td>
<td>63</td>
<td>41.4%</td>
</tr>
<tr>
<td></td>
<td>less</td>
<td>89</td>
<td>58.6%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>152</td>
<td>100</td>
</tr>
</tbody>
</table>

Characteristics of respondent by knowledge competence in the pre-disaster phase is presented in table 4 shows that the majority of respondents (58.6%) less about disaster.

Table 5: The relationship between experience in disasters and knowledge competence in the pre-disaster phase of nurses at Ngudi Waluyo Hospital at Blitar

<table>
<thead>
<tr>
<th>Experience in disasters</th>
<th>Knowledge competence</th>
<th>Total</th>
<th>OR (95% I)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Never</td>
<td>82</td>
<td>61.2%</td>
<td>52</td>
<td>38.8%</td>
</tr>
<tr>
<td>Ever</td>
<td>7</td>
<td>39.9%</td>
<td>11</td>
<td>61.1%</td>
</tr>
</tbody>
</table>

Table 5 shows the relationship between experience in disasters and knowledge competence in the pre-disaster phase of nurses at Ngudi Waluyo Hospital at Blitar. The statistical test results obtained p value = 0.121, it can be concluded that there was no difference in the proportion of knowledge competency in the pre-disaster phase to nurses between respondents who have never been involved in disasters (there was no significant relationship between disaster training and knowledge competency in the pre-disaster phase at nurse).

Table 6: The relationship between training about disasters and knowledge competence in the pre-disaster phase of nurses at Ngudi Waluyo Hospital at Blitar

<table>
<thead>
<tr>
<th>Training about disasters</th>
<th>Knowledge competence</th>
<th>Total</th>
<th>OR (95% I)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Never</td>
<td>80</td>
<td>74.8%</td>
<td>27</td>
<td>25.2%</td>
</tr>
<tr>
<td>Ever</td>
<td>9</td>
<td>20%</td>
<td>36</td>
<td>80%</td>
</tr>
</tbody>
</table>

Table 6 shows the relationship between training about disasters and knowledge competence in the pre-disaster phase of nurses at Ngudi Waluyo Hospital at Blitar. The result of Chi-Square test showed that p = 0.000 (p-value <0.05), it can be concluded that there is a difference in the proportion of knowledge competency in the pre-disaster phase of nurses between respondents never with those who have attended disaster training (there was a significant relationship between disaster training and knowledge competency in the pre-disaster phase of nurses).

Finding

a. The relationship between experience in disasters and knowledge competence in the pre-disaster phase of nurses at Ngudi Waluyo Hospital at Blitar: The results of the statistical test of the relationship between experience variables in disasters and knowledge competencies obtained p = 0.121 (α <0.05) with a value of r = 2.478. So it can be concluded that there was no significant relationship between experience in disasters and knowledge competencies in the pre-disaster phase of nurses at Ngudi Waluyo Wlingi Hospital. In the study that entered the category of good knowledge for respondents who had experience in disasters amounted to 11 respondents (61.1%) out of a total of 18 respondents, while those who did not have experience in disasters amounted to 52 respondents (38.8%) of a total of 134 respondents. Only a small percentage of nurses have been directly involved in disaster activities.
Experience according to Notoadmojo (2012) is included in factors that influence knowledge. Xu & Zeng (2016) mentioned that nurses who have participated in the rescue process in disasters have gained adequate experience and good psychological endurance. Nurses are able to understand the characteristics of activities that must be carried out in the rescue process. So that the relevant knowledge and skills of nurses are able to increase capacity in disaster nursing. Knowledge and skills to increase the capacity of disaster nursing. Li & Zang (2013) stated that the process of rescuing on the ground during a disaster can increase awareness of the importance of improving one’s abilities in rescue activities to increase their awareness and motivation to learn.

Tzeng et al. (2016) revealed that nurses who work in emergency and critical care units have good capture and response in disaster management. This shows that nurses who work in an emergency have response experiences and self-confidence in managing crisis situations such as disaster situations but Martono et al (2018) in the study stated that experience is not significantly related to nurses’ knowledge in disaster management.

b. The relationship between training about disasters and knowledge competence in the pre-disaster phase of nurses at Ngudi Waluyo Hospital at Blitar: The results of the statistical test of the relationship between training and competency variables of knowledge obtained a value of \( p = 0.000 \) (\( \alpha <0.05 \)) with a value of \( r = 11.852 \). So it can be concluded that there was a significant relationship between disaster training with competence (knowledge) in the pre-disaster phase of nurses at Ngudi Waluyo Wingi Hospital. In the study included in the category of good knowledge for respondents who had attended disaster training amounted to 36 respondents (80%) of a total of 45 respondents, while those who had never attended disaster training amounted to 27 respondents (25.2%) out of a total of 107 respondents.

Training part of the education process and receiving information. Notoadmojo (2012) stated that education and information are factors that influence individual knowledge. The results of this study indicate that respondents with their last education S1 Nursing + Nurses have a better level of knowledge compared to respondents whose education is DIII/D4 Nursing. Training is one of the factors that influence knowledge because training is an implementation activity in the field. Training using the case simulation method can stimulate respondents to think critically and creatively so they can increase knowledge. The results of this study are comparable to Xu & Zeng (2016) that disaster training influences the competence of nurses in China about disaster preparedness. Alim et al. (2014) stated in the study that training and disaster simulation can improve nurses’ knowledge and abilities in disaster management.

Ahayalimudin & Osman (2016) from the results of his study revealed that training is very important to ensure the readiness of individuals ready to face disasters because there was a significant relationship between the presence of education/training participants and practices related to disaster management. Individuals who have attended disaster education or training and are directly involved in disaster response have good self-confidence and increased self-awareness regarding the importance of disaster management. Training creates readiness to manage the impact of disasters. It requires training facilities and provision of opportunities by health care authorities to enable emergency care and medical personnel to participate fully in training.

**Conclusion**

There was no relationship between experience in disasters and knowledge competencies and there is a relationship between disaster training and knowledge competencies. This finding proves that the training is one of the factors that can affect individual knowledge because training is an activity in the form of direct implementation in the field. It is recommended to do further research to investigate the knowledge, attitude and practice retention for nurses at hospital. Organizing training activities on training management can have a good influence on the level of knowledge for nurses. Nursing education institutions and related agencies responsible for disaster events so that they can organize disaster training activities for nurses in hospitals.
Conflict of Interest: None

Ethical Clearance: This study has passed the ethical test held at Faculty of Medicine Universitas Brawijaya with number 37/EC/KEPK-S2/02/2019.

Source of Funding: None

REFERENCES


3. Undang-Undang No. 24 Tahun 2007 about Disaster Management


Outpatients’ Attendants Knowledge Regarding Antibiotics Use and Antibiotics Resistance in Al- Najaf Al-Ashraf City Health Institutions

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ABSTRACT

Antibiotics are important drugs that affect bacteria either kill or stop the growth of bacteria; appearance of the so called antibiotics resistance threatens its effectiveness on the therapeutic level. The level of knowledge regarding the antibiotics use and resistance of people provides them adequate protection against the risk of resistance whenever the assessment is good. The importance of the subject in Iraq invited us to choose this subject, which affects the lives of the human. This study focuses on assessing outpatients’ knowledge regarding antibiotics use and antibiotics resistance and the effect of some demographic variables and source of information on their knowledge. A descriptive design, survey study was carried out in al-Najaf City hospitals for the period from September 24th, 2018 to May 1st, 2019, nonprobability sampling technique convenience sample of 451 respondents. Questionnaire consists of socio-demographic information, and 34 questions for the knowledge of use, and resistance. The overall knowledge of outpatients’ knowledge was fair and affected by age, gender, educational level, occupational status, and residency of participants.

Keywords: outpatients’ attendants, knowledge, antibiotics use, antibiotics resistance.

Introduction

The entire world, antibiotics cannot be dispensed within the field of medicine and this is considered an evolutionary revolution. In medicine, especially in modern medicine, the treatment of bacterial infections is the basis of all other treatments, especially in surgery, internal medicine, chemotherapy, and others. Antibiotics used by most people without knowing the magnitude of the risk behind this use and the global public health problem. Appropriate and scientifically required antibiotics use, according to the known pharmacological policies of antibiotics which ensure better health and low costs for public health. Antibiotics resistance is most important global public health problems, which indicate that antibiotics are not affected by bacteria for several reasons, are the most important of which misuse, inappropriate use, and taking over-the-counter antibiotics. The challenges that affect the treatment of infections are the obvious causes of bacterial resistance to antibiotics, which in turn lead to the length of stay in the hospital (prolong stay), and the high rate of morbidity and mortality and also increase in cost to the individual, family, and community and also affect in one way or another Public Health System of the State.

Objectives of the Study:

1. To assess Outpatients level of knowledge concerning Antibiotics use and antibiotics resistance.

2. To find out the relationship between outpatients level of knowledge regarding antibiotics use and resistance and certain variables; age, gender, residency, marital status, monthly income, educational level, and sources of previous information, access the antibiotics, number of medical visits, and safely use of antibiotics.

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Method

A descriptive design, survey study was carried out, to attain the stated objectives, during the period from September 24th, 2018 to May 1st, 2019. The study was conducted in the Najaf Health Directorate in four main hospitals in Al-Najaf AL-Ashraf City, Iraq.

Instrument of the Study: Questionnaire by interview, after reviewing literature related to antibiotics use and resistance. Used modified on an original instrument which that constructed previously (6) (7). The slight modification according to supervisor and expert’s direction to suit the study population. The questionnaire consists of first part, which deals with sociodemographic data, and second part, information about antibiotic. The third and fourth part deals with questions about knowledge consist of 34 questions.

The Statistical Analysis: The data of the (451) participants were entered and analyzed by means of the statistical package for social sciences (SPSS), V.23, 2015.

Findings

The total number of the studied group was 451 patients with a mean age of (32.7 ± 8.5) years range (20 - 65 years). About two-thirds, (63.4%), of them were married, more than one-third,(36.4%), of the participants had primary level of education. As for the occupation status, housewives represented (41.5%). Regarding the economic status, (53.4%), claimed it is sufficient to some extent. The distribution of the sources through which the participants got their knowledge, more than two-thirds participants (68.7%) got their knowledge from their friends, however, some patients showed overlapping in their source of information and got more than one source. The main source of antibiotics that the participants got was Pharmacies which was reported as a source by (69.2%) of participants, and other sources contributed in different rates. Majority of the study participants,(76.5%), claimed that they had number of medical visits during the year on need. When the participants asked about the easiest mode of administration of antibiotics, (41.9%) reported intravenous injection, intramuscular injection (IM) reported by (40.6%), while only (17.5%) said that oral mode of administration was the easiest way to take antibiotics,(Table 1)

The respondents’ assessment about antibiotic use and antibiotic resistance and overall means score revealed a fair overall knowledge, with a mean score of 1.71, (Table 2). Further distribution of the study participants according to their level of knowledge revealed that only (4.2%) had good knowledge, (31.5%) fair knowledge and (64.3%) had poor knowledge (Figure 1).

Table 1: Distribution of the information about antibiotics (N = 451)

<table>
<thead>
<tr>
<th>Source</th>
<th>Rating</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about antibiotics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television</td>
<td></td>
<td>39</td>
<td>8.6</td>
</tr>
<tr>
<td>Network</td>
<td></td>
<td>32</td>
<td>7.1</td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td>310</td>
<td>68.7</td>
</tr>
<tr>
<td>Nurses</td>
<td></td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td>Doctors</td>
<td></td>
<td>10</td>
<td>2.2</td>
</tr>
<tr>
<td>Pharmacists</td>
<td></td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Family</td>
<td></td>
<td>53</td>
<td>11.8</td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
<td>60</td>
<td>13.3</td>
</tr>
<tr>
<td>Pharmacy</td>
<td></td>
<td>312</td>
<td>69.2</td>
</tr>
<tr>
<td>Family</td>
<td></td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Doctor Clinic</td>
<td></td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Nursing Clinic</td>
<td></td>
<td>71</td>
<td>15.7</td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Personal opinion</td>
<td></td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Source of antibiotics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
<td>60</td>
<td>13.3</td>
</tr>
<tr>
<td>Pharmacy</td>
<td></td>
<td>312</td>
<td>69.2</td>
</tr>
<tr>
<td>Family</td>
<td></td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Doctor Clinic</td>
<td></td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Nursing Clinic</td>
<td></td>
<td>71</td>
<td>15.7</td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Personal opinion</td>
<td></td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Number of medical visits during the year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a month</td>
<td></td>
<td>8</td>
<td>1.8</td>
</tr>
<tr>
<td>Once a year</td>
<td></td>
<td>64</td>
<td>14.2</td>
</tr>
<tr>
<td>On need</td>
<td></td>
<td>345</td>
<td>76.5</td>
</tr>
<tr>
<td>I did not visit</td>
<td></td>
<td>34</td>
<td>7.5</td>
</tr>
<tr>
<td>The easiest way to take of antibiotics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td>79</td>
<td>17.5</td>
</tr>
<tr>
<td>IM injection</td>
<td></td>
<td>183</td>
<td>40.6</td>
</tr>
<tr>
<td>IV injection</td>
<td></td>
<td>189</td>
<td>41.9</td>
</tr>
</tbody>
</table>

Table 3: Summary of the mean scores of the study participants for antibiotic use and antibiotic resistance and overall mean score

<table>
<thead>
<tr>
<th>Domain</th>
<th>Mean of Score</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge about antibiotics use (24 items)</td>
<td>1.66</td>
<td>Poor</td>
</tr>
<tr>
<td>Knowledge about antibiotics resistance (10 items)</td>
<td>1.84</td>
<td>Fair</td>
</tr>
<tr>
<td>Overall knowledge for all items (34 items)</td>
<td>1.71</td>
<td>Fair</td>
</tr>
</tbody>
</table>

Good: (mean of score 2.34 - 3), Fair: (mean of score 1.67-2.33), Poor: (mean of score 1-1.66), cut off point (0.66).
The cross-tabulation for the relationship between overall knowledge about antibiotics use and resistance of the study participants and demographic variables that revealed a statistically significant association with age, gender, residence, education level, and occupation status (P< 0.05), while marital status and economic status were insignificantly associated with the level of knowledge (P>0.05). The study indicated that the level of knowledge, (Table 3)

Table 3: Cross-tabulation for the relationship between overall knowledge and demographic variables (N = 451)

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Rating</th>
<th>Overall knowledge</th>
<th>P- value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Poor</td>
<td>Fair</td>
</tr>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 - 24</td>
<td></td>
<td>33</td>
<td>18</td>
</tr>
<tr>
<td>25 - 29</td>
<td></td>
<td>66</td>
<td>79</td>
</tr>
<tr>
<td>30 - 34</td>
<td></td>
<td>62</td>
<td>20</td>
</tr>
<tr>
<td>35 - 39</td>
<td></td>
<td>59</td>
<td>27</td>
</tr>
<tr>
<td>≥ 40</td>
<td></td>
<td>40</td>
<td>29</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>134</td>
<td>111</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>126</td>
<td>62</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>150</td>
<td>113</td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td>110</td>
<td>60</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>92</td>
<td>59</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td>166</td>
<td>108</td>
</tr>
<tr>
<td>Widowed/ separated</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>divorced</td>
<td></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td></td>
<td>45</td>
<td>24</td>
</tr>
<tr>
<td>Read &amp; write</td>
<td></td>
<td>38</td>
<td>32</td>
</tr>
<tr>
<td>Primary</td>
<td></td>
<td>85</td>
<td>74</td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td>64</td>
<td>17</td>
</tr>
<tr>
<td>Preparatory</td>
<td></td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Diploma</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Bachelor or higher</td>
<td></td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Postgraduate</td>
<td></td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Occupation status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employee</td>
<td></td>
<td>45</td>
<td>26</td>
</tr>
<tr>
<td>free business</td>
<td></td>
<td>83</td>
<td>40</td>
</tr>
<tr>
<td>housewife</td>
<td></td>
<td>122</td>
<td>56</td>
</tr>
<tr>
<td>student</td>
<td></td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>leisurely</td>
<td></td>
<td>8</td>
<td>39</td>
</tr>
<tr>
<td>Economic status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td></td>
<td>37</td>
<td>24</td>
</tr>
<tr>
<td>Insufficient</td>
<td></td>
<td>91</td>
<td>53</td>
</tr>
<tr>
<td>Sufficient to some extent</td>
<td></td>
<td>132</td>
<td>96</td>
</tr>
</tbody>
</table>
The analysis using cross-tabulation for the relationship between overall knowledge about antibiotics use and resistance and sources of information about antibiotics revealed a statistically significant association with source of information (P < 0.05). Patients who get their information from their friends had the lower knowledge score and majority of them had poor knowledge. More than one-third of the participants buy antibiotics from private pharmacies (34.4%) they had fair knowledge. About half of the participants visit the hospital or outpatient clinics when needed (49.2%) had poor knowledge. More than a quarter of respondents say that the easiest way to take antibiotics is IV injection (28.6%) are also poor class, (Table 4)

**Table 4: Cross-tabulation for the relationship between overall knowledge sources of information and obtained antibiotics, (N = 451)**

<table>
<thead>
<tr>
<th>Sources</th>
<th>Rating</th>
<th>overall knowledge</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Poor</td>
<td>Fair</td>
</tr>
<tr>
<td><strong>Source of information about antibiotics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television</td>
<td>35</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Net Work</td>
<td>0</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>friends</td>
<td>186</td>
<td>122</td>
<td>2</td>
</tr>
<tr>
<td>Nurses</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Doctors</td>
<td>0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Family</td>
<td>38</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td><strong>Sources of access to the antibiotics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>40</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>147</td>
<td>155</td>
<td>10</td>
</tr>
<tr>
<td>Family</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Doctor Clinic</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nursing Clinic</td>
<td>70</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Friends</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Personal opinion</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Number of medical visit during the year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once a month</td>
<td>0</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Once a year</td>
<td>6</td>
<td>52</td>
<td>6</td>
</tr>
<tr>
<td>On need</td>
<td>222</td>
<td>113</td>
<td>10</td>
</tr>
<tr>
<td>I did not visit</td>
<td>32</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>The easiest way to take of antibiotics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>27</td>
<td>36</td>
<td>16</td>
</tr>
<tr>
<td>IM injection</td>
<td>104</td>
<td>58</td>
<td>1</td>
</tr>
<tr>
<td>IV injection</td>
<td>129</td>
<td>79</td>
<td>1</td>
</tr>
</tbody>
</table>

**Discussion**

Total questionnaires 470 respondents, 19 were excluded the total number of participants was 451. Samples were collected from January 6th, 2019 to March 21th, 2019.

The current study indicated that about a quarter of respondents at an average age of (27 years). This age may be more susceptibility due to a lot of work responsibility, this result similar to the study conducted by Mouhieddine et al. 2015.

Regarding gender, the current study indicates that males are more than females at 55.9%, which is different with most previous studies. Previous studies indicate that the percentage of females is higher than that of males. In residence, the current study indicates that urban participants 59.9% more than rural, this in our study is normal because of the sample taken from hospitals that are in the center of the city. A study conducted by Jifar and Ayele, 2018 is consistent with the current study.
Marital status in this study, about two-thirds of the respondents was married (63.4%). This result is normal in our study matched with age previously and this age is acceptable in our society for marriage. This result stated by another study that marrieds are the highest category of respondents.

Educational level of the participants in the current study, the educational level of respondents was more than one-third at the primary level (36.4%). The previous studies opposite of the current study can be interpreted by the social and economic conditions that surround led to a large segment of Iraqi society not complete study.

Occupational status of the participants, housewives being more than one-third (41.5%) may be the majority of female participants in the current study do not have an occupation because the time the sample was part of the official working most of the staff of the males and females was in their jobs. Previous studies differ from the current study by the occupational status, where the majority of respondents in the previous studies are from the employee class.

Economic status, the description in the current study that more than half of respondents said sufficient to some extent (53.4%) taking into consideration most of the Iraqi people are middle-class economic. A study conducted by You et al., 2008 supports the current study.

Results in the current study showed that the total assessment of knowledge related to the use of antibiotics poor and the mean of score (1.66). And Results in the current study showed that the total assessment of knowledge related to the resistance of antibiotics fair with mean of score (1.84).

Our results showed that the total assessment of knowledge related to the antibiotics use and resistance was fair with mean of score (1.71), Can be explained by a lack of health awareness about antibiotics and the seriousness of resistance to antibiotics as it is not included in the school curriculum. Our findings showed that there is a high significant between the overall level of knowledge about antibiotic use and resistance of age, educational level, occupational status, gender, and residency (P > 0.01).

Current results indicate that there is a high statistical significance between overall the level of knowledge about antibiotics use and resistance and sources of information about antibiotic (p>0.01).

Conclusion

The majority of outpatients who visit hospitals were male with age range 25-29 years. The participants’ overall knowledge of the antibiotics use and resistance was fair. This can be explained by the frequent visits to hospitals as well as the question between peers, which indicates that the study community has knowledge but there is a gap in application. The socio-demographic characteristics have a high statistical significance with the knowledge regarding antibiotics use and resistance except for the economic status. Maybe because of homogeneity the sufficiency to some extent is mostly on the sample and for this reason, it does not create a difference of about the same economic level almost.

Ethical Clearance: All ethical issues related to this research was approved from the local committee of the ethical issues of researches. Informed consents were obtained from all participants. Data were collected in accordance with World Medical Association (WMA) declaration of Helsinki 2013

Conflict of Interest: Authors declared none

Source of Funding: Self-funded by authors

REFERENCES


The Prevalence of Serum and Seminal Fluid Antisperm Antibody in Couples with Unexplained Subfertility in Kirkuk City

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¹Department of Obstetrics and Gynecology, ²Department of Biochemistry, College of Medicine, University of Kirkuk, Kirkuk, Iraq

ABSTRACT

Unexplained infertility occurs in many couples of reproductive ages; immune mechanisms have been postulated in this disorder for the last few decades. Antisperm Antibody (ASA) present in serum and seminal plasma has been implicated. Many researches have been devoted to studying autoantibody in males. However, too little attention has been paid in females. For this aim, 127 couples with unexplained infertility are involved in this case-control study. Enzyme-linked immuno-sorbent assay (ELISA) test is used to detect ASA in serum specimens of both male and female. The same technology is also applied for detecting ASAs in male seminal fluid qualitatively. The results demonstrate that 22.8% of infertile women with unexplained subfertility have IgG-ASA in their serum an. Furthermore, seminal fluid analysis is carried to their partner. Consequently, the results show that out of 127 male patients with unexplained infertility 56 male (44%) and 18 (14.1%) have positive ASA in the seminal fluid and their serum, respectively. Additionally, four couples have positive ASA in the blood of both partners, and two had positive ASA in the blood of the female partner and in the blood and semen of the male partner. Statistically, the outcomes demonstrate that the presence of ASA in the female is not associated with its positivity in the male partner seminal fluid or blood (P>0.05). Accordingly, the study concludes that other causes rather than autoimmune mechanism are more likely implicated in unexplained subfertility.

Keywords: Antisperm Antibody, infertility, serum specimens.

Introduction

Infertility is a worldwide couples issue arises at reproductive age, and it can be likely occurred in one out of five couples ¹. It is defined by World Health Organisation (WHO) as a concern of the reproductive system happens by the failure to get a clinical pregnancy after one year (or more) of regular unprotected sexual intercourse ². The most important cause of subfertility (especially in ageing patients) is bad quality of oocytes. It is important mentioning that it is hard to identify the quality of oocytes ³. Furthermore, in infertile couples, Immunological factors in the form of ASA are deemed as infertility cause in a considerable ratio ⁴,⁵.

The presence of ASA is firstly documented by Samuel Meaker in 1922 ⁶. More specifically, ASA is immunoglobulins of IgA, IgM and or IgG which are pointed the antigens od sperm. Additionally, it can be identified in cervical mucus, ejaculate, follicular fluid, and the serum of male and female partner or both of them ⁷. Furthermore, these antibodies can also occur in 4 % (1 to 2.5%) of fertile females (males). However, the occurrence of ASA in the fertile persons infers that not all ASA leads infertility ⁸. The risk factors of ASAs development in men consist of the breakdown of the trauma and surgery, blood-testis barrier and orchitis ⁹. Additionally, transtubal passage of sperms to the peritoneal cavity (which occurred after vaginal intercourse) may produce ASA formation through presentation and macrophage phagocytosis ¹⁰.

In the literature, ASAs act by capacitation, fertilisation, blocking sperm movement and prevention of implantation of embryos ¹¹. Furthermore, it has been proven that the development of ASAs is not affected by sexual practices ¹². Acrosin antibodies occur in the infertile female sera prevent sperm-zona pellucida binding through the activity of protease ¹³.

Aim: our aim is to find a correlation between unexplained subfertility and autoantibody in partners (for both female and male) with unexplained subfertility.
Patients and Method

A cross-sectional study carried out at the infertility centre at the Azadi teaching hospital in Kirkuk, Iraq during October 2016 - February 2018. Five hundred and thirty-one couples who attended the unit for primary or secondary infertility are included in this study and considered as Initial Study Population (ISP).

The female age of the ISP range from 19-4 year, while the male partners were from 19-60 years, a complete questioner form prepared for each person and included: name, age, date of marriage, occupation and both medical and surgical history. We applied previously set up strict criteria to define an infertile couple as have Unexplained Infertility. The couple who had no identifiable cause of infertility as proved by normal male seminal fluid analysis results and the female partner showed normal ovulation and patent bilateral tubes and uterus as confirmed by hormonal studies and ultrasound and hysterosalpingogram. In 2010, seminal fluid analysis and reporting were done for each male according to the WHO laboratory. Lastly, we excluded from this work those who did not match the above-mentioned criteria.

By applying our strict criteria, 127 patients met them and were our Final Study Population (FSP). ASA was assessed in the sera of both partners of the FSP using ELISA technology (Enzyme-Linked Immunosorbent Assay using Biotek® Machine) used for detection ASAs of the IgG type in the serum of both males and females. The same technology was applied for detection ASAs in male seminal fluid qualitatively.

Statistical analysis was done by SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. We used Chi-Square to study the correlation between the presence of ASA in male and female in different biological fluids. Finally, A P value of less than 0.05 was considered statistically significant.

Results

Our initial study population was composed of 531 couples who attended the fertility unit at Azdi teaching hospital in Kirkuk, Iraq, during the period October 2016 until February 2018. The females were 19-45 year while the males’ partner had a wider age range extending from 19-60 years (Table 1). Only 127 (23.9%) couples of the initial study population met the inclusion criteria and were eligible to be entitled as Final study population.

The remaining couples 404 had various pathologies either in the male 73 (18%) or female partners 149 (36.8%) or in both of them 182 (45%) as clarified in details in Table 2. Oligospermia was the most frequent cause of male infertility Figure 1. The spectrum of female pathologies was wide, and Polycystic Ovarian Syndrome (PCOS) was on the top of the list 81 (54%). An example of the ultrasonic features of PCOS is shown in Figure 2. Tubal pathologies came second 23 (15%), and hysterosalpingography (HSG) was our tool to identify them as shown in Figure 3.

Table 1: The ISP demographics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male</th>
<th>Female</th>
<th>Both male and female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age range</td>
<td>19-60</td>
<td>19-45</td>
<td>-</td>
</tr>
<tr>
<td>Initial study population</td>
<td>531</td>
<td>531</td>
<td>-</td>
</tr>
<tr>
<td>Explained fertility</td>
<td>73</td>
<td>149</td>
<td>182</td>
</tr>
<tr>
<td>Unexplained</td>
<td>127</td>
<td>127</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2: Pathological causes of infertility in female, male and both of them

<table>
<thead>
<tr>
<th>Gender</th>
<th>Pathology</th>
<th>Number of females</th>
<th>% of female causes</th>
<th>% of the total explained causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Femel149(36.8%)</td>
<td>PCOS</td>
<td>81</td>
<td>54%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Tubal</td>
<td>23</td>
<td>15.4%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Endometriosis</td>
<td>13</td>
<td>8.7%</td>
<td>3.2%</td>
</tr>
<tr>
<td></td>
<td>Congenital Uterine</td>
<td>7</td>
<td>4%</td>
<td>1.7%</td>
</tr>
<tr>
<td></td>
<td>Premature ovarian failure</td>
<td>9</td>
<td>6%</td>
<td>2.2%</td>
</tr>
<tr>
<td></td>
<td>Hypothyroid</td>
<td>5</td>
<td>3%</td>
<td>1.2%</td>
</tr>
<tr>
<td></td>
<td>Hyperprolactinaemia</td>
<td>11</td>
<td>7%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

Figure 1: (A) Normal seminal fluid analysis, (B) Abnormal seminal fluid analysis sever oligospermia
Conted…

<table>
<thead>
<tr>
<th>Gender</th>
<th>Oligospermia</th>
<th>Asthenozospermia</th>
<th>Teratozoospermia</th>
<th>Mixed of above</th>
<th>Azoospermia</th>
<th>Both male and female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male 73(18%)</td>
<td>27</td>
<td>23</td>
<td>7</td>
<td>6</td>
<td>10</td>
<td>182</td>
</tr>
<tr>
<td>Ovulatory and seminal fluid</td>
<td>119</td>
<td>46</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tubal and seminal fluid</td>
<td>66</td>
<td>32</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovulatory, tubal and seminal fluid</td>
<td>53</td>
<td>28</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As mentioned previously, our goal is to assess the role of immunology in unexplained infertility, of those 127 couples who were assigned as having unexplained infertility. The majority 98 (77.1%) of the female patients had negative ASA, while the remaining 29 (22.8%) of them had positive ASA in their blood as listed in Table 3.

As outlined in Table 4, 20 patients (68%) their age was more than 35, while distribution of male age among infertile couple, 8 (14.2%) patients their age were below 25 years. Additionally, 9 patients (16%) their age were between 25-34 years. Furthermore, 17 patients (30%) their age was 35-39 years, 14 patients (25%) their age was 40-45, and 8 patients (14.2%) their age was ≥ 45 years.

Table 3: ASA in both males and females with unexplained subfertility

<table>
<thead>
<tr>
<th>Gender</th>
<th>Blood ASA positive</th>
<th>Blood ASA negative</th>
<th>Semen ASA positive</th>
<th>Semen ASA negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18 (14.1%)</td>
<td>109 (85.8%)</td>
<td>56 (44%)</td>
<td>71 (55.9%)</td>
</tr>
<tr>
<td>Female</td>
<td>29 (22.8%)</td>
<td>98 (77.1%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male and female</td>
<td>6 (4.7%)</td>
<td>116 (91.3%)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4: Age distribution of patients with positive ASA.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male ASA positive blood</th>
<th>Male ASA positive semen</th>
<th>Female ASA positive blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>8 (14.2%)</td>
<td>3 (10.3%)</td>
<td></td>
</tr>
<tr>
<td>25-34</td>
<td>6 (33.3%)</td>
<td>9 (16%)</td>
<td>6 (20.6%)</td>
</tr>
<tr>
<td>35-39</td>
<td>3 (16.6%)</td>
<td>17 (30%)</td>
<td>18 (62%)</td>
</tr>
<tr>
<td>40-45</td>
<td>7 (38.8%)</td>
<td>14 (25%)</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>46-60</td>
<td>2 (11.1%)</td>
<td>8 (14.2%)</td>
<td>-</td>
</tr>
</tbody>
</table>

Discussion

The WHO has classified infertility as a global problem and distressing issue to both partners and their relatives. Yet, no conclusive results have been reached with regard to the prevalence of the angiosperms antibody and to what extent their presence jeopardises the fertility capacity. Most of the couples (>70%) who have sought consultation...
for the infertility problem were investigated for infertility and were found to have a pathological cause(s). This is a nearly consistent finding in all other studies despite geographical and demographic variations. PCOS is the main culprit in female infertility. This finding is not surprising that the high prevalence of this pathology at reproductive age group.

The percentage of unexplained infertility among infertile couples was about 23%, and this agrees well with other studies that found the incidence of unexplained infertility is in a range from 5-20% . It is well known that ASA can impair the fertility capacity of couples through different mechanisms such as damaging sperms transport. Additionally, it inhibits sperm penetration of the cervical mucus. This means more they jeopardise capacitation and acrosomal reaction.

It has been suggested that ASA may form in women because of a decrease of one or more immunosuppressive factors in her husband’s seminal fluid as sperm cells may possess protective mechanisms that inhibit immune reactions. However, there is no convincing evidence to aid this hypothesis. Additionally, the mechanism of ASA development in male still not very clear as some ASA are attached to the sperms or circulating in the serum. Therefore, the epididymis is likely to be the critical site of antibody generation, especially in the setting of obstruction. In the literature, several studies have found lower prevalence which reflects a trend toward an association between demographic factors and ASA formation. This might be explained on the bases that older age means more marital sexual exposure and possibility of more damage to the male sexual organs due to physical trauma or other types of damage such as caused by varicocele. Despite all the researchers that have been investigated on the relation between infertility and ASA presence, it is not clear that why some people with positive ASA are still fertile and had no consequence to these antibodies.

**Conclusion**

In this study, we studied the correlation between unexplained subfertility and autoantibody in partners (for both female and male) with unexplained subfertility. 127 couples with unexplained infertility are involved in this case-control study. The results showed that out of 127 male patients with unexplained infertility 56 male (44%) and 18 (14.1%) have positive ASA in the seminal fluid and their serum, respectively. Statistically, the outcomes demonstrated that the presence of ASA in the female is not associated with its positivity in the male partner seminal fluid or blood (P<0.05). Accordingly, we concluded that other causes rather than autoimmune mechanism are more likely implicated in unexplained subfertility.

Nevertheless, we admit that our study has some limitation such as not including fertile couple to see the prevalence of ASA. In addition, the study would have more informative if we treated those patients with immunosuppressive therapy and observed if a reduction in the concentration of the ASA would have resumed the fertility capacity of the couple. Thus we leave these questions for future work.

**Conflict of Interest:** The authors have no financial, consultative, institutional, and other relationships that might lead to bias or conflict of interest.

**Source of Funding:** The authors have no sources of funding, so it is self-funding research.

**Ethical Approve:** We declare that the study does not need ethical approval.

**Ethical Clearance:** This study was conducted with approval from the research ethics committee at the Department of Obstetrics and Gynecology, College of Medicine, Kirkuk University, Kirkuk, Iraq.

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Description of Transformational Leadership of Head Room in the Provincial Hospital in Pariaman Padang Indonesia in 2018

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ABSTRACT

Data obtained from a hospital nurse turnover figures for the year 2017 by 4%. Turnover figures showed that the rate of retention of nurses in HOSPITALS Pariaman is quite high. Results of a study with nurses implementing obtained that level of involvement working nurses in HOSPITALS Pariaman is quite high, but the dimensions of work involvement includes vigor, dedication, and absorption showed different results. This research aims to look at the relationship with the head of the transformational leadership involvement of nurses in HOSPITALS work Pariaman Year 2018. This research is descriptive research analytical, cross sectional design. The sample numbered 105 nurses, taken using a purposive sampling technique. The chi square test results obtained there is transformational leadership relations head with the involvement of the nurse working with the implementing p-value = 0.000 with the OR = 8.735. The hospital is expected to sustain the transformational leadership style of head room and recommends implementing the nurse to continue her career so that further enhance the competencies and career nurse.

Keywords: Transformational Leadership Nursing, Involvement, Leadership.

INTRODUCTION

Marquis and Huston (2010) mention five management functions, namely planning (planning), organizing (organizing), workforce (staffing), direction (actuating), and control (controlling) (1). The fifth function is known as a management process. Some of the literature discusses workforce function (staffing) in more detail in the concept of human resource management (HR). Human resource management is the efficient use of human resources in the Organization through management functions (2). In human resource management (Human Relationship) has developed the concept of engagement work (work engagement) (3).

Work engagement is defined as a positive process of intrinsic motivation (4)and a satisfactory working condition related thoughts that are distinguished by three dimensions, namely strength (vigor), dedication ( dedication), and absorption (absorption) (4). Employees with involvement of interns were able to feel the pleasure, excitement, enthusiasm, physical and psychological health, improve performance, and being able to move their involvement to others (5). According to Mercure, Demerouti, Schreurs, Schaufeli & Bakker (2009), conceptualized as a State work involvement affective-motivational-related jobs that are characterized by strength, dedication and absorption. They define the dedication as the strong commitment and a sense of significance (sense of significance), enthusiastic, inspiration, pride, and challenges in the work. This study explores the work engagement among nurses (4).

In Taiwan, Wu (2010) studied the perceptions of nurses related engagement work. Wu found that nurses who have a work engagement feel happier and find the meaning of life through the process of patient care (6). Therefore it is necessary to grasp the dimensions of the sustainability of developing employees in the workplace. The results of the study showed that employees who develop shows better performance, where 32% of employees demonstrate high organizational commitment and 46% reported job satisfaction. In contrast, employees who did not develop tend to exhibit such negative psychological Burnout (burnout) and fatigue work (7).

Work involvement is a positive State of mind related work that includes the dimensions of spirit (vigour), dedication (dedication), and absorption (absorption) (4). Leadership is a key element in the operational organizations to perform management functions (8). Leadership is the process of influencing another person...
or a group to achieve a common goal (8). The role of leadership of head room as the Manager at the front lines is very important. Leadership places emphasis on increasing productivity by maximizing the effectiveness of work (1). Leadership is important in the nursing work environment as it has effect on the climate and work environment of the Organization (8).

Related research leadership is continuously performed for their ability to induce the employee to have motivation and engagement work (9). At this time the organization requires managers and leaders who are able to develop the level of commitment and enthusiasm of employees associated with the job showing the behavior and characteristics of such a charismatic personality, ability to affect others and had a vision of the future that will bring all resources to achieve the objectives of the organization. The leader is called transformational leaders (10). Transformational leaders are able to encourage employees to enhance the value of the Organization include higher productivity, service quality and solve social problems (11).

MATERIAL AND METHOD

This type of research is descriptive analytic method used is the approach of cross sectional. This research was conducted at the PROVINCIAL HOSPITAL of the city of Pariaman, West Sumatra. The sample in this research totalled 105 people nurse, taken using a purposive sampling technique with inclusion criteria: (1) implementing the PROVINCIAL HOSPITAL nurses all over the Pariaman, (2) implementing the Nurse not being off work and learning tasks, (3) managing Nurses who have served at least 12 months or not within its orientation, because the nurses have been able to identify the model of leadership of head room after interact within 1 year, (4) are willing to be the respondent.

RESULTS

Table 1: Distribution Characteristics of nurses Implementing based on Age, marital Status, and the Long work at the PROVINCIAL HOSPITAL in Pariaman April 2018 (n = 105)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Distribution Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥30 years</td>
<td></td>
<td>56</td>
<td>53.3</td>
</tr>
<tr>
<td>&lt;30 years</td>
<td></td>
<td>49</td>
<td>46.7</td>
</tr>
</tbody>
</table>

On table 1 demographic data obtained illustrate that nurses HOSPITALS implementing Pariaman more half aged ≥ 30 years (53.3%), more than half are married (60%) and more than half of nurses work long executor < 5 years (52.4%).

Table 2: Transformational leadership of Head room in the PROVINCIAL HOSPITAL Pariaman April 2018 (n = 105)

<table>
<thead>
<tr>
<th>Independent Variabel</th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformational leadership</td>
<td>62</td>
<td>59</td>
<td>43</td>
<td>41</td>
</tr>
<tr>
<td>The influence of idealism</td>
<td>61</td>
<td>58.1</td>
<td>44</td>
<td>41.9</td>
</tr>
<tr>
<td>Inspirational motivation</td>
<td>56</td>
<td>53.3</td>
<td>49</td>
<td>46.7</td>
</tr>
<tr>
<td>Intellectual stimulation</td>
<td>60</td>
<td>57.1</td>
<td>45</td>
<td>42.9</td>
</tr>
<tr>
<td>Consideration of the individual</td>
<td>53</td>
<td>50.5</td>
<td>52</td>
<td>49.5</td>
</tr>
</tbody>
</table>

In table 2 illustrates the transformational leadership comprises four subvariable that is the dimension of the influence of idealism, inspirational motivation, intellectual stimulation and individual consideration. Based on the table can be known that more than half of nurses implementing transformational leadership said the head of the room good (59%), more than half the dimension of the influence of idealism (58.1%), more than half the dimension of the inspirational motivation good (53.3%), more than half the dimension of intellectual stimulation (57.1%) and more dimensional considerations individual good (50.5%) HOSPITALS in Pariaman.

DISCUSSION

Based on table 1, obtained by implementing the PROVINCIAL HOSPITAL nurse Pariaman more half aged ≥ 30 years (53.3%), more than half are married (60%) and more than half of nurses work long executor < 5 years (52.4%). The results of this research is also

Conted...
supported by research Fajri (2016) that more than half the age of nurses implementing the PROVINCIAL HOSPITAL in Pariaman > 36 years (62.2%). Based on this it can be concluded that the age of implementing existing nurses in hospitals are there in Indonesia are on different age categories.

Based on table 2 it can be noted that more than half of the nurse perceives the transformational leadership style of head room in the PROVINCIAL HOSPITAL in Pariaman is good (59%). From the research results obtained are also transformational dimension whereby the influence of both categories of idealism 58.1% good inspirational motivation, dimensions of 53.3%, dimensions of intellectual stimulation either of 57.1%, and the dimension of Eng. considerations iVIDU fine of 50.5%.

Employee performance can be enhanced through engagement work. Work engagement is positive energy in maintaining the sustainability performance of employees. Work engagement implies that employees will be focused, dedicated and energetic when they started working, which will improve its performance (4). This the engagement work potentially increase the success and competitiveness of an organization that is so needed at this time (12). Transformational leadership is a leader who gives consideration to its individual and intellectual stimulation, as well as having the charisma (13).

Based on the results of implementing questionnaire to the distribution of nurses in HOSPITALS Pariaman indicates that the dominant component is shown by the head of the room is a component of the influence of the idealism of 58.1%. The influence of ideal, also known as charismatic, where these attributes can be observed through the behavior of leaders in the form of confidence, strength, ethical, high standard exceeds the initiator. The manifestation of the charisma of the leaders in the form of values, beliefs, and the Mission in harmony with the objectives of the organization. Transformational leaders with influence often serves as the ideal role model because such leaders admired, trusted, and respected.

Based on the results of the questionnaire also obtained that the nurses say the style of transformational kepemimpinan Head Room either, it is evident that more than half of nurses (57.1%) says that the head of the room there is helping its members in solve problems that are there in the room and provide a solution if there is indeed a problem occurs. This typifies the Head has a high stimuliasi. With the stimulation of intellectual leaders of his creativity to stimulate thinking about the relevance of manner, value system, the trust hopes to mengahasilkan idea – the idea as well as a new innovation for the Betterment of the organization.

CONCLUSION

The multivariate results of individual consideration dimensions are most prominent in relation to nurses’ involvement. Hospital management need to maintain nurse unit manager’s transformational leadership style to increase nurse’s work engagement which are finally increase hospital outcomes.

Conflict of Interest: No conflict of interest arose in this study

Source of Finding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This study has passed of the medical research ethics of the Dr. M. Djamil Hospital Padang Indonesian.

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The Influence of Application of Nursing of Spiritual Nursing to Patient Satisfaction in Regional General Hospital of Palembang and Regional General Hospital of Martapura

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¹Master of Nursing Faculty of Nursing, ²Faculty of Nursing, Andalas University of Padang Indonesian; ³Polytechnic Ministry of Health Republic of Indonesia Province of South Sumatra Indonesia

ABSTRACT

Background: The application of religious nursing care can enhance the peace of mind and patient satisfaction
in care then speeding up the healing process.

Aim: this study aims to determine the effect of the application of spiritual nursing care to patient satisfaction.

Method: This research is a type of quasi experimental research through pretest-posttest design with control
group design with total sample 44 respondents. The sampling technique uses total sampling. Data were
analyzed by using T test. This study was conducted from June 2017 to May 2018. Place of study in the
inpatient room of public hospital Palembang BARI.

Results: this study obtained that age of the respondents are mostly age range 37-65 years (old age) that is
as much 72.7%, the education of the respondents is mostly low education that is as much 79.5%, for patient
satisfaction on pre test is known mostly dissatisfied as much 70.45% and at post test patient satisfaction
change that patient satisfy as much 72.7%. The result of T test is known that p value <0.05 is 0.000, it means
that there is influence of applying spiritual nursing care to patient satisfaction.

Conclusion: the influence of application spiritual nursing care to patient satisfaction.

Suggestion: it is hoped that the head of the hospital provides training to all nurses about spiritual nursing
care so as to improve patient satisfaction.

Keywords: Spiritual Nursing Care, Patient Satisfaction.

INTRODUCTION

Patient satisfaction is an absolute must be met by
every health or hospital service provider. The hospital
will survive if it is always oriented to patient satisfaction
¹. One indicator that supports patient satisfaction is
the optimal service in running care nursing. There is an
increasing tendency of nurse model trends that require
more professional nurses. One of them is holistic
caring with spiritual nursing care to be one part of the
implications of the nursing process ². In practice, nurses
should have an active role in providing spiritual nursing
care. The ability of nurses in applying spiritual nursing
care should be supported by optimal nursing knowledge.

Meeting the needs of spirituality is something that can
not be ignored. The need for spirituality has been proven to
give patients strength in the face of their illness ³. Patients
who are in a state of course need spiritual reinforcement
and assistance during the treatment, it takes the active
role of nurses in the fulfillment of the spiritual needs of
patients while in the hospital ⁴.

METHOD

Research Design: This research is a type of quasi
experimental research with the design used is pretest-
posttest with control group design, ie there are two
groups one as the control group and one as the
experimental group ⁵. Test of research analysis using
T test. The design of this study experimental group
received the intervention while in the control group did
not intervention. Before the experimental group was
given an intervention, a pre test was conducted in the experimental group and the control group to determine the initial capability. Furthermore, in the experimental group conducted intervention in accordance with the planned, while the control group did not intervention. The experimental group was given treatment in the form of the application of spiritual care.

Population and Sample

1. Population: The population of this study is the overall object of research. The population used as research subjects are inpatients, namely in the internal medicine room and surgery room of the general hospital of Palembang BARI, which is 22 patients. While the population that became the control group were inpatients, namely in the internal medicine room and surgery room of the general hospital of Martapura area was 22 patients.

2. Sample: The sample is part of the population selected in a certain way so it is considered to be representative of the population. The sampling technique in this research is total sampling. The sample taken from this research is patient. The number of patient samples consisted of 22 experimental groups and 22 control groups.

RESULTS

Description Characteristics of Respondents

Table 1: Description Characteristics of Respondents

<table>
<thead>
<tr>
<th>Characteristics of Respondents</th>
<th>Experiment group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>Age Young (&lt;35 Year)</td>
<td>4</td>
<td>18,2</td>
</tr>
<tr>
<td>Age Old (&gt;35 Year)</td>
<td>18</td>
<td>81,8</td>
</tr>
<tr>
<td>Education Low</td>
<td>16</td>
<td>72,7</td>
</tr>
<tr>
<td>Education High</td>
<td>6</td>
<td>27,3</td>
</tr>
</tbody>
</table>

Based on table 1 above shows that the characteristics of respondents age are mostly old age in the experimental group as much 81.8% while the control group as much 63.6%. For the characteristics of education, most of the respondents have low level of education, the experimental group is 71.7% while the control group is 86.4%.

Description Patient Satisfaction On Pre Test and Post Test Implementation of Spiritual Nursing Care on Experiment Group and Control Group

Table 2: Description Patient Satisfaction on Pre Test and Post Test Implementation of Spiritual Nursing Care on Experiment Group and Control Group

<table>
<thead>
<tr>
<th>Description of Respondents</th>
<th>Measurement</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Experiment Group</td>
<td>Control Group</td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td></td>
<td>f (%)</td>
<td>f (%)</td>
</tr>
<tr>
<td>Not satisfied</td>
<td>15 (68,2)</td>
<td>16 (72,7)</td>
<td>0</td>
</tr>
<tr>
<td>Less satisfied</td>
<td>7 (31,8)</td>
<td>6 (27,3)</td>
<td>2 (9,1)</td>
</tr>
<tr>
<td>satisfied</td>
<td>0</td>
<td>0</td>
<td>20 (90,9)</td>
</tr>
<tr>
<td>Very satisfied</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Based on table 2 above shows that patient satisfaction before being given treatment (pre test) got mostly in experimental group and control group expressed not satisfied that experiment group as much 68.2% while control group 72.7%. Patient satisfaction in post test mostly in experiment group stated satisfied that as much 90.9% while control group mostly stated not satisfied as much 54.5%.

**Difference Patients Satisfaction On Pre Test and Post Test Of Experimental Group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement</th>
<th>N</th>
<th>df</th>
<th>Mean</th>
<th>T</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients Satisfaction</td>
<td>Pre Test</td>
<td>22</td>
<td>21</td>
<td>81.59</td>
<td>-17.540</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Post Test</td>
<td>22</td>
<td></td>
<td>98.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on table 3 above shows that the average score of satisfaction in the pre test of the experimental group is 81.59 and the post test of the experimental group becomes 98.59. It can be concluded that there is an increase in the average patient satisfaction score on pre test and post test. The value of significance 0.000 less than 0.05 thus concluded there is a significant difference in patient satisfaction in pre test and post test experimental group.

**Difference Patients Satisfaction On Pre Test and Post Test Of Control Group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement</th>
<th>N</th>
<th>df</th>
<th>Mean</th>
<th>t</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients Satisfaction</td>
<td>Pre Test</td>
<td>22</td>
<td>21</td>
<td>81.32</td>
<td>-2.826</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>Post Test</td>
<td>22</td>
<td></td>
<td>83.14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on table 4 above shows that the average score of satisfaction on control group pre test is 81.32 and in post test the control group becomes 83.14. It can be concluded that there is an increase in the average patient satisfaction score on pre test and post test. The significance value of 0.010 less than 0.05 thus concluded there was a significant difference of patient satisfaction on pre test and post test of control group.

**The Effect of Implementation of Spiritual Nursing Care on Patient Satisfaction at the Regional General Hospital of Palembang BARI And Regional General Hospital Of Martapura.**

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Post Test</th>
<th>N</th>
<th>df</th>
<th>Mean</th>
<th>t</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients Satisfaction</td>
<td>Experimental group</td>
<td>22</td>
<td>42</td>
<td>98.59</td>
<td>15.626</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Control group</td>
<td>22</td>
<td></td>
<td>83.14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on table 5 above shows that the average value of satisfaction in the post-test of experimental group average of 98.59 while in the post-test control group obtained an average value of 83.14. It can be concluded that there is a difference in mean value of post test satisfaction of control group and experimental group. Value p value 0.000 <α (0.05) thus concluded there is influence between applying spiritual care with patient satisfaction.

**DISCUSSION**

**Respondents Characteristic**

1. **Age of Respondents**: The result of this research is the age of 35 years old (old age), the experimental group is 81.8% and the control group is 63.6%. The explain that at the stage of late adult development has an increased spiritual need, so that nurses have an important role in completing the spiritual needs in the nursing process of the patient (7). A
The result of the research conducted that the higher of someone age then the level of expectation of the spiritual will be higher (8). The higher the level of expectations, then the level of desire to be satisfied higher, so this condition that causes the number of patients who feel dissatisfaction during the treatment took place.

2. Education of Respondents: The result of the research shows that patient education mostly is low education, the experimental group is 72.7% and control group is 86.4%. A research that high intellectual experience can provide a broader spiritual outlook that affects the health of his soul(9). In contrast to other research that there is no relationship between education level and patient satisfaction(10). According to that one outcome of higher education is satisfaction or dissatisfaction with the product or service(1). 

Description Patient Satisfaction on Pre Test and Post Test of Spiritual Nursing Application Implementation in Experiment Group and Control Group: The result of the research showed that the satisfaction of the patients before the intervention (pre test) was found mostly in the experimental group and the control group declared dissatisfied that the experimental group was 68.2% while the control group was 72.7%. Patient satisfaction in post test mostly in experiment group stated satisfied that as much as 90.9% while control group mostly stated not satisfied as much as 54.5%.

Spiritual help is an activity that a person does for help and help from the Most High. Limitations of patients caused by hospitalization cause the limitations of patients in worship one of them pray. A research which explains that hospitalized patients experience a condition of spiritual distress (11). The explain spiritual distress is a condition in which a person experiences a lack of connection with living with his or her beliefs(10). When a person is sick, feels pain or loss attacks someone, spiritual power can help a person to heal(12). The nurses need to consider certain religious practices that will affect nursing care, such as patient beliefs about birth, death, dress, prayer, and nurses need to support the patient’s spiritual. The explanation shows that religious practice is one of the needs needed by a person as an indicator of satisfaction in nursing services in the religious aspect during hospitalization (13).

Explains the existence of the relationship of spiritual needs fulfillment with patient satisfaction because it can improve coping behavior and expand the sources of strength in patient. Spiritual needs as an important factor for maintaining or maintaining a person dynamic personal relationship with God, by helping the patient in fulfillment and support in religious practice can help improve patient coping during a crisis (14). The research conducted in a study of the relationship of spiritual needs with apsient satisfaction in patients in the treatment period, 76% of respondents said they were satisfied because they have religious elements in every act of nursing, because it shows that belief or belief can give life meaning, strength, and coping for the patient (15).

Difference Patients Satisfaction on Pre Test and Post Test Implementation of Spiritual Nursing Care of Experimental Group and Control Group at the Regional General Hospital of Palembang BARI and Regional General Hospital of Martapura: The results showed that the average score of satisfaction on control group pre test was 81.32 and the control group post test became 83.14. It can be concluded that there is an increase in the average patient satisfaction score on pre test and post test.

The average satisfaction score in the experimental group pre test was 81.59 and the experiment group’s post test became 98.59. It can be concluded that there is an increase in the average patient satisfaction score on pre test and post test. The value of significance 0.000 less than 0.05 thus concluded there is a significant difference in patient satisfaction in pre test and post test experimental group.

The difference of satisfaction score scores in the intervention group according to the researcher is caused by the intervention in the form of spiritual care. Fulfillment of spiritual needs is important but in reality the fulfillment of the spiritual needs of patients is still far from being expected. The results of the current situation analysis of some literature indicate the fact that spiritual care has not been given by the nurses competently due to various factors. One is that the lack of nurses’ ability to fulfill their spiritual needs is due to the lack of nurses who have mastered the concept of spiritual nursing that nurses should have obtained since their education(16).

Implementation of spiritual care in the hospital is influenced by many factors, one of them from the nurse itself. A research obtained the result of the difference between the spiritual ability of nurses before and after given the understanding of spiritual concepts (18). The
proves that there is a significant difference of nurse knowledge in pre test and post test of experimental group\textsuperscript{(19)}.

**The Effect of Implementation of Spiritual Nursing Care on Patient Satisfaction at the Regional General Hospital of Palembang BARI and Regional General Hospital of Martapura:** The result showed that the average value of satisfaction in control group post test was 83.914 and in group of post test experiment got value equal to 98.59, it can be concluded that there is difference of mean value of post control group satisfaction satisfaction and experiment group. Value \(p\) value 0,000 < \(\alpha\) (0.05) thus concluded there is influence between applying spiritual care with patient satisfaction.

Providing intervention in the form of spiritual care shows hospitals trying to provide comprehensive and quality nursing care includes biological, psychological, social, and spiritual aspects. The nursing care affects patient satisfaction during treatment. This explains that the quality of service provided by the hospital will give a great influence for patient satisfaction, so to give kepuasaan for patients, every hospital must provide satisfactory service \textsuperscript{(19)}.

Spiritual aspect is one of the most important aspect that need to be paid attention by nurse, therefore nurses are demanded skillfully and able to do guidance of worship of patient, so hopefully when patient can perform obligation worship patient get peace of soul, enlightenment, and sense of comfort \textsuperscript{(20)}.

**CONCLUSIONS**

There is a description of the low value of spiritual satisfaction before the nursing spiritual intervention (pre test) most patients expressed dissatisfaction of 68.2\%. After the implementation of nursing spiritual intervention (post test) has increased the satisfaction of patients mostly stated satisfied that as much as 90.9\%. There was an increase in satisfaction from an average score of 81.59 to 98.59 in the experimental group after a nursing action. There were differences in outcomes performed in the intervention and control groups where the intervention group had a higher satisfaction score than the control group. In the control group with an average score of 83.14 and the intervention group 98.59 with \(p\) value 0,000.

**Conflict of Interest:** No conflict of interest arose in this study

**Source of Finding:** This study was conducted using a source of funds derived from the researcher himself.

**Ethical Clearance:** This study has passed of the medical research ethics of the faculty of medicine, Sriwijaya University Palembang Indonesia.

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Work Motivation Description of Nurses at South Sumatera Hospital Indonesia

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ABSTRACT

Work motivation of nurses is still one of nursing service problem at hospital. Low work motivation will affect the performance of nurses who are not good. This study aims to analyze the description of work motivation of nurses at South Sumatera hospital. This research type is quantitative with analytic descriptive approach. The sample of the study was 92 implementing nurses determined using proportionate random sampling technique. The data source is the nurses at South Sumatera hospital. The results of this study are known from 92 nurses can be seen 55.4% who have not good achievement, 54.3% nurses with a bad appreciation, 53.3% nurses with the development of potential individuals who are not good, 51.1% nurses with work itself is not good and 56.5% nurses with bad responsibility. More than half of work motivation factors include achievement, rewards, individual development, job self and responsibility. It is expected that the field of nursing can improve the motivation of nurses work by supervising the performance of nurses.

Keywords: Motivation, Work, Nurses, Performance and Factor.

INTRODUCTION

Motivation of nurses work is still one of nursing service problem in hospital. The motivation of nurses work at hospital III level of Ambon which have low category of 64.29% (¹). The same study conducted also showed a low motivation of nurses worker 60.1% at Bali Mental Hospital (²). Different research results reported Putri and Rosa (2015) hospital wards PKU Muhamadiyah Yogyakarta Unit II where the work motivation of nurses is low proportion is less that only 13.80% (³).

The factors that influence work motivation are fundamentally different according to the theoretical view of motivation. Motivation is influenced by basic human needs including physiology, sense of belonging, appreciation and self actualization (⁴). The job motivation based on employee type that is X employee type which is high in work motivation otherwise Y type employee is low motivated employee (⁵). Focuses on work motivation is sourced to the wishes of employees include ruling, achievement and affiliation (⁶). According to the theory of Herzberg (1950) there are two factors that affect the motivation of the nurses work namely hygiene and motivation factors. The superiority of Herzberg theory can identify whether internal and external work motivation factors affect most nurses performance. Therefore in this study the researchers used the theory of two factors.

Results of interview on September 19, 2017 with 16 nurses at South Sumatra hospital. Two nurses (12.5%) said that work motivation is categorized quite well, such as the selection of the best nurses are held every year. However, four nurses (25%) said the nurses motivation may affect performance degradation, such as the presence of late arriving nurses, returning prematurely, leaving the room during working hours, lack of cooperation with peers. As for 10 nurses (62.5%) stated that the low work motivation of nurses is due to the low appreciation in overtime and low support in career development of nurses. Based on these interviews it can be concluded that most (> 50%) work motivation of nurses in of South Sumatera hospital is low still categorized.

The above data is supported by observations made by researchers on September 23, 2017 with 16 nurses at South Sumatra hospital. The researcher found that there are still four nurses (25%) who are not on time in work, three nurses (18.75%) still lack of nurses to attitude and empathy in giving nursing service and nine
nurses (56.25%) still not complete in filling nursing care. This indicates that the work motivation of nurses at South Sumatera hospital has not been high. Based on the above phenomenon, this study aims to determine the description of work motivation of nurses at South Sumatera hospital.

**METHODS**

This research uses quantitative research design with analytic descriptive approach. Respondents in the study were 92 implementing nurses working at hospital. The sampling technique in the research by using proportionate random sampling methods where sampling will be chosen at random.

Data collection using checklists and questionnaires made by researchers based on various literature that suits the purpose of research. Measurements performed on nursing work motivation data instruments obtained by using a questionnaire. Questions of the questionnaire include achievements, awards, individual development, the work itself and responsibility performed using the likert scale in its measurement with a rating range of 1 - 4. Assessment of answers to respondents questions are 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. This study uses questionnaires which is a references from previous research conducted so that researchers do not test the validity and reliability (7).

**RESEARCH PROCEDURE**

Procedures in the implementation of this research had previously been conducted ethical testing with no 62/kepkrsmhfkunsri/2018 and approved by the Ethics Commission Faculty of Medicine Sriwijaya University. Principles of ethics based on ethical health guidelines issued by the National Commission on Health Research Ethics. Furthermore, it is also equipped with an Informed Consent sheet that contains an explanation of the purpose of the researcher about the overall implementation of the research to participating nurses as research subjects.

**DATA ANALYSIS**

Data obtained from the results of research done data processing and data analysis, data processing is done based on four stages of editing, coding, scoring and entry data to then be analyzed by using a computer. Researchers then do an analysis of the data that has been collected. Data analysis includes univariate analysis, can be done to identify frequency distribution of nurses work motivation factors include achievement, reward, individual development, job itself and responsibility at hospital. The results are presented in the form of frequency distribution tables.

**RESULTS**

Table 1: Frequency Distribution of Working Nurses Motivation Factors at South Sumatera Hospital (n = 92)

<table>
<thead>
<tr>
<th>Motivation Factors Work</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>Good</td>
<td>41</td>
<td>44.6</td>
</tr>
<tr>
<td></td>
<td>Not good</td>
<td>51</td>
<td>55.4</td>
</tr>
<tr>
<td>Reward</td>
<td>Good</td>
<td>42</td>
<td>45.7</td>
</tr>
<tr>
<td></td>
<td>Not good</td>
<td>50</td>
<td>54.3</td>
</tr>
<tr>
<td>Individual Development</td>
<td>Good</td>
<td>43</td>
<td>46.7</td>
</tr>
<tr>
<td></td>
<td>Not good</td>
<td>49</td>
<td>53.3</td>
</tr>
<tr>
<td>Job itself</td>
<td>Good</td>
<td>45</td>
<td>48.9</td>
</tr>
<tr>
<td></td>
<td>Not good</td>
<td>47</td>
<td>51.1</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Good</td>
<td>40</td>
<td>43.5</td>
</tr>
<tr>
<td></td>
<td>Not good</td>
<td>52</td>
<td>56.5</td>
</tr>
</tbody>
</table>

Table 1 shows that of 92 nurses can be seen 55.4% which have not good achievement, 54.3% nurses with bad appreciation, 53.3% nurses with the individual development, 51.1% of nurses with poor self employment and 56.5% of nurses with unresponsibilitity.

Table 2 shows that of 92 nurses most have low work motivation that is as much as 57.6%.

**DISCUSSION**

Pursuant to univariate analysis result got unfavorable work performance showed that nurses with proportion more than half that is equal to (55.4%). This result is in line with the same research conducted in RSUD Kota Tidore Kepulauan also found that most of the nurses
researchers analysis that good work will be achieved with good work motivation, the greater the work performance of the nurses, the greater the productivity and the creativity of the nurses.

In this study nurses who have awards are not good with the proportion of more than half that amounted to (54,3%). The same research that the awards are not good in hospitals dr. Rasidin Padang that is equal to (71,2%) (10). Other research that the lower the award the less productivity to the achievement of a nurses achievement. This is because appreciation is one of the factors that affect the work motivation of nurses. The researchers analysis that appreciation is needed for nurses to improve nurse performance. This is because appreciation is one of the important factors in motivating nurses work (11).

Based on the result of characteristic of individual development it is known that the percentage of nurses is not good that is equal to (53,3%). This research is in line in RSUD Senopati Bantul Yogyakarta that the development of individual potency is not good that is equal to (72,3%) (12). The Research in RSUD Raa Soewondo Pati states that every nurse needs clarity in career development respectively can be obtained through formal and non formal education in face of its future. According to the researchers analysis that the development of nurse potential is very much needed by giving opportunity for the nurses to follow the education to the higher level and get the training so that it can improve the work motivation of the nurses (13).

Univariate analysis found that the nurses who owns the work itself is not good with the proportion of more than half that is equal to (51,1%). The same research conducted in RSUD Haji South Sulawesi Province which has the job itself is not good that is as much (69,1%) (14). Other research in RSUD Sekarwangi Sukabumi District argued that where if someone feels his job itself is considered good enough, then he will feel satisfied and will automatically work well. According to the researchers analysis that good work will be supported by good work motivation because the higher work motivation will increase the spirit for the nurses to his work (15).

More than half of nurses have unfavorable responsibilities (56,5%). The same research was conducted in RSUD Tugurejo Semarang which has not good responsibility as much as (63,1%) (16). According to the theory of Mc Gregor (1960) argues that most nurses are not ambitious to achieve optimal performance and always avoid responsibility. Research in dr. Rasidin Padang stated that work motivation will create a nurses awareness of her role, responsibility and work performance of a nurses. Researchers analyze that the higher the work motivation of the nurses will be the greater responsibility in the role of work so that will form an optimal performance (10).

The result of univariate analysis shows that the low nurses work motivation is known that the percentage of nurses with the proportion is more than half that is equal to (56,5%). The same study was conducted in the inpatient ward of RSUD Raden Mattaher Jambi that the motivation of low nurses work was found as much as (63,5%) (17).

The motivation of the nurses work has the driving factors such as achievement, reward, work itself, responsibility and individual development so that it can work productively because of interest and pleasure with work, feel its work gives meaning, satisfaction and happiness but otherwise if the worker is considered a burden as coercion, something to do or as a burden, one is inclined to do the work not maximally according to Herzberg (1950) theory. According to the researchers analysis, the work motivation of the nurses can shape ones attitude in facing the situation in the workplace. High motivation to work can shape a persons attitude to be positive. Because work motivation can affect a nurses performance.

CONCLUSION

Result of research, analysis and discussion hence can be taken conclusion that more than half of motivation factors work in this research include achievement, appreciation, individual development, work itself and responsibility which is not good. It is expected that the field of nursing can improve the motivation of nurses work by supervising the performance of nurses. The researcher recommends that the next researcher can continue on the research that analyzes the relationship between the independent variable and the dependent variable by involving more variables.
Conflict of Interest: No conflict of interest arose in this study

Source of Funding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This study has passed of the medical research ethics of the faculty of medicine, Sriwijaya University Palembang Indonesia.

REFERENCES


ABSTRACT

Nursing career path is a role for nurses to work in accordance with their own clinical authority. This study aims to explore the experiences of clinical nurses in implementing career path. Design of this research is qualitative methods through phenomenology approach, with in-depth interview technique. Participants in this study were the old nurses who were taken by purposive sampling and the number was seven people. Data analysis was done by using Collaizi method. The research result got five themes; implementation career clinic nurse hampered because of the quantity of human resources, work is not suitable with authority clinical and quality of human resources, the determination of the level of career of the old nurse in Hospital Padang Panjang is based on education, experiences and special skills certificate, socialization is not optimal, the expectations of nurses to implementation of career path, and support that expected by the nurse in implementing career path.

Keywords: career path, experience, clinic nurse

INTRODUCTION

Implementation of nursing career path has been started since the issuance of regulation that regulate the nurse system of career nurse in Indonesia. According to Kornela, Hariyanto and Pusparahaju (2014), the application of nursing career level in hospital has not been done based on competency test but still situational (based on need). Implementation of the clinical nurse career path is hampered by the lack of human resources, the work is not in accordance with the clinical authority, and the low quality of human resources and special skills certificate 3) socialization is not optimal enough, 4) nurses expectation on career path implementation, and 5) Support in career path implementation in the form of managerial support and competence support.

MATERIALS AND METHOD

This study used qualitative research design through phenomenology approach with the aim to obtain a description of the meaning of the individual experiences of clinical nurses on the implementation of career path.

RESEARCH RESULT

The results of the this research are: 1) the implementation of the clinical nurse career path is hampered because of the lack of human resources, the work is not in accordance with the clinical authority, and the low quality of human resources, 2) the recognition career of old nurses based on education, work experiences and special skills certificate 3) socialization is not optimal enough, 4) nurses expectation on career path implementation, and 5) Support in career path implementation in the form of managerial support and competence support.

Theme 1: The implementation of the clinical nurse career path is hampered by the lack of human resources, the work is not in accordance with the clinical authority, and the low quality of human resources

a. Quantity of less human resources in RSUD Kota Padang Panjang.

The result of the research shows that the nursing career level of clinical nurses has not been implemented well caused by various aspects, one of them in terms of quantity of human resources, namely the lack of manpower in each room is one obstacle in the application of career nurse level in RSUD Kota Padang Panjang. This is revealed from the statements of two participants as follows:

“Difficult to apply ....becauseofthatlack of energy.... sometimeswe are his official partner with the same level of PK ... “(P.1)
“Because our power is limited... it’s hard for us to sharing the work in the room,”........ the current constraint due to less of energy (P.6).

Lack of energy perceived by the room nurse due to the distribution of nurses who are not in accordance with the needs. Distribution of nurses became ineffective because it did not take into account the workload of nurses and BOR in each room(7). Conceptually Susanto (2009) revealed that the achievement of BOR (Bed Occupancy Ratio) has a significant effect on the need of nurses staff so that the need of nurse staff needs to be taken into account through BOR level(8).

b. The division of work has not been in accordance with the clinical authority.

During this time they work using the principle of cooperation and help each other. As disclosed below :

“... Now this is not implement yet ... to serve the patients, the time is not enough ..... we do anything in our room ....” (P3)

“... When in the implementation not yet according to clinical authority .... I also do other work .... which is not my authority .... we work together to help each other ....” (P4)

“During this time we work together ..... if there are actions yaa done together ...... clinical authority ... yaaa ... not referring to it ....” (P7)

Nurses in hospitals Padang Panjang has not worked in accordance with the clinical authority due to the function of management is not optimal yet, including supervision by the supervisor, monitoring the implementation of the authority SOP clinical nurses, and there is no evaluation of the implementation of nursing career path that has been implemented.

c. Low quality of human resources in RSUD Kota Padang Panjang.

The result of the research shows that the participants have not understood the career path of the nurse. Clinic nurses only know the current level of his career, but not yet know the essence of the career path itself. This is revealed in the following participants statement:

“...not know and understand as a whole for what exactly the career path ... that I know ... I am in the career path PK II, I have not seen its function for what .. the excess is for what ,” (P2)

“... I do not know what is the use of PK-PK ...” (P3)

One cause of low knowledge of nurses in hospitals Kota Padang Panjang of the implementation of career paths due to the lack of socialization and training related to career nurses.

Theme 2: Confession of old nurse career path based on education, work experiences and special skills certificate.

a. Based on education level, working period, and special training certificate.

The result of the research proves that the nurse acknowledges the level of long career nurse career based on education, working period and special training certificate that is owned. A participant stated that the determination of the career level of the nurse clinic is based on years of service:

“Just calculated the workload and working period .... there is a certificate of training the surgical room .... so I am PK II ....”(P3)

“...... skill .... have certificate of special skill training yeah ... Ayuk join ICU adult training .... now it is Ayuk in PK II ... whereas my friends are still in PK I ... in terms of work experiences .... “(P7)

“...... now the level of PK II ...... is based on the level of education ni ... work experiences ....” (P1)

The nursing career level have taken into education, working period and special training certificates. It is already in line Minister of Health of the Republic of Indonesia (2017) that mapping or mapping is a process of determining the level of the old nurse in accordance with career prerequisites determined according to the policies of each hospital and based on the requirements of each rank by the nursing team team to determine the eligibility of the nurses at PK level according to their competence(13).

b. Not yet based on experiences

In contrast to the previous opinion, two from seven participants had a perception that career
recognition was based on educational level rather than experience. So that participants are at the level of career PK I already have experience of working long enough. perception of a participant.

“... because it was taken based on SPK education ....my experience SPK was not worth the experience of nurse D III now, ... more experience when I followed SPK in the past ....”(P4)

“Still pKI, it’s a diploma of SPK ...education...
“.... it feels if from experience is not appropriate in PK I ... but because the diploma SPK yaaa ... received ... adjustment for the diploma Ners not yet because not have STR ...” (P.5)

Career nursing mapping implemented in RSUD Kota Padang Panjang is based on the rules set by the health ministry of Indonesia, but in its application, the percentage of working period and education is too little to cause naive for nurses, nurses feel that their work experience is less appreciated. It will also have an impact on the nurse’s work spirit and performance of the nurse itself.

Theme 3: Thesocialization is not optimal yet

a. The frequency of socialization only once

The result of the interview was a statement from the participant that the frequency of socialization was once:

“previously we followed the socialization, but socialization be left socialization. If is socialized....... then applied we will know “(P1)

“Ever socialized .... before the test just that ....” (P5)

“Before the credential exam has been done socialization, but only once ... It should be in time with regular frequency.... with the socialization of course we will understand the implementation of career path” (P2)

The success of the career path program needs a strong commitment from the leadersto take steps in the implementation of the levels. One of them by doing socialization to all nurses in the hospital. Coordination of career team with committee nursing and hospital leaders are also necessary done intensively (16). According to Furedi (2009) socializations is a process that helps individuals learn and adapt about how the way of life and how to think group, so that he can play a role and functioning in groups(17).

b. Socialization does not exist yet

The following participant’s statement stated that there has been no socialization of career path application:

“There is no socialization .... I do not know what is the use of PK-PK ...” (P3)

“there is no directly notice to us .... at the time it was a test ... socialization only through ni Esi (head of the room) ..” (P4)

socialization related to the implementation of career nurse in RSUD Kota Padang Panjang has not been implemented maximally. One cause is the dual role of nursing committee members.

Theme 4: Theexpectation of the nurses on the implementation of the career path with financial and non-financial rewards

a. Non-financial rewards

The result of the research shows that the participants’ expectation is non financially, this is the following statements of the participants related to the non financial expectation who want the award based on their competence:

“Working in accordance with my authority ... work more directed ... what is my responsibility ...” (P.7)

“my hope ... can work according to the authority I have ... not the work that is shared with ...” (P1)

“Equal rewards ... eexample point credit points ....” (P.4)

The participants also hopes that there will be awards in recognition of his competence.

“The appreciation in a professional manner .... a kind of confession....in admit if we are competent in this field ... “(P.6)

“There is a professional differentiator ni ..... work according to competence and also appreciated according to competence....each competence is also diringi with their respective responsibilities ... so there seems to be differentiator professionalism ni ...”(P2)
One participant expressed his expectation on the implementation of career path in the form of self-esteem:

“Working according to my authority ...... what is my responsibility ...do not always nurse blame and considered trivial ...“(P7)

Non-financial rewards can be in the form of recognition of the competence of the nurse, the award is given based on the career development of the nurse itself. In line with the opinion of Muis (2012) said that Developing a career can be determined through non-financial rewards, the number of awards it can identifying a the right job performance so that it can be proposed to be promoted to a higher position(18).

b. Financial rewards

The results shows that the nurse has hope for the application of career path to be rewarded financially over the career level that has been owned. Some participants said they wanted different wage to be differentiated based on their career level:

“Financial may ... there are differentiators between PK I and PK II ... PK II receives more than PK I ....” (P.1)

“.... acceptance of wage in accordance with career level .. higher PK greater services received” (P.4)

“Differences of wage .. there are classes of wage ... just distinguished ..” (P.3)

Other participants expressed wanting welfare and remuneration based on their career level:

“.. There is a differentiation of professionalism, where there is professionalism in there wage ... with the PK we expect also there is a wage differentiation between PK ....” ... direction to remuneration .. “.(P.2)

“we can consider with working period......... prosperity, remuneration as at other hospitals in accordance withinitsPk” (P.5)

The financial rewards expected by the nurses in RSUD Padang Panjang is in the form of remuneration in accordance with career level or career achievement. Sarwar and Abugre (2014) in his research argued that financial rewards in the form of salaries and incentives greatly affect job satisfaction(19).

**Theme 5: Support is needed in the form of implemnetasi career managerial support functions and support competence**

a. Support from management functions

Some participants said there is already regulation but there is no control from the management:

“Regulation (SPO) ...... from the Director just a regulations... policy also exist, from the field was already there .... but the controlling that does not exist”(P.1)

One participant said there was a policy but the participants did not know whether the evaluation was carried out

“Not in the evaluation whether this is good for the patient or not,authorityclinical signature .......not only asked to work .... “(P6)

“.... We had never been asked by the management about implementation tasks in accordance with the clinical authority in the room.” (P3)

Two participants also said no preformance support a form of monitoring from the leader .... “(P6)

“Usually there is a monitoring ..... for now the case managers who do ... how we work in the room ....... how the condition of the room ..... but monitoring related to the implementation of career path not yet exist ....” (P.7)

A participant said there was no direction from management

“Maybe from the leader, from who in the higher position, for example from the management that has not been done .... guidance....... direction..... this is the problem that is managing management “(P.4)

Lack of support for the application career path in the hospital can be understood because the implementation of career path in RSUD Padang Panjang city has been began in 2015. Hospital organization has not commitment and efforts in the implementation of the career path. The career team that has been formedbut it has not done any activities to start the career path.
b. Competence support

Two participants said that they lacked the opportunity to develop their knowledge through training during their working period:

“To improve competence.....we lack the training and development of science ... I feel like a frog in a shell ....,”

“I already followed a basic training in surgical operation room .. but not the cost of the hospital .. i also have the right to attend training, to seek new sciences” (P.3)

“If the training is based on skills we can find by ourselves ...because we who need .....find by yourself...after 12 years I work have never had a chance, except for the needs of the hospital ...for example accreditation because there must be a certain certificate .. “(P.5)

“Upgrade is our science .... after4 years working there is no training .... itsimporatant for the satisfaction of science” (P.6)

Participants also said they have not had the opportunity to improve their competence through special training:

“The training opportunity has started, but for the special rooms ... if I am last BTCLS .... I am looking for myself .... other special trainings have not been thereyet .... there is no chance” (P.7)

Gorda (2004) states that education and training is a process of activities to improve and develop attitudes, behaviors, skills, knowledge and intelligence in accordance with the wishes of the company concerned[22].

CONCLUSION

The calculation formula of energy needs is less suitable because the calculation of needs is not based on the workload of nurses. This has an impact on the distribution of nurses who are not in accordance with the needs in the room so that the room with a high workload of nurses feel short of energy.

Conflict of Interest: No conflict of interest arose in this study.

Source of Funding: This study was conducted using a source of funds derived from the researcher himself.

Ethical Clearance: This study has passed of the medical research ethics of the Dr. M. Djamil Hospital Padang Indonesian.

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Description of Patient Satisfaction with Communication of Nurse Practitioner at the Hospital Dr. Rivai Abdullah Palembang Indonesia in 2018

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ABSTRACT

Background: Therapeutic communication against the patient in regard to support the healing of patients not only to provide information about her/his health but heard the complaints of the patients, such as a sense of empathy that is always followed by education in friendly service, will strongly influenced in the satisfaction of the patient.

Purpose: This research aims to know the description of the implementation of the therapeutic communication at the Dr. Rivai Abdullah’s Hospital Palembang.

Methodology: design uses a descriptive analytic design with samples of research 88 patients. This study was carried out for 6 months form 2017 June - 2018 May. This research with cross sectional approach.

Result: The result of the research it is known that from 88 respondents aged amounted to 47 people (53.4%), while it is known that education is the most respondents is low numbered 60 men (68.2%). Orientation phase amounted to 44 people (50.0%), work phase amounted to 45 people (51.1%) and termination phases totaled 53 people (60.2%).

Conclusion: the implementation of therapeutic communication at Dr. Rivai Abdullah’s hospital in the implementation of therapeutic communication with disgruntled 51.1 %. Suggestions: Expected to especially in the hospital inpatient nurses in the room to be able to maintain the communication stage therapeutic-starting from the stage of the orientation, and work towards termination of the patient being treated.

Keywords: Nurse, Therapeutic communication, quality of service, hospital

INTRODUCTION

Therapeutic communication is done always at the time of serving patients in the event of service nursing care of each patient to achieve patient satisfaction. It is really in the need to speed up the recovery and healing of patients and to avoid a condition that can cause misunderstanding between the nurse, patient and family. Therapeutic communication is very necessary at all nurses especially inpatient nurses (1). It means that patients will not feel satisfied with the service provided in a communication from the nurse is not good. It is evidenced by the results of research that has been done in the PROVINCIAL HOSPITAL of Yogyakarta data obtained more than 50% of patients who are admitted are less satisfied with the communication therapeutic committed against the nurses.

Inpatient nurse at the hospital must use therapeutic communication against patients who are hospitalized, from assessment to evaluation of the patient. Therefore, the nurse needs to develop a strategy to improve therapeutic communications against patients (2). The satisfaction of patients treated at home can impact positively in the service of the hospital to the community(3).

Very friendly service given to the hospital by nurses towards patients health care can be given not only to the patient but also given to families and communities. To
achieve optimum healing nurse must be able to meet the needs of the patient. When the nurse meets the needs of these patients there are several stages of the interaction that must be done by nurses, such as introduce myself to the patient, explain the action that will be performed, the work process, and evaluation of nursing (2).

METHODOLOGY

The design of this study used descriptive analytic design with 88 patient samples. Sampling technique using proptional random sampling method. This research was carried out for 11 months from 2017 June to 2018 May. Data were collected using questionnaires and the hospitals. The location of this research was conducted in Dr. Rivai Abdullah Hospital Palembang.

RESULT

The results of the study it is known that from 88 respondents aged (41 - 65 years) amounted to 47 people (53.4%), young (18-40 years) 41 people (46.6%). Education of the Most respondent is low (SD - SMP) amount 60 people (68,2%). High education amounted to 28 people (31.8%) on patient education. Therapeutic communication with orientation phase was found by some unsatisfied respondents as much as 44 people (50.0%) and therapeutic communication with work phase was found most of the unsatisfied respondents were 45 people (51,1%), whereas communication teraupetik with termination phase got most of the satisfied respondents were 53 people 60.2%.

DISCUSSION

The results of research on the distribution communication frequency, the age characteristics and education of nurses at inpatient care obtained from 88 respondents aged old amounted to 47 people (53.4%), while it is known that education is the most respondents is the low numbered 60 men (68.2%).

Age is the time that the existence of an object or creature either living or dead human age life is said to be fifteen years in the measure since he was born until the time the age count. So that age in the measure from birth until the present (4). Education is the process by which the community through other institutions deliberately transforms knowledge heritage and the values and skills and generation to generation (5).

The results of this research are in line with daughter of Anjana (2016) (6), which discusses the description of elderly care in meeting the social needs of personal care in Lotus werdha tresna. On the results of his research that most respondents aged 60 – 74 years totalling 33 people (45.8%), whereas those aged 45 – 59 years amounted to 22 people (30.6%), ages 75 – 90 years amounted to 13 people (18.1%) and the age of 90 years old totaled > 4 people (5.6%). Most respondents low education educational ELEMENTARY SCHOOL – JUNIOR totaled 42 people (58.3%).

According to Febriani (2014) shows that the number of respondents most patients are women with 24 (55.8%) respondents and most education is the number of patients with ELEMENTARY education as many as 20 people (46.5%) (7).

According to Potter & Perry (2005) the number of elderly in age groups increased dramatically, so that many patients admitted to health-care professionals take the time to age 50 years in health care because they should focus to identify and meet their needs (8). Whereas the communication of therapeutic in communication between patients and nurses form a therapeutic relationship, the relationship of mutual trust and make it easier for nurses to take informed decisions in addressing the health concerns. Therapeutic communication generally performed in the nurses room inpatient public hospital sultan syarif Muhammad area alkadrie, Pontianak is already good and supported by research conducted rahayu (2013) communication conducted 100 nurses % good (9).

Based on research results, related theories and related research then the researcher argues that age affects on the service in the hospital especially at the satisfaction of the patient because in old age showed low knowledge on respondents in terms of. It’s a great pain in the Home Ministry badly needed human resources to achieve the satisfaction of patients who are treated at home sick. While education affects on the quality of service at home sick to achieve satisfaction patients. because of low education showed low levels of knowledge of the patient.

In the results of research on the frequency distribution of communication teraupetik the stage orientation obtained most of the respondents are not satisfied of 44 people 50.0%, while the working stages obtained the majority of the respondents are not satisfied totalling 45 persons i.e. of 51.1% and at the stage of termination obtained most of the respondents are satisfied of 53 people 60.2%.
According to the theory that there is an orientation phase is the phase that began when the nurses meet the patient for the first time. It was the first time an patients seek help that will affect relations between nurses and patients. This phase of work is to give a chance on patients to ask, inquire, main complaint start activities in a good way and according to plan and the termination phase is the Phase in which to communicate the activities of the therapeutic conducted on nurses was summed up the results of the interviews, did the contract time, place and topics as well as ended the interview with a good way.

The results of this research line with Kusumo (2017) that discusses the influence of therapeutic communication nurse against the patient’s satisfaction at hospital. On the results of his research therapeutic communications on phase orientation numbered 57 respondents with percentage (38.14%) said it was not satisfied and therapeutic communication On the stage of the work amounted to 47 respondents with percentage (33.57%) said it was satisfied whereas the communication of terapeutik phase termination amounted to 51 respondents with percentage (36.43%) said satisfied.

Based on research of results, related theories and related research then the researcher believes that therapeutic communication on nurses with orientation phase, work and the planned termination by nurses committed to help healing patients who are treated at home and to encourage patients to work between nurses and patients in terms of satisfaction in patients.

CONCLUSION

From the results of research that has been done it is evident that the implementation of therapeutic communication in the inpatient room can heal the patient’s healing process. However, for the implementation of communication not solely in the room hospitalization but could be used in outpatient room. Therapeutic communication is communication that consciously planned aims and activities were concentrated to cure the patient. To overcome nurses who did not communicate with therapeutic then the hospital can conduct training communication therapeutic during three weeks. Then the hospital can apply inpatient room and outpatient space.

Conflict of Interest: No conflict of interest arose in this study.

Source of Funding: This study was conducted using a source of funds derived from the researcher himself.

Ethical Clearance: This study has passed of the medical research ethics of the faculty of medicine, sriwijaya University Palembang Indonesia.

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Description of Implementation of Therapeutic Communications by Nurse Implementers in Room Inside Hospital Ernaldi Bahar Palembang South Sumatra Indonesia in 2018

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ABSTRACT

Background: Therapeutic communication is very important role in nursing service, because therapeutic communication is an absolute and decisive activity for the relationship or interaction of nurses and patients in supporting the recovery of patients and find solutions to the problems that are being experienced client.

The Aims: This study aims to determine the picture the implementation of therapeutic communication by the executing nurses in the inpatient wards of Ernaldi Bahar Hospital Palembang in 2018. Methods and samples

Research: This research is descriptive with quantitative methods. Technique that used in choosing the samples was Total Sampling method. The sample size was 52 people from 5 inpatient rooms of Ernaldi Bahar Hospital Palembang for 11 months from June 2017 until May 2018.

The Result: Based on the result of research it is found that from 52 nurses, 44.2% are 36-40 years old, 78.8% female sex, 36.5% vocational education, 63.5% nurse implementing therapeutic communication well.

Conclusion: The implementation of therapeutic communication at Ernaldi Bahar Hospital Palembang in 2018 with good category.

Suggestions: Hospitals need to pay attention to nurses’ therapeutic communication in nursing service by conducting routine room head supervision to nurse executing to assess therapeutic communication performed by nurse executor to patient.

Keywords: Nurse, Therapeutic Communication

BACKGROUND

Communication plays a very important role in nursing services, because communication is an absolute and decisive activity for the relationship or interaction of nurses and patients in supporting the healing of patients. Communication within the nursing area is a process for creating relationships between health personnel and patients to recognize patient needs and determine action plans and cooperation in meeting those needs. According to Stuart and Sundeen (2001), communication is very important between nurses and clients. Communication between nurses and clients has the advantage of finding solutions to the problems the client is experiencing, and this communication is called therapeutic communication.

Therapeutic communication according to Gombong (2012) is a way to foster a therapeutic relationship where there is information and the exchange of feelings and thoughts in order to influence others. According to Kusuma (2016) Therapeutic communication is a conscious, purposeful and focused communication for the patient’s healing. Meanwhile, according to Suryani (2005), Therapeutic Communication is a communication performed or designed for therapeutic purposes. A helper or nurse can help clients to solve their problems encounter through communication. Darmawan and Andriyani (2014) found that in Mental Hospital of West Java Province found that most nurses are not in applying therapeutic communication that is 55.3%. Meanwhile, according to research that conducted by Arifin (2015) in RSUD Kota Salatiga found that as many as 72.5% nurses with therapeutic communication level is enough, less as much as 25.5% and nurses with a good level of communication only 2% this is not in line with the
results of research in RSUD Dr. Rasidin Padang, who got that 81.4% nurses are able to communicate therapeutic. Based on research Siti (2015) at RSU Rajawali Citra Bantul Yogyakarta get 49.1% nurse who communicate therapeutic well, while therapeutic communication nurse less good as much 22.8% (8).

METHODOLOGY

This research is a quantitative research. The type of research used is descriptive analytics with Cross Sectional approach. The Population in this study amounted to 60 nurses and the sample in this study amounted to 52 people that used in choosing the samples is Total Sampling method with exclusion the criteria of head of room and nurse who was on leave. This research was conducted in the hospital ward of Ernaldi Bahar Palembang. The Data were obtained from the questionnaire distribution. The data analysis includes univariate analysis; it is conducted to identify distribution of frequency of therapeutic communication implementation in the hospital room of Ernaldi Bahar Hospital Palembang

RESULT OF THE RESEARCH

Table 1: Characteristics of Nurse Executor in Inpatient Room Ernaldi Bahar Hospital Palembang Year 2018

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–25 Years old</td>
<td>4</td>
<td>7,7</td>
</tr>
<tr>
<td>26–30Years old</td>
<td>3</td>
<td>5,8</td>
</tr>
<tr>
<td>31–35Years old</td>
<td>16</td>
<td>30,8</td>
</tr>
<tr>
<td>36–40Years old</td>
<td>23</td>
<td>44,2</td>
</tr>
<tr>
<td>41–45Years old</td>
<td>6</td>
<td>11,5</td>
</tr>
<tr>
<td>Gender Kelamin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>11</td>
<td>21,2</td>
</tr>
<tr>
<td>Women</td>
<td>41</td>
<td>78,8</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>19</td>
<td>36,5</td>
</tr>
<tr>
<td>Ners</td>
<td>15</td>
<td>28,8</td>
</tr>
<tr>
<td>S2</td>
<td>18</td>
<td>34,6</td>
</tr>
</tbody>
</table>

Based on table 1 it can be seen that from 52 respondents who researched most are age 36 - 40 years (44,2%), have female gender (78,8%) and most of education level still D3 Nursing (36,5%).

Table 2: Therapeutic Communication Nurse Executor In Inpatient Room Ernaldi Bahar Hospital Palembang Year 2018

<table>
<thead>
<tr>
<th>Therapeutic Communications</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Good</td>
<td>19</td>
<td>36,5</td>
</tr>
<tr>
<td>Good</td>
<td>33</td>
<td>63,5</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on table 2 it can be seen that from 52 respondents who were researched in Inpatient Room Ernaldi Bahar Hospital Palembang, most of the nurse implementing good therapeutic communication (63,5%).

DISCUSSION

The age of respondents in this study is mostly at the age of 36-40 years (44.2%). Productive age is in the career stabilization period. Age is related to maturity and one’s ability to behave. The addition of age in the assumption of the researchers is directly proportional to the addition of the ability to take precautions, control the emotions and ability to interact or communicate. At the age of entering adulthood, usually the individual achieves mastery of mature knowledge and skills

The sex of nurses in this study was dominated by women (78.8%). This is in accordance with the general perceptions of the community that nurse jobs are more identical to women’s work. Work as a nurse requires patience, patience and affection. According to the researchers’ analysis, nurses are social work in accordance with the nature of women is sabra, able to communicate, have affection, high commitment to the service so that the nurse profession is played by women.

Nurse education in this research is mostly D III Nursing (36,5%). According to the researchers’ analysis, the largest number of nurses in the hospital is the advocacy nurse associated with the service needs and the ability of the hospital to meet the number of staff. Education becomes an individual’s ability to take responsibility for his work. The application of therapeutic communication by the nurse as a whole is good in categorical (63,5%). From the data it can be seen that most of the implementing nurses at Inpatient Room Ernaldi Bahar Hospital Palembang have done a lot of therapeutic communication well.
The implementation of therapeutic communication is not the same as social communication. Social communication does not have a specific purpose and usually the implementation of this communication just happens. Whereas therapeutic communication has a purpose and serve as a therapy for clients. Therefore the implementation of therapeutic communication should be well planned and structured. The structure of the therapeutic communication process consists of four stages: pre-interaction or preparation stage, orientation or introduction stage, stage of work, and termination stage.

CONCLUSION

From the results of this research that has been done can be concluded that the characteristics of nurses mostly aged 36-40 years, female sex dominated, the level of education is still largely DIII Nursing and most nurses implementing therapeutic communication well.

Conflict of Interest: No conflict of interest arose in this study

Source of Finding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This study has passed of the medical research ethics of the faculty of medicine, sriwijaya University Palembang Indonesia.

REFERENCE


The Headroom Experience in Resolving the Conflict in South Sumatra Indonesia 2018

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ABSTRACT

Conflict in health services occurs both in Indonesia and abroad. The head of the room plays an important role in resolving conflicts in the nursing area. If the conflict is not resolved soon will have an impact on the service. So it is needed a way or strategy head of the room in resolving the conflict. The purpose of this study is to obtain in-depth information about the headroom experience in resolving conflicts. This research design using qualitative with phenomenology. The number of participants in this study were nine participants. Data collection method in this research is with indepth interview and field notes. Method Data analysis using Collaizzi approach. The research got five main themes: Understanding the head of the room about the conflicts that occurred in the nursing room, the way the head of the room resolved the conflict, the stages in conflict resolution, barriers in resolving conflicts, Feelings in resolving conflicts. This study can be concluded that the head experience in resolving conflicts vary so quickly in resolving conflicts in the nursing home.

Keywords: Head of Room, Resolving Conflict, Experience

INTRODUCTION

Most health workers at hospital services experience conflict in work. In Switzerland, on average, every health worker has at least two conflicts with the supervisor, whereas in the United States there are more healthcare conflicts among colleagues¹ (²). In Indonesia, the exact data on this conflict in health care not yet, but Arini research (2012) at Ibnu Sina Padang Islamic Hospital as many as 90% of nurses have experienced conflicts. Therefore almost all hospitals whose health workers experience work conflicts, the leaders of hospitals and all health workers must manage this conflict well so as not to harm organizations and individuals³ (⁴).

The causes of conflicts are often found through research conducted by several researchers. According to Smith, Mazzarella and Piele (2008) there are 3 factors that cause conflict that is communication problems, organizational structure and human (⁴). Suharno (2012) reported that there are two dominant factors causing conflict, namely communication and human factor (⁵), while Margiraharjo research (2016) and Wahyudi (2015) reported the dominant cause of conflict only communication. From the above studies show that communication is the most dominant cause of conflict in many ways (⁶) (⁷). This implies that poor nurse communication has the potential to lead to conflicts in nursing services, one of which is interpersonal conflict.

RESEARCH METHOD

The method of research using qualitative research with phenomenology, participants in the study amounted to 9 headroom with the technique of taking parsisipan using purposive sampling. Data analysis Information obtained by recorded, recorded with mobile phone and voice recorder application. A verbatim transcript was made (making the interview result in written form), and the researcher interview form was obtained with the participants. Analysis of phenomenological research data can use the Colaizzi method.

RESEARCH RESULT

Based on the results of in-depth interviews about the experience of head of space in resolving conflicts in the hospital nursing room in South Sumatera Year 2018 got five themes.
Theme 1: Understanding the head of the room about the conflicts that occur in the nursing

Room Conflict is often faced by the head of the room that has been completed.

“... I think the conflict is a condition in which there are different ways of thinking of individuals .. because every human being does not have the same thoughts that will cause conflict if it happens ...” (P1)

“.. conflicts occur the thought of a different mind. because the thinking of someone gives a different picture .. well of education, ethnicity and ethnicity. “(P6)

“.... the conflict took place between one person and another person different in thinking .. if not mistaken it had happened to my staff ... the conflict was also a feeling that would be right alone .....” (P3)

Them 2: Experience the way the head of the room resolve conflicts in the nursing room Doing a discussion:

“.... at that time the problem that occurred in our room, I finish by calling the conflict and membahasa what is the problem .. I ask the conflict .... what’s wrong? .... what’s wrong? ..... the point is I ask all the problems. And doing shorts to tell them “(P3)

“The problem that nurse took place yesterday, I solved by asking what the problem was .... I instructed those in conflict to tell me everything. Dealing with the problems that exist in them. “(P7)

“.... if no one way I do together to tell what the problems that have happened .... what problem .. when happened .. that’s what I asked all the problems .. alhamdulillah they tell .. only communicative problems .... “(P9)

Them 3 : The experience of the head of the room performs the stages in the settlement of conflicts in the nursing room

Conduct assessment or analysis prior to troubleshooting

“.... at that time before brother .. hmmm .... do before resolving the conflict where I do the collection of facts in the conflict .. like the facts of the witnesses at the time or evidence that there is a sms they are the cause of the conflict ... “(P1)

“...... there was once happened, for example the nurse’s problem ... I wait for a good situation and do not talk in a crowded place in solving the problem .. we see the condition also the deck .. not good if again discuss about their problem in front of the crowd or in front of the patient .... “(P6)

“.... before the way I described earlier ... in solving the conflict first to seek evidence of the conflict .... to examine the condition of the room not to interfere or the conditions must be safe ..” (P7)

“... we collect duhulu existing information ...... before we do the settlement of the conflict, because we must know first information why the problem happened so we are not wrong in solving the problem ......” ( P9)

Theme 4: The headroom experience about the obstacles experienced by the head of the room in resolving the conflict.

Hampered by work as head of the room

“... as my head of the room a lot of work ... have not taken care of the room, staff, and patients also ... every day that we meet from 8 to 10 or 11 noon ... back room at 11 just do the chores of the room ..absen and the patient .. continue the break .. sometimes sometimes meeting again during the day .... “(P2)

“... there is a delay that I experienced is tu workload problem .. that’s often hampered if there is a problem in our room..the problem yesterday at the time of hospital accreditation .. so the meeting continued no time to sit in the room .. sometimes a lot of work outside room “(P6)

Our work is stout .. a lot of that in thought ... that’s hamabatanny .....help the staff and patients ...not meeting with kavid or ka.instalasi. not to mention yesterday there was a conflict with the hospital anniversary event so on busy busy .... “(P8)

Them 5: Feelings that have been felt by the head of the room in resolving conflicts in the field of nursing

The feeling of calm that is felt after the conflict in the room has been completed

“After the conflict is over ... the feeling is calm and
relaxed” .. in the sense that there is no more burden of mind ... my feelings feel safe (P3)

“...... I feel happy after I solve that problem .... the pleasure that everyone must feel .. because will be in our job ..” (P5)

“Conflicts after completion ... i feel calm ... can reduce our workload .. . akek ...... but i feel like happy ... calm ... no more thoughts ......” (P7)

“... it feels calm if the problem is over ... that’s the feeling that I feel .. there is also if successful in doing a job will feel calm .... workload minimize ..........” (P9)

DISCUSSION

1. Understanding the head of the room about the conflicts that occur in the nursing room: Based on the results of research on the experience of the head of the room in South Sumatera hospitals in the face of conflicts in the nursing room because of differences in thinking, differences of ideas and disputes. This is the same as explained by Marquis & Huston (2010) conflicts that occur in the workplace because of internal or external disputes where the difference of ideas between two or more people (11). Conflict occurs as a contradiction to the balance situation occurring in individuals or in the wider order, such as differences in ideas between individuals, between groups, or between communities (12). Based on the above research can be concluded the conflict can be expressed as a state of a person or group of people in a social system that has a difference in looking at a thing and manifested in behavior that is not or less in line with other parties involved in it when achieving certain goals.

2. Experience the way the head of the room to resolve conflicts in the nursing room: The results showed that the way the head of the room in resolving conflicts in the nursing room to do a way of discussing between the head of the room, katim and who have a conflict or people in conflict in the room. The results of the study are in line with Israel and Africa with in resolving conflicts with compromise styles(13) (14) (15). Compromise works towards partial satisfaction, all parties seek an acceptable solution and not an optimal one thus no one wins or loses absolutely (16). The results above can be concluded how the compromise is this action can be done if to both parties feel that both things are the same important and good relationship become the main. Each side will sacrifice some of its interests to get a win-win situation (win-win solution).

3. The experience of the head of the room performs the stages in the settlement of conflicts in the nursing room: Based on the results of the study explaining that the head of the room in resolving conflicts in the nursing room to conduct the assessment of the situation first to know the type of conflict to determine the time required and do the data pengumulan or choose the right time to resolve the conflict. Collect information / facts, where the facts collected must be complete and accurate, but also should be avoided mixed with opinions or opinions. Opinions or opinions have been entered into subjective elements. Therefore, the collection of facts must be done with caution (10). According to Vestal (1994) in Nursalam (2015), situational assessment is where identifying types of conflicts or determining the time required, after collecting facts and validating all estimates through in-depth assessments. Then who is involved in the conflict and the role of each where the situation may change (17). Based on the results of the above research can be concluded that before making a conflict resolution to collect accurate facts do not let the opinions or opinions are less clear that will cause the less obvious.

4. Headroom experience about the obstacles experienced by the head of the room in resolving conflicts: Based on the results of the study found that the obstacles that are often faced by the head of the workplace problem where the busy head of the room to resolve the conflict. The head of the room has limited time due to the responsibilities of a large room head. This is in line with the results of research conducted by Muspawi (2014) explains that in conflict management there are frequent barriers, especially work problems or busyness which is characterized by high job and high work load (18). Then it can be concluded that the obstacles in resolving conflict in the workplace or health service delivery is influenced by work and motivation. Where such barriers are often found by the leader or head of the room in resolving conflicts that occur in his staff.
5. Feelings that have been felt by the head of the room in resolving conflicts in the field of nursing: Based on the research results found that the head of the room feel happy after solving the problems that occurred in the nursing room where the head of the room felt has succeeded in his duties as a leader to take responsibility for the conflict occurred in the nursing field. The above statement is in line with the results of research conducted by Usman (2004) that happy feeling is owned by every individual where the feeling will arise if the individual feels what he has done has been successful or successful (20). Similarly, the results obtained are considered very good in the actions that have been done. The above statement in line with the results of research Indriyatni (2010) explains that the pleasure of a person seen from a positive action to others where the success of the business made by the person itself. Based on the results of the above research can be concluded that every human being in a job has a feeling happy when the problem at his work has been completed therefore Hospital in East Java said happy if the conflict has been completed (21).

CONCLUSION

1. Understanding the head of the room in resolving conflicts in the nursing room explains that the conflicts that are often faced by the head of the room in the form of differences in thoughts, ideas and disputes in which the existence of different thoughts between individuals.

2. The experience of the head of the room on how to resolve conflicts in the nursing room by discussing to discuss the problems that occur in the room, discuss the causes that occur in the room to the conflict, and choose or decide the best solution to achieve the same goal.

3. The experience of the head of the room in resolving conflicts in the nursing room has a stage of assessment, where the room kepela to identify the situation and time in mnyesai conflict

4. The headroom experience in resolving conflicts often finds barriers. Job factors can also hamper conflict resolution where the workload is overwhelming.

5. The feeling of head of the room before the problem that occurred in the nursing room after the problem has been completed the head of the room feel happy, relieved and grateful for the effort and responsibility as the head of the room has succeeded and can run amanah as head of the room.

Conflict of Interest: No conflict of interest arose in this study

Source of Funding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This study has passed of the medical reseach ethics of the faculty of medicine, sriwijaya University Palembang Indonesia.

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The Relationship of Nurse Career Application Level with the Performance of Nurse Implementers at Inpatient Room of Rsud Palembang Bari

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ABSTRACT

The performance of a good nurse is an illustration of the level of hospital service success, which indirectly illustrates the nurse’s ability to provide nursing care. This study aims to identify the relationship of nurse career application level with the performance of nurse executor at Inpatient Room of RSUD Palembang BARI year 2018. The research design used is analytic descriptive with cross sectional approach. The sample was 92 nurses and 92 SKP documents. The results show that there is a relationship of career rewards with work behavior \((p = 0.002)\), there are career development relationships, career recognition, career awards with job performance \((p=0.026, p=0.007, p=0.035)\), there is a career rewards relationship, career promotion with performance \((p=0.000, 0.027)\). The most dominant factor is career awards \((p=0.004)\). This study recommends the need for application of career nurse level that can improve the performance of nurse implementing in giving nursing care.

Keywords: Nurse Performance, Application of Career level

INTRODUCTION

Good nurse performance is the hope of all patients. According Mangkunegara (2015) performance is the result of work in quality and quantity achieved in carrying out the duties and responsibilities given to him \(^{(1)}\). The performance of the nurse is measured by the services provided to the patient so that the patient feels satisfied or dissatisfied \(^{(2)}\). So the performance of nurses is the productivity of nurses in providing nursing care in accordance with the authority and responsibilities that can be measured in quality and quantity. Assessment of nurse’s performance is a form of quality assurance of nursing service.

Performance assessment is an effort to assess the performance of nurses in the work. Work assessment is a formal system for reviewing and evaluating the performance of a person periodically serves as information about nurses’ individual abilities and helps leaders make decisions in personnel development \(^{(3)}\). The performance assessment is a tool that can be trusted as the control of human resources and productivity, but the fact is the performance of nurses into the problems in all nursing services.

The performance of nurses is influenced by various factors. According to Gibson (2008) there are three variables that affect the individual’s performance that is 1) the individual variables consist of skills, psychological variables consisting of perceptions, attitudes, personality, learning and motivation, while organizational variables consist of resources, leadership, rewards, structure and job design \(^{(4)}\). According to Ilyas (2013), factors affecting performance include personal characteristics consisting of age, gender, experience, orientation and communication style, motivation, salary, environment, organization, supervision and career development. From some references above the performance of nurses can not be separated from factors that influence it \(^{(5)}\). The optimal performance of nurses will certainly contribute to nursing services.

The nurse’s performance appraisal component is set out in Government Regulation no. 46 Year 2011 on the assessment of work performance of Civil Servants (PNS) include Employee Work Objectives (SKP), work behavior and work performance. Assessment of the achievement of Employee Work Objectives (SKP) can be seen in two aspects, namely: 1) Quantity aspect is the achievement of Employee Work Objectives (SKP) of planned target output, 2) Quality aspect is the assessment of work
behavior. From these two aspects will get the value of work achievement which is the sum of 60% x Work Objectives Employees (SKP) and 40% x work behavior. This performance appraisal is expected to improve the performance of nurses. One effort to maintain the performance of nurses remains good by applying a system of career level in the hospital. The application of career level is expected to spur the nursing profession to improve the quality of its work. In every career level nurse clinic increase has competence complexity.

RSUD Palembang BARI is a Local Government Service Agency (BLUD) of Palembang city government with Type B which is committed to improve the quality of quality health services with accreditation plenary. Currently RSUD Palembang BARI is one of the hospitals in the southern part of Sumatra province which has implemented a career-based system based on SK Menpan no. 25 years 2014. Preliminary study conducted on February 22, 2018 with respondents 20 nurses in the inpatient care unit of performance assessment components include the average score of nurse SKP of 85.03 means that nurses in nursing care is in the standard criteria, while the average nurse job behavior of 78.26 in good category and value of work performance when combined SKP score with work behavior hence got value of work performance of nurse in hospital equal to 82.71 mean value of work performance in RSUD Palembang BARI in good category.

**RESEARCH METHOD**

This research is a quantitative research. The research design used is descriptive analytics with cross sectional approach. The population in this research is nurse of executor in PDL, Class I & II, Children, Surgery, ICU, ICCU, PICU and VIP which amount to 120 people. The results of the calculation of the number of samples in this study were 92 implementing nurses and 92 of their documents Employee Performance Objectives (SKP). Determination of sample size used is proportional random sampling. Data analysis included univariate, bivariate and multivariate analysis.

**RESEARCH RESULT**

Table 1: Relationship between the implementation of career level with Performance Nurse Exsecutor in Inpatient Room in RSUD of Palembang BARI (n = 92)

<table>
<thead>
<tr>
<th>Application of the Career level</th>
<th>Nurse Performance</th>
<th>p value</th>
<th>OR (CI 95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Less Good</td>
<td>Total</td>
</tr>
<tr>
<td>Career development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>37</td>
<td>9</td>
<td>46</td>
</tr>
<tr>
<td>Less Good</td>
<td>32</td>
<td>14</td>
<td>46</td>
</tr>
<tr>
<td>Career Recognition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>46</td>
<td>16</td>
<td>62</td>
</tr>
<tr>
<td>Less Good</td>
<td>23</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>Career Award</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>39</td>
<td>22</td>
<td>61</td>
</tr>
<tr>
<td>Less Good</td>
<td>30</td>
<td>7</td>
<td>37</td>
</tr>
<tr>
<td>Career Challenges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>36</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Less Good</td>
<td>33</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td>Career Promotion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>39</td>
<td>19</td>
<td>58</td>
</tr>
<tr>
<td>Less Good</td>
<td>30</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Application of career level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>33</td>
<td>14</td>
<td>47</td>
</tr>
<tr>
<td>Less Good</td>
<td>36</td>
<td>9</td>
<td>45</td>
</tr>
</tbody>
</table>
Table 1 shows a significant correlation between career rewards and performance (p value = 0.000), with OR = 0.59 and a significant correlation between career promotion and performance (p value = 0.027), with value of OR = 0.274.

Table 2: Multivariate Modeling Analysis of Logistic Regression Performance of Nurse Executor at Inpatient Room of RSUD Palembang BARI

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>P value</th>
<th>Exp (B)</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development</td>
<td>1.463</td>
<td>0.009</td>
<td>4.321</td>
<td>1,430-13,053</td>
</tr>
<tr>
<td>Career award</td>
<td>-3.367</td>
<td>0.004</td>
<td>0.034</td>
<td>0.003-0.349</td>
</tr>
<tr>
<td>Career Promotion</td>
<td>-0.137</td>
<td>0.857</td>
<td>0.872</td>
<td>0.196-3.873</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career development</td>
<td>1.463</td>
<td>0.009</td>
<td>4.321</td>
<td>1,430-13,053</td>
</tr>
<tr>
<td>Career award</td>
<td>-3.367</td>
<td>0.004</td>
<td>0.034</td>
<td>0.003-0.349</td>
</tr>
<tr>
<td><strong>Stage 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career award</td>
<td>-3.367</td>
<td>0.004</td>
<td>0.034</td>
<td>0.003-0.349</td>
</tr>
</tbody>
</table>

Table 2 shows the value of p value <0.05 that is career reward variable (p value = 0.004) which means the most influential variable to nurse performance is career reward variable.

DISCUSSION

A. Relationship Implementation of Career Level with the Performance of Nurse Executor in the Inpatient Room of RSUD Palembang BARI: The result of bivariate analysis shows that there is a significant relationship of career awards with performance. The results of this study are in line with the research conducted by Marsudi (2013) in Fatmawati General Hospital; the result is that there is a meaningful relationship between career levels with the performance of nurse executor (7).

In the study there is a meaningful relationship between career awards with the performance of nurses at RSUD Palembang BARI. The award is a nurse’s perception of increased authority and income based on clinical nurse career level.

The most basic career development is a financial planning program that is likely to benefit employees. In addition, organizations are required to not only provide work to workers for their lives, but organizations or companies can offer useful skills and enable employees to survive in critical conditions. The rewards in the form of financial and non-financial planning will be given differently at each level in the clinical nursing care system. So according to the researchers, if the career level system implemented, then the new will appear a greater influence between the award with the performance of nurses in RSUD Palembang BARI.

The results showed there was a significant relationship between career promotions with the performance of nurses at RSUD Palembang BARI. Promotion in this research is the nurse’s perception of promotion, placement in a more interesting and beneficial position according to care nurse clinic. The reassignment to a higher position or promotion is usually followed by a raise. Promotion in nurse clinical career network system is more focused on the aspect of the competition.

According to the researchers, if the career level system implemented in RSUD Palembang BARI it will be more clear and fair in preparing nurse promotion policy. From the questionnaire it can be seen that as many as 93.5% of nurses responded well in reward items tailored to the responsibilities and 92.4% nurses responded well in career promotional items improve performance.

B. The Most Dominant Factor Relates to the Performance of Nurse Executor in the Inpatient Room of RSUD Palembang BARI: The result of
multivariate analysis shows that p value <0.05 is career reward variable (p value = 0.004) which mean from 3 variable of career tracking that entering in modeling, which have the most influence to the performance of nurse executor in RSUD Palembang BARI is career reward variables. The OR value of career reward variable that is 0.034 means that good rewards have a chance of 0.034 (CI95%: 0.003-0.349) to improve the performance of nurse in RSUD Palembang BARI hospital ward compared to bad career award.

The result of this research is in line with the research conducted by Sari (2011) of Haji Hospital in Medan, it is found that there is a significant relationship between the award and the performance of the nurse of Haji Hospital in Medan (8). The results of this study is different from the research conducted by Suroso (2011) in RSUD Banyumas, obtained the result that the career challenge is the factor most related to the performance of the nurses in RSUD Banyumas(9).

Nursing performance is based on the guidelines and standards that become the reference in nursing service. The Indonesian National Nurses Association (2010), endorsed the standards of the nursing profession as stated in Law No. 36 of 2009 consisting of competency standards and standards of nursing practice. The performance of the nurse is measured from the services provided to the patient so that the patient feels satisfied or dissatisfied (2).

The award is a nurse’s perception of increased authority and income based on clinical nurse career level. The most basic career development is a financial planning program that is likely to benefit employees. With the existence of financial planning program so employees or nurses will be encouraged to take action as possible and provide the best service, so that will impact on the performance of nurses to be increased.

CONCLUSION

There is a significant relationship between the applications of nursing career level with the performance of nurse executor. This study recommends the need for the application of career nurse level which has a positive impact in improving the performance of nurse implementing in giving nursing care. It is expected that the hospital can prepare a competency-based clinical career system that includes flow, model, and competency test.

Conflict of Interest: No conflict of interest arose in this study

Source of Funding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This study has passed of the medical research ethics of the faculty of medicine, Sriwijaya University Palembang Indonesia.

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Bioterrorism: Are the Indonesian State Defense Components Ready to Face It? (Implementation Analysis of Ministry of Defense Regulation Number 19 Year 2015)

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ABSTRACT

Background: Indonesian contextual circumstances pose various potential threats to the safety of the country. These threats are the primary cause for developing a good defense system in the country that is able to tackle real and potential threats. Defense Ministry Regulation Number 19 year 2015 classifies threats into three based on the type and duration, including hybrid threats, which one possibility is the use of biological agents as weapons in bioterrorism. Currently, bioterrorism does not receive adequate attention, owing to the fact that it has not occurred in Indonesia. Therefore, there is no defined law or programs with regards to bioterrorism.

Method: This is a qualitative analytic study. Informants were chosen using a purposive approach. It was done under the consideration that detailed information regarding readiness of the National Defense Component of Republic of Indonesia in the face of bioterrorism threats is crucial. Data collected from informants is supported by expert judgment for triangulation purpose.

Result: The results show that there are many obstacles in the implementation of the Ministry of Defense Regulations in the environment of the primary and supporting state defense components. These include no direct socialization of the primary policies which leads to poor coordination and integration between defense components. Hence, the primary aim of integrating the entire primary and supporting strength components are not well achieved.

Conclusion: Coordination between the primary and supporting state defense components overcoming the threat of bioterrorism have yet to be defined in a clear roadmap as there are obstacles in communication, coordination, and synchronization between sectors. The next step is to determine the urgency of bioterrorism, to form a consideration across sectors regarding the importance of forming regulations to encompass overcoming bioterrorism in Indonesia.

Keywords: Bioterrorism; state defense components; Indonesia;

INTRODUCTION

Regulations of the Republic of Indonesia Number 28 on Basic Human Rights states that rights to personal protection, a feeling of safety, and protection from threats is a basic human right that should be provided by the country. Based on the Ministry of Defense Regulation Number 19 Year 2015, Indonesian contextual circumstances pose various potential threats to the safety of the country. These threats are the primary cause for developing a good defense system in the country that is able to tackle real and potential threats as national security from various threats is an important pillar to the existence of the country.

The dynamic development of the global, regional, and national strategic environment, the geographical positional, natural human resources, industrial growth, and the large population of Indonesia bring changes to the spectrum of threats that are complex and affect security of the country. This causes a change in the dimension of threats, both physical and non-physical. Regulation of the Ministry of Defense Number 19 in 2015 classifies threats into three groups based on the type and duration,
including military threats, non-military threats, and hybrid threats. Continuous existence of the Indonesian Republic is greatly affected by the development of multiple threats, including hybrid threats. One possible manifestation is the use of biological agents as weapons of bioterrorism.

Bioterrorism is the deliberate release of pathological agents, such as viruses, bacteria, or other agents used to cause illness or death in humans, animals, plants, and other organisms that may affect the government or cause intimidation to a community. Bioterrorism affects the political, economic, social and culture conditions. The impact and damages caused by bioterrorism is not directly visible, as it may cause damage after some time. Furthermore, bioterrorism may lead to the collapse of administration, and the governance of the country, not only because it is highly infectious and highly effective, but also because it is very difficult to control once released.

According to the World Organization of Animal Health (OIE), 60% of bacterial diseases among humans are caused by zoonosis, bacterial diseases from animals that may infect humans, and vice versa. A more serious fact was expressed that 80% of microorganisms used as agents for bioterrorism come from zoonosis bacteria. In recent times, the world has recorded many incidence of intermittent use of biological agents especially zoonosis to perpetuate terrorism act. Center for Disease Control and Prevention (CDC) classifies biological agents that may be used as weapons into three categories: A, B, and C. This classification is based on the degree of spread of the microorganism and its ability to cause disease. This shows that the trend of biological weapon usage has been dealt with seriously at an international level.

History has noted the occurrence of bioterrorism as weapons of terror, including the use of smallpox virus, anthrax bacteria, and other organisms for terror attacks. In the United States of America, the first known bioterrorism is reportedly in 1984. An actual anthrax attack occurred in the widely remembered 2001 October postal contamination incident. The U.S. Homeland Security Department received reports of anthrax spore exposure, including 11 inhalational cases, 11 cases of cutaneous anthrax, and caused five deaths. As recently as April 2013, letters that tested positive for ricin were reportedly sent to many important figures in the U.S., one of them was to the U.S. President, Barack Obama.

It is suspected that bioterrorism has occurred in Indonesia. This was stated because few scientists believed that the H5N1 bird flu virus found in Indonesia was one hundred percent identical to the one found in Guangzhou, China. Minister of Health, Republic of Indonesia year 2004 – 2009 also called for efforts to change the mechanism of virus sharing by the World Health Organization (WHO). She emphasized that bioterrorism and agricultural terrorism is a form of modern warfare that is asymmetrical. This war is aimed at consumption and disease spread, which destroys national security, because it compromises food and health.

Firm punishments are given by international laws towards bioterrorism. This is because international laws have several different conventions that deal with this issue, which include: first, the Geneva Protocol year 1925 regarding violations to the use of chemical weapons and humanity; second, the Biologic Weapons Convention (BWC) year 1975 regarding the use and development against the production and distribution of biologic weapons; and third, Chemical Weapons Convention 1993 which emphasized on the punishments toward countries that violate the regulations. The U.S. military has compiled and published many regulations for every operation and for those employed in the field. Of these manuals, the Field Manual (FM) 3-11 is the most specific to biological agent preparation and reactions. This multi-service tactics, techniques and procedure manual focus on chemical, biological, radiological, and nuclear (CBRN) agents.

The Minister of Defense of the Indonesian Republic stated in the White Book of Indonesian Defense (2015) that the development of knowledge and technology in the field of chemistry, biology, nuclear, and explosive devices (CBRNE) increases the ownership, use, and spread of CBRNE which in reality may be important to the well-being of humans. However, these dangerous substances may have the potential of becoming threats to the security and safety of mankind if obtained by irresponsible groups of people. Moreover, it is assumed that there are several countries still producing these substances illegally and causing a threat of CBRNE to other countries. If not handled appropriately, or not controlled well, it has the potential of becoming a threat to community health, which also represent a threat to security of the country.

Successfully facing the challenges of bioterrorism threats need a multifaceted response. Based on the
Regulation of the Defense Ministry Number 19 in 2015, as mentioned above, in the face of hybrid threats, a specific pattern of defense is implemented which places the national guard (TNI) as the primary component supported by the ministry or other associated Non-ministry Government Organizations and other components of the country’s strength, including regional governments, to take strategic steps in the face of this threat in accordance with their professional and proportional abilities.

The policy on the Implementation of National Defense is not a simple process. Grindle stated in the book titled Politics and Policy Implementation in the Third World that implementation is a political and administrative process affected by two variables, including context and content. From a contextual point of view, this policy is crucial considering the complexity of hybrid threats, especially bioterrorism, which may not be accomplished by the National Guard alone as the first line of defense. On the other hand, with regard to content, the role of the National Guard is the primary line of defense and leaders of the ministry and other governmental organizations act as supporting factors in the processing of bioterrorist threats.

METHOD

This is a qualitative research study, conducted based on the consideration of the researcher to obtain detailed information regarding the preparedness of the Indonesian Republic National Defense Component in the face of threats of bioterrorism. The collected information is supported by expert judgment and documents finding for triangulation purpose.

Informants were chosen using the purposive technique, which is based on the principle of appropriateness and adequacy. Appropriateness refers to the fact that the informants are chosen based on their knowledge of the topic being researched. While adequacy means the number of informants that have been chosen is appropriate to the type and detailed information required. The purposive method was chosen as the researcher wanted a representative sample based on their anticipated richness and relevance of information in relation to the study’s research questions. Digital recordings of the interviews were translated into written transcripts, which were then simplified into a matrix based on the questions asked. Data were validated using four criteria into levels of trust, including credibility, transferability, dependability, and confirmation. This research maintained data validity through a data triangulation approach, including primary triangulation through data collection by in-depth interviews, secondary triangulation of resources through data collection from informants and comparison of data obtained from the informants. Another method of maintaining data validity is through evaluation on adequacy of references to be analyzed or evaluated as a comparison. Collected data was analyzed to identify the readiness of the Indonesian Republic defense component in the face of bioterrorism.

RESULTS

This research was performed over a span of approximately four months, beginning at the end of February until the end of May 2018. It included three phases: pre-research phase in preparation for all the requirements for data collection in the field, research phase, and data analysis phase. The analysis of the implementation of Ministry of Defense Regulation Number 19 Year 2015 among the supporting units in the face of threats of bioterrorism revealed the use of implementation theory as developed by Edward III (1980).

The research was conducted involving four primary informants from Indonesian National Military Health Center, Indonesian Army Health Center, Indonesian Ministry of Health, and Eijkman Molecular Biology Laboratory. In addition, interviews were conducted with two expert informants from the Faculty of Veterinary Medicine Airlangga University and Bogor Institute of Farming, and several associated documents were analyzed.

Communication Factors: From the communication aspect, implementation of the Ministry of Defense Regulation Number 19 Year 2015 in the informants’ institutional bodies as the primary and supporting units in the face of threats of bioterrorism have not received detailed socialization from the initiators of this policy. This was revealed by informants during the in-depth interviews conducted at different times and places.

“...never, according to me not many know about this even in the ministry, but in the faculty of veterinary medicine not yet...” (EI-2)

Most of the informants mentioned that they have not received socialization regarding the Ministry of Defense
Regulation Number 19 Year 2015. While one informant mentioned that they have received the socialization in 2017, in the form of simulation but there was no any proofs or documents about the details of the program. We can only find one news that mentioned that the simulation of Influenza pandemic has been done in 2017 and also involved other stakeholders, included Indonesian National Military.

**Resource Factors:** Resources play an important role in the implementation of a policy. Based on the research, the cooperation does not go well among the components of the national defense components and has not been planned properly in a structured manner. One supporting informant stated that resources are not a major issue. The most important is awareness and good understanding among the community regarding bioterrorism. With that understanding, then support of resources will automatically become available.

“...I don’t view resources as an issue, instead it is understanding. If understanding of this is not united, then all resources will be depleted. Resources, finances, it can all be created if there is potential, that is the context...”

*(EI-1)*

**Disposition Factors:** Based on the results, disposition factors include commitment, attitude, and tendencies in the face of bioterrorism among the involved components are stand alone and not yet integrated. One informant mentioned that the derivation of the Ministry of Defense Regulation has been compiled into TNI Commander Regulation to handle nuclear, biological, and chemical threats, and will be accomplished by the end of this year. The informants from veterinary health faculty mentioned that they inserted bioterrorism topics in the syllabus of the veterinary faculty students.

**Bureaucracy Structure Factors:** It may be concluded that the bureaucracy structure among the supporting components participate actively as defined by their job requirements in their internal areas. However, a roadmap is needed to integrate and explain this entire defense system. This roadmap becomes their guide in the future to face threats of bioterrorism.

“...So far, the components, as I mentioned, they are there but not integrated. They can be collected in the roadmap...” *(PI-3)*

**CONCLUSION**

Based on the results of the study and discussions regarding the readiness of the national defense component in the face of bioterrorism, it can be concluded that:

1. The components of the Indonesian State Defense Components are not yet ready to face overcoming threat of bioterrorism, because there are obstacles in the implementation of this regulation in the community. Therefore, the primary aim of integrating the entire primary and supporting strength components are not well achieved.

2. Health is an integral part of a country’s defense system. Thus, it requires teamwork with all aspects of national health in the efforts to support national security. To attain synergy, integrated coordination and cooperation is required, along with comprehensive policies that refer to national laws, and synergy between all aspects of national security. The Indonesian government can increase the awareness towards bioterrorism among the military and increase cooperation between military groups with important leaders in the field of community health.

3. Coordination and integration between all the involved components in overcoming the threat of bioterrorism have yet to be defined in a clear roadmap.

**Conflict of Interest:** The authors have no conflicts of interest with the material presented in this manuscript.

**Source of Funding:** The authors would like to show our gratitude to the Directorate of Research and Community Service University of Indonesia for the supports of this research.

**Ethical Clearance:** The authors declare that there is no any ethical issues that may arise after the publication of this manuscript.

**REFERENCES**


Nursing Engagement Relation with Nurse Performance at Intensive Care Unit at Surabaya Hospital

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ABSTRACT

Background: Human resources are an important component of success. The success of the hospital is strongly influenced by the performance of employees including nurses. One of the supporting factors of nurse performance is job engagement. Objective: the aim of this research is to find the correlation of nurse engagement with Performance index in ICU nurse activity at Surabaya Hospital. Method: This research is a quantitative analytic research and use descriptive design with cross sectional research method. The sampling technique used in this research is the total sampling technique that is taking data of all nurses who are in ICU. Result: The results of this study indicate that nurse engagement has a correlation with performance index.

Keywords: Engagement, Performance, Nurse

INTRODUCTION

In a hospital organization, human resources are an important component of success. Human resources need to be managed well and professional in order to create a balance between the needs of human resources with the demands and progress of the company’s business. The development of the company’s business is very dependent on the productivity of labor in the company. Every company wants a good performance from every employee. Employee performance is a factor that can determine the success or failure of the company in reaching its vision. Jex and Britt argue that performance (job performance) is a behavior of employees involved in the job. Performance (job performance) has two major categories, namely in-role (task) performance and extra-role (contextual) performance. In-role performance refers to the technical aspects of employee work. For example, a nurse is required to perform tasks such as checking blood pressure, injecting, and installing an IV. Meanwhile, extra-role performance refers to non-technical skills such as the ability to communicate effectively, show motivation and enthusiasm for workers, and help co-workers who have difficulty in doing their work. According Agustina (2009) defines performance as a result of work over a certain period compared with various possibilities, such as standards, targets / goals or criteria that have been agreed upon. Performance appraisal has an important role in improving work motivation. This performance appraisal is basically a key factor in developing an organization effectively and efficiently. According to Haryono (in Faizin and Winarsih, 2006) the performance of nurses is nurse activity in implementing the best of an authority, duties and responsibilities in order to achieve the goals of the main task of profession and the realization of the goals and objectives of the organizational unit.

In addition to good performance employees are expected to have engagement, an engagement, a desire to contribute and a sense of ownership of work and company. In general engagement is defined as the attachment of both physical, intellectual and emotional to contribute to the improvement of company performance. Gallup defines engagement as participation and enthusiasm for work. Gallup also associates employee engagement with positive emotional attachment and employee commitment.
(in Nusatria and Suharmono, 2013) gives the definition of employee engagement as a positive attitude that employees demonstrate to the organization and the value of the company9. While Schaufeli and Bakker (2010) states that work engagement as a positive thing that must be met in work and has some characteristics that are marked by the spirit (vigor), dedication (dedication) and absorption (absorption)10. The attachment that workers perceive in each characteristic will encourage the creation of a personal attachment. Workers with high levels of engagement will have a high emotional attachment to the organization, which will have an effect on completing the work and are likely to have a satisfactory quality of work11. The bound worker will be motivated to increase his productivity, accept the challenge and feel his work gives meaning to him. It will have a positive impact on worker performance, as well as for organizational productivity and growth. So it can be said that work engagement can provide changes for both individuals, teams and organizations.

Based on data from the HR department, the performance of nurses as much as 72.5% has good performance, 21% medium and 6.5% bad performance. While the target of the hospital as much as 85% nurses with good performance and no nurses with poor performance. Therefore conducted research to see one of the factors that affect the performance of work engagement. The expected result is to know the relation of engagement with nurse performance in hospital, hence can be done the work engagement improvement so that can improve the performance of nurse in hospital.

**METHOD**

This research is a quantitative analytic research and use descriptive design with cross sectional research method. Cross-sectional research method is one of the most frequent observational (non experimental) study. In a broader sense, the cross-sectional study includes all types of research whose variable measurements were performed only once at one time12. This research is to know correlation of nurse Engagement relationship with nurse performance by approach, observation or data collection. Data taken in the form of Primary Engagement nurses data in ICU which have been taken by interview using questioner following Gallup theory. Nurse performance data using hospital secondary data. This study was conducted at Surabaya Hospital in February 2018. The number of respondents who used as many as 12 nurses ICU which is Total Sampling.

**RESULT**

Based on Primary Data of nurse Engagement and Secondary Data of Performance of ICU Hospital nurse of Surabaya then got the following data.

**Table 1: Distribution of Respondents Frequency Based on Nursing Engagement in ICU Room Surabaya Hospital 2018**

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not engaged</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>Engaged</td>
<td>7</td>
<td>58.3</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Based on Table 1. it can be learned that most of the implementing nurses (58.3%) in the ICU Hospital Surabaya Room include employees who are engaged.

**Table 2: Distribution of Respondents Frequency Based on Performance of Nurses in ICU Room Surabaya Hospital 2018**

<table>
<thead>
<tr>
<th>Nurse Performance</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>8</td>
<td>66.7%</td>
</tr>
<tr>
<td>Fair</td>
<td>4</td>
<td>33.3%</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Based on Table 2. shows that of 12 nurses, most of the nurses in the ICU Hospital Surabaya had good performance of 8 people (66.7%).

**Table 3: Nursing Engagement Relations with nurse performance in ICU Hospital Surabaya Hospital 2018**

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Nurse Performance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fair</td>
<td>Good</td>
</tr>
<tr>
<td>Not engaged</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>Engaged</td>
<td>0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>33.3</td>
</tr>
</tbody>
</table>

According to Table 3. it can be learned that the more engaged nurses in ICU Hospital Surabaya, the higher the tendency of nurses to have a good performance in performing their duties in the ICU Hospital Surabaya. The results of cross-tabulation in this study indicate that nurse engagement tends to have a relationship with the performance of nurses.
DISCUSSION

Based on the results of analysis in ICU Surabaya Hospital with field observation and nurse performance data, nurses with good performance of 66.7% while the standard set by the hospital is 85% good performance. Based on cross tabulation, there is a positive correlation between work engagement and nurse performance. This means the higher the nurse’s work engagement the better the nurse’s performance, and the lower the work engagement the worse the nurse’s performance. This is in line with previous research conducted by Wahyudi (2017) stating that nurse engagement at Pariaman hospital has a positive relationship with the performance of nurses\(^1\). Another supporting research is a study conducted in Malang with a sample of 102 nurses stating that nurse’s Engagement significantly affects nurse’s satisfaction which then affects the performance and turn over intention of the nurse\(^2\). Engagement of employees is very important in improving employee initiatives in performing their duties. For example, compliance with 5 times wash-hand, when compared to forcing employees with regulation, improving engagement proves more successful in increasing employee compliance rates in hand washing\(^3\). This supports the results of table 3. Where the nurses are not Engage, the performance of the nurses is not good.

CONCLUSIONS

Based on the results of the analysis of research that has been done then it can be concluded that there is a positive relationship between employee engagement with the performance of hospital nurses ICU. In relation to the results of this study, the suggestion for the Hospital to design a training where the training can improve employee engagement and performance. Training is more directed to off-site training (training that is not related to work skills) where the training is able to revive motivation and as learning for nurses to be more familiar with their potential.

Ethical Clearance: Taken from ethic committee of faculty of dentistry, Airlangga University.

Source of Funding: Self Funding

Conflict of Interest: There aren’t any relevant conflict of interest

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Correlation of Mercury (Hg) Levels in Blood With Level of Crystatin C Serum in Traditional Gold Mining Area in Sekotong Village of West Lombok District

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ABSTRACT

The presence of gold miners in Sekotong village of West Lombok has attracted public attention since the beginning of 2008, even many who come from outside of Sekotong. Almost 50% of the 40,000 Sekotong residents are involved in activities related to unlicensed gold mining and processing. This study aims to analyze the heavy mercury (Hg) equipments in blood with serum cystatin C in West Sekotong Village of Sekotong Subdistrict, West Lombok District, West Nusa Tenggara. This research was an analytic observational study with cross sectional study design. The sample size was 18 people consist of 9 people exposed group, and control group was 9 people using simple random sampling technique. Exposed groups live in West Sekotong village and the control group lives in Kekait village. The data were collected through interviews using questionnaires and mercury test in blood using Mercury Analyzer method while Cystatin C vapor and serum test using method of Turbidimetry Immunoassay (PETIA). Data analysis using Spearmen Correlation. The results showed that mercury (Hg) content was no correlation with Cystatin C (Spearmans, p = 0,546). This study is mercury (Hg) levels have exceeded the standards in the exposed group. The levels of mercury (Hg) were not associated with levels of serum Cystatin C.

Keywords: Level of Mercury (Hg), blood, Level of Cystatin C

INTRODUCTION

The presence of gold miners in the West Sekotong village of West Lombok district has attracted public attention since the beginning of 2008, even many who come from outside Sekotong district. Almost 50% of the 40,000 Sekotong residents are involved in activities related to gold mining and processing¹. Illegal mining is difficult to stop because for local people, mining is their current livelihood, but if mining activities continue to be done then more and more mercury is wasted into the environment and cause environmental pollution around.

The mercury content of the waste gold mining waste in June 2015, it is known that the mercury content in the waste reservoir is 34,65-82,72 ppm². The high content of mercury is feared will pollute the environment. Based on Government Regulation Number. 82 of 2001 on water quality management and water pollution control, mercury content for first class water quality standard is 0,001 ppm.

The biotic component can give an idea about the physical, biological and chemical a waters. Heavy metals that often pollute the environment are lead (Pb), cadmium (Cd) and mercury (Hg) because these three heavy metals are used by most industrial production processes³. When heavy metals (Hg, Pb, Cd) enter the body, most will collect in the kidneys, liver, and some will be excreted through feces and urine⁴.

Test of Serum cystatin C has been used as one of the methods to evaluate renal function. This protein is not affected by bone mass, gender, age, or race, unlike creatinine. When the kidneys are functioning normally, serum cystatin C concentrations in the blood are stable.
But when kidney function is impaired, its concentration begins to increase. An increase in when GFR decreases and can often be detected before any measurable GFR reduction can be measured. Although much data and literature support the use of serum cystatin C.

**MATERIAL AND METHOD**

This research was an analytic observational study with cross sectional study design because of all research variables at the same time, there is no time difference between the measurement of potential risk factors and their impacts and involves measurement of exposure and its effects simultaneously on specific groups of individuals. This research was conducted in West Sekotong Village, Sekotong Subdistrict of West Lombok District, while the comparison location (negative control) in Kekait Village, Gunung Sari Subdistrict of West Lombok and testing of Hg and Cystatin C serum blood samples were conducted at Prodia Clinic Mataram. This research was conducted in December 2017 until January 2018.

The population in this study consisted of two groups: the exposed group population living in Sekotong village and unexposed groups living in Kekait Village of Gunung Sari subdistrict, West Lombok District. The sample size was 18 people consisting of 9 people from the exposed group and 9 groups unexposed. The sampling technique using simple random sampling. The data were collected through interviews using questionnaires and mercury test in blood using Mercury Analyzer method while Cystatin C vapor and serum test using method of Turbidimetry Immunoassay (PETIA). Data analysis using Spearmen Correlation to determine the correlation of mercury content with cystatin.

**FINDINGS**

**Level of Mercury (Hg) in Blood:** The test of mercury (Hg) levels in Blood was done by Atomic Absorption Spectrophotometer (AAS) method. The distribution of Hg levels in blood of respondents was shown in the table below.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hg Levels in Blood (ug/dL)*</th>
<th>Total</th>
<th>Mean</th>
<th>Deviation Standard (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 5</td>
<td>&gt; 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Exposed</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>100</td>
</tr>
<tr>
<td>Unexposed</td>
<td>8</td>
<td>88,88</td>
<td>1</td>
<td>11,11</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>44,44</td>
<td>10</td>
<td>55,55</td>
</tr>
</tbody>
</table>

* Threshold Limit Concentration of Hg in blood (WHO)

Table 1 showed the groups exposed to Hg levels in blood >5 ug/dL were 9 people (100%) with mean of 10.96 ug/dL and deviation standard 5.73. While in the unexposed group had Hg levels in blood ≤ 5 ug/dL were 2 people (22.22%) with mean of 13.46 ug/dL and deviation standard 12.10 and negative control had Hg levels in blood <5 ug/dL were 8 people (88.88%) with mean of 2.94 ug / dL and deviation standard of 1.36.

**Level of Crystatin C Serum in Blood:** Cystatin C levels in Blood were analyzed using ELISA method with a reference value of 0.57 to 0.96 mg/L. The distribution of Cystatin C counts on the respondents was shown in solid table below.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Cystatin C Level in Blood (mg/L)*</th>
<th>Total</th>
<th>Mean</th>
<th>Deviation Standard (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0,57-0.96</td>
<td>&gt; 0,96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Exposed</td>
<td>5</td>
<td>55,55</td>
<td>4</td>
<td>44,44</td>
</tr>
<tr>
<td>Unexposed</td>
<td>6</td>
<td>66,66</td>
<td>3</td>
<td>33,33</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>88,88</td>
<td>11</td>
<td>61,11</td>
</tr>
</tbody>
</table>

* Threshold Limit Concentration of Cystatin C in blood (WHO)
Table 2 showed exposed group had Cystatin C levels in blood > 0.96 mg/L were 4 people (44.44%) with mean of 1.2477 and deviation standard 0.0966. While unexposed group had Cystatin C levels in blood 0.57 - 0.96 mg/L were 6 people (66.66%) with mean 0.8255 and Deviation standard 0,1250.

**DISCUSSION**

The results showed that there was a difference of mercury (Hg) levels between exposed group and unexposed group (kruskal Wallis, p < α.). In the exposed group all respondents had mercury (Hg) above 5 ug/dL. This is because these respondents work as laborers in gold miners without permission and are indicated to come from gold miners without permission either as workers or from consuming marine life and vegetables. Unlike the unexposed group, almost all of the respondents had mercury (Hg) levels below 5 ug/dL.

The results showed that there was a difference in Cystatin C levels between exposed and unexposed groups (Kruskal Wallis, p<α.). This was supported by research conducted in Kokap Kulon Progo of Yogyakarta that gold miners (PETI) had Cystatin C levels in the blood between group exposed at an average of 1.07 mg/L and an unexposed group of 1.10 mg/L (excluding the standard 0.53-1.01 mg/L).6

Correlation of mercury (Hg) levels with Cystatin C Serum levels: Results of laboratory test of Hg levels in blood had mean 27.36 ug/dL with Deviation Standard 19.19 with range 5-10 ug/dL whereas for Cysatin C serum average 3,0620 mg/L with Standard Deviation 0,4162 with range 0.57 - 0.96 mg/L.

Furthermore, the correlation of blood Hg levels with serum Cystatin C based on analysis with Correlation Spearmens rho showed that blood Hg levels did not have a correlation with serum Cystatin C level with p = 0.546. Another research said that Cystatin C levels are not only affected by heavy metals but can also be affected by nutritional status (p=0.012) in the positive direction of the relationship.7 Internal dose is the presence of a number of xenobiotic materials in biological media interacting with the subcellular, cellular and target tissues that are influenced by genetic factors, nutritional status, sensitivity markers and immune status.3

**CONCLUSION**

Mercury (Hg) levels in blood on exposed group exceeded the standard set by WHO and the mercury (Hg) levels in blood were not associated with cystatin C serum levels.

Environment and Forestry Agency (DLHP) to take action against Unlicensed Gold (PETI) in the use of mercury (Hg) in the effort to minimize the normal weight of mercury (Hg), Agency for Health Research and Development (Balitbangkes) to conduct monitoring, Society or consumers pay more attention to the pattern of consumption of marine biota to lose weight metal and minerals (Hg) in the body and also through the air to help reduce mercury (Hg) levels, and For researchers it can be used for the things that are needed in this study and other vegetables such as fish, shrimp, crabs.

Conflict of Interest: None

Source of Funding: Indonesia Endowment Fund for Education (LPDP) which has provided financial support.

Ethical Clearance: This Study was approved by Health Research Ethics Committee of Public Health, Airlangga University.

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5. Rismawati S, I. Phytoremediation of Zn Heavy Zn Land Using Jatropha Curcas (Jatrophacurcas),

Relationship Analysis of Head Competency Competency in Implementation of Management Functions with Nurse Performance in The Application of Patient Safety Objectives in General Hospital Mayjen HA Thalib Kerinci Indonesia 2018

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ABSTRACT
The managers ability to motivate, influence, and communicate with the will determine the effectiveness of the manager. Implementation of management functions Requiring competence of the head nurse as first-line managers in the inpatient unit. This study was cross sectional among 103 nurses in the RSUD Major General HA Thalib Kerinci. This study aimed to determine the relationship of head nurse competency in performing management functions and nurse’s performance in the implementation of patient safety. This research results that the competence heads of the organization are (p = 0.007, α = 0.05) and directing (p = 0.014; α = 0.05), with most of the factors associated with the performance nurses in the implementation of patient safety was organizing (p = 0.022; α = 0.05). Head Nurse need to constantly improve competency in performing nursing management functions primarily on organizing and directing function in improving the performance of nurses in the implementation of patient safety goals.

Keywords: competence Head of the room, the nurse performance, patient safety

INTRODUCTION
Patient safety is part of the quality of health services that can be seen as an organizational system (structure and culture), management, human resources, scheduling and equipment availability. The management of the treatment room can be done well, if the head of the room has managerial ability and professional ability in managing the implementation of care services where the manager or head of the room arranges and plans room management for the management of the patient (Terry, 2013). The results of Chase (2011) study in US Hospital using descriptive study focusing on the measurement of nurse managers’ competence in 81 first-line nurse managers from 3 types of hospitals found that the competence of nurse managers play a very important role in determining the extent to which nurses play a role in all House arrangements General Illness Mayjen HA Thalib Kerinci is the only referral center hospital in Kerinci.

Hospital with type C has 16 inpatient Room From interview result about ability of head of room in carrying out management function, conducted by researcher to head of room in 6 inpatient room obtained that management function not maximal implemented, head of room and execute its management function only few item aja that is executed that is at the time of operand only, even then operan night service to morning, head of room always conduct visit with doctor, but supervision and direction to nurse executor not yet optimal, never follow activity of head room ward management, planning guidance on patient safety goals because they do not have guidelines. where the activities performed by the head of the room only report the event only if an unexpected event occurred to the Hospital Patient Safety Committee. The head of the room does more work, which often happens to be medication errors, surgery errors, procedures and nosocomial infections (Classenet al, 2011). Based on the above background, to improve work productivity, performance and effectiveness is closely related to the competence of the head of the room in running the nursing management function.

METHOD
This research is a quantitative research with approach cross sectional. The population in this research is all the nurses in the inpatient ward that amounted to 139 people in RSU Major General ThalibKerinci Technique.
The sampling of the research using proportional random sampling with the sample number of 103 nurses, where the criteria inclusion in this study is the
1. Nurse executor in the inpatient room
2. Not being on leave/education
3. Willing to be the respondent

The research was conducted in June 2017.

RESULTS

The characteristics of age nurse yang have age ≤ 35 years more that is 83 (80.6%) than age 35 years old. The respondents were dominated by 70 (68%) female nurses with the highest level of vocational education (D3 nursing) of 77 (74.8%), the working period of most ≤ 5 years was 60 (58.3%), and the respondents who had attended the training sebanyak 89 (86.4%).

Table 1: Distribution of Respondents Frequency Based on the Competence of Room Chief in performing management functions at Inpatient Installation of Major General Hospital HA ThalibKerinci

<table>
<thead>
<tr>
<th>Competency Head Nurse</th>
<th>Frequencies (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>49</td>
<td>47.6</td>
</tr>
<tr>
<td>Good</td>
<td>54</td>
<td>52.4</td>
</tr>
<tr>
<td>Organizing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>35</td>
<td>34.0</td>
</tr>
<tr>
<td>Good</td>
<td>68</td>
<td>66.0</td>
</tr>
<tr>
<td>Direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>44</td>
<td>42.7</td>
</tr>
<tr>
<td>Good</td>
<td>59</td>
<td>57.3</td>
</tr>
<tr>
<td>Supervision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>51</td>
<td>49.5</td>
</tr>
<tr>
<td>Good</td>
<td>52</td>
<td>50.5</td>
</tr>
</tbody>
</table>

Based on table 1 shows that the competence of the head of the room in the implementation of management functions according to the assessment of nurses implementing less good as much 54 (52.4%) more than good nurses. The nurse assessment that the function of the management of the head of the room in the planning function is not good as much as 49 (47.6%), the organizing function is considered less good as 35 (34%), the assessment function is considered less good respondent as much as 44 (42.7%), and supervisory function is considered not good as much as 51 (49.5%).

Table 2: Distribution of Respondent Frequency Based on the Implementation of Patient Safety Target at Inpatient Installation Hospital MayjenHA ThalibKerinci

<table>
<thead>
<tr>
<th>Implementation patient safety</th>
<th>(f)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Identification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>45</td>
<td>43.7</td>
</tr>
<tr>
<td>Good</td>
<td>58</td>
<td>56.3</td>
</tr>
<tr>
<td>Effective Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>42</td>
<td>40.8</td>
</tr>
<tr>
<td>Good</td>
<td>61</td>
<td>59.2</td>
</tr>
<tr>
<td>Precautions high alert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>34</td>
<td>33.0</td>
</tr>
<tr>
<td>Good</td>
<td>69</td>
<td>67.0</td>
</tr>
<tr>
<td>Exact location, procedure and patient when operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>26</td>
<td>25.2</td>
</tr>
<tr>
<td>Good</td>
<td>77</td>
<td>74.8</td>
</tr>
<tr>
<td>Control and Prevention of infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>49</td>
<td>47.6</td>
</tr>
<tr>
<td>Good</td>
<td>54</td>
<td>52.4</td>
</tr>
<tr>
<td>Prevention risk fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Good</td>
<td>45</td>
<td>43.7</td>
</tr>
<tr>
<td>Good</td>
<td>58</td>
<td>56.3</td>
</tr>
</tbody>
</table>

Based on table 2 shows that the nurse’s performance in applying the patient’s safety objectives is good. Implementation of patient safety goals in good patient identification as much as (56.3%), improvement of good effective communication as much as (59.2%), Improvedawareness high alert (67%), exact procedure, 8%), Control and prevention of infection both as much (52.4%) and risk prevention fell well (56.3%).

Table 3: Relationship Analysis Competence of the head nurse with the performance of nurses in the application of patient safety goals

<table>
<thead>
<tr>
<th>No.</th>
<th>Competency Head Nurse</th>
<th>Implementation patient safety</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Less good</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>2.</td>
<td>Organizational</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>42</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Less good</td>
<td>11</td>
<td>24</td>
</tr>
</tbody>
</table>
Based on table 3 indicates that there is no correlation between the head room’s competence in the planning function and the performance of the nurses in applying the patient’s safety objectives (p = 0.0499) there is relation of head room competence in organizing and directing with nurse performance in patient safety target (p = 0.007 and p = 0.0014), and there is no relationship of competence in supervision with the performance of nurses in the target of patient safety (p = 0.0492).

Final Modeling of Logistic Regression Results on Competency Head Nurse in Implementation of Management Function with Nurse Performance in Application of Patient Safety Target in Major General H. Thalib Kerinci Hospital 2017 (n = 103)

The variables that have a significant relationship with the performance of nurses in the implementation of patient safety goals is the function of organizing and directing function (p < 0.05: α 0.05). The results of the analysis obtained the highest OR is the direction (OR = 2.317) so it can be concluded that the competence of the head of the room in the function of direction is the most influential factor on the performance of nurses in the application of patient safety sasran. The result of OR can be interpreted that the executing nurse who evaluates the competence of the head of the room in a good briefing function will have the opportunity to perform a good performance in the application of the patient’s safety target of 2.317 times higher than the nurse who assessed the less directed function after controlled by the organizing function.

**DISCUSSION**

1. **Relationship of Head Competency Room in Function of Planning with Performance of care in applying patient safety target:** Based on the result of research, there is no significant relation between competence in function of head of room planning with nurse performance in applying patient safety target (p = 0.499), where p > 0.05. This result is in accordance with Darwito research (2012), that there is no significant correlation between the implementation of head room planning function with nurse performance (5), and Kusumas research (2015) there is no correlation between the function of headroom planning with the performance of nurse executing (p = 0.89) (6). This is because the nurse in providing nursing care is still fragmented on certain types of tasks, so that the work performed by nurses is still routine and not well planned. This is also because most nurses are vocational (74.8%) where the operational nursing personnel in the targeting of patient safety target with the most working period is 5.3% as much as 58.3%, where the experience is still less including the sense of responsibility answer.

2. **Relationship of Head Competence Room in Organizing Function with Nurse Performance in the implementation of patient’s safety objectives:** Based on the result of research, there is a significant relationship between competence in head organizing function with nurse performance in the implementation of patient safety target (p = 0.007), where p < 0.05. The results of this study are not in accordance with the research Kurniadi (2013) there is no relation between the function of organizing the head of the room with the performance of nurse executor (p = 0.83) (6).

Organizing is the determination of the work to be done. Grouping tasks and handing out work to every staff, establishing departments and establishing relationships. According to the researcher’s assumption, the competence of the head of the room in the organizing function needs to be improved to achieve the objectives systematically so that there is clear division of tasks, there is good coordination, there is one command unit, and there is a division of responsibilities and authority in accordance with the abilities and skills of the nurse so that a relationship exists between the nurse and the head of the room.

3. **Relationship of Head Room Competence in Direction Function with Performance of nurses in the implementation of patient safety goals:** Based on the results of the study, there is a significant relationship between competence in
the function of head direction of the room with the performance of nurses in the implementation of patient safety goals \((p = 0.014)\), \(<0.05\). The results of this study in accordance with research Craven (2012) that there is a significant relationship between the head direction of the room with the application of patient safety \((p = 0.008)\).

The direction function is for the nurse or staff to do what they want and should do. Elements in direction consist of mutual motivation, problem-solving, delegation, effective communication, collaboration and coordination (Terry & Rue, 2010) \(^1\). The results of this study are not in accordance with the research Kurniadi (2013), that there is no relationship of head direction function with the performance of nurses \(^6\). According to the assumption that the competence researchers must have in the direction function requires the head of the room to communicate with the nurse implementer for the purpose can be achieved. Briefing can create a good working climate.

4. **Connection Head Competency in the Supervisory Function with Nurse Performance in the application of patient safety goals:** Based on the result of research, there is no significant correlation between head room competence in supervision function with nurse performance in applying patient safety target \((p = 0.492)\), where \(p > 0.05\). The results of this study according Wibowo (2013) that there is no relationship control function with the implementation of nursing care \(^8\). Similarly, research Kurniadi (2013) that there is no relationship of head room supervision function with the performance of nurses \(^6\).

**Conflict of Interest:** No conflict of interest in this study

**Source of Finding:** This study was conducted using a source of funds derived from the researcher himself

**Ethical Clearance:** This study has passed of the medical research ethics of the faculty of medicine Andalas University Padang Indonesia

### REFERENCES


Nutrition Education Using my Plate Media to Improve Self-efficacy and Parental Support towards Children in Full-day Primary School and Non-Full-day Primary School

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ABSTRACT

Nutrition education approach is one of many ways that can be done to change people behavior, mainly regarding in health. There is still lack of nutrition education towards school children by the school because of human resource, facilities, and financial matters. Nutrition education using MyPlate media can help children to choose nutritious food. Nutrition education were given by attractive counseling using audio-visual and cooking demo based on MyPlate food guide. Balanced meal nutrition education using MyPlate are expected to be internalized inside children’ mind. Participants of this study were 50 students from public and private primary school in Surabaya. Data for this study were gathered using pretest and posttest. Pretest was given before and posttest was given after nutrition education process in order to evaluate the result. To compute the data ANOVA statistical test was used. The use of ANOVA statistical test revealed that after nutrition education, students’ knowledge towards MyPlate concept significantly increase in each food group: main food (p-value=0.004), vegetable (p-value=0.002), and water (p-value<0.001). Moreover, nutrition literacy score and literacy about MyPlate also significantly increase with each of it has p-value<0.001. This study showed that there was significant improvement in children literacy about MyPlate food concept before and after nutrition education process has given.

Keywords: Children-school age, MyPlate, nutrition education, balanced nutrition

INTRODUCTION

Children around the world suffering malnutrition. More than 25% children in third world countries are stunted(1). Stunted children cannot grow well. Stunted children have shorter height compare to normal children in their age. Moreover, stunted in children associated with sub-optimal brain development causes weakening in brain cognitive development, study and career achievement in the future(2). The majority of developing country experienced nutrition phenomena known as nutrition transition. Nutrition transition happened when the population adopting modern lifestyle while social-economy, urbanization, and acculturation aspect are emerging(3). Popkin (2002) suggested that double burden of malnutrition in household correlated to urbanization. When urbanization occurred, household family income increased and affected their ability to buy more food, there is an increase in quantity but not in quality. Energy-dense food but low micronutrient and protein effect children’s growth, especially in children height. Meanwhile in the side of mothers, if mothers eat high-dense food but do low physical activity then the risk of obesity and weight-gain will be higher. As the fourth most populated country, Indonesia undergo double burden of malnutrition. Prevalence of stunted children in Indonesia was 36,8%, 35,6%, and 37,2% consequently in 2007, 2010, and 2013(5).

Mothers play important roles in supporting family nutritious intake. It is important, in a way that most
of mothers are known to prepare and arrange food for their family. In the early stage of life, children are not able to choose their own food, therefore mothers play role in here, to help them choose the right and nutritious food. Savage et al. (2008) stated that parents powerfully shape children’s early experiences with food and eating, providing both genes and environment for children. Children’s eating patterns develop in the early social interactions surrounding feeding(6). In Indonesia, balanced food recommendation previously socialized in 2009 by the Ministry of Health. Specifically, they promote MyPlate concept which regulated in PERMENKES. However, people especially mothers are still lack of understanding in implementing MyPlate concept. MyPlate is a reminder to find our healthy eating style and build it throughout our lifetime. MyPlate emphasizes five food groups: fruits, vegetables, grains, protein, and dairy products. Consuming balanced each of these food groups as recommended in MyPlate helps to build and maintain healthy bones(7).

Nutrition education is one thing that can be done to changes one’s behavior especially towards health. We see that it is important to introduce nutrition education to young people especially children school-age. Nutrition education in school age best given when collaborates with community who interact mostly with the kids, which is school. In line with Bezerra et al. (2017) statement that school can act as an enabling environment for the promotion of healthy eating behaviors and the practice of physical activity. Unfortunately, in Indonesia, there is still lack of nutrition education towards school children because of the lack of school resources such as human resource, facilities, and financial matters. The involvement of the school community represents a main role in social support to children and adolescents(8).

Al-Muslim school is one of institution that served full-day school concept and had been declared as ‘Healthy Promoting School’ since 2008. They applied green education concept and nutritious food implementation to their student. Meanwhile, SDN Sidotopo Wetan I is a public school run by the government of Surabaya. This school is not full-day school thus they don’t provide any lunch activity together. Therefore, MyPlate concept never been socialized in SDN Sidotopo Wetan I. Compare to Al-Muslim, the number of student in SDN Sidotopo Wetan I is larger. Hence, activity to improve student’s literacy about MyPlate concept is needed importantly, looking at large number of students in SDN Sidotopo Wetan I who unfamiliar with MyPlate concept.

The objective of this study is to improve children self-efficacy, MyPlate and nutrition literacy also parents support towards nutritious food intake for their children using MyPlate concept. To improve and change ones’ behavior, especially children, the programs must be fitted into the family, school, and community setting, in order to improve effectiveness(9,10). To effectively promote healthy nutrition in children school age, we must better understand the determinants of their behaviors and change in these behaviors. One important theory of behavior change is Bandura’s Social Cognitive Theory (SCT). Bandura’s SCT is an interpersonal theory that emphasize mutual interactions of persons, behavior, and environment(11). The SCT is relevant to health communication. SCT provides a framework for designing, implementing and evaluating programs. Evaluating behavioral change depends on the factors environment, people and behavior. The SCT includes all constructs that are both internal to individual (e.g., self-efficacy, goals) as well as external (e.g., social support, environmental influences)(12). All of the three factors, environment, people, and behavior are constantly influencing each other. Behavior is not simply the result of the environment and the person, just as the environment is not simply the result of the person and behavior(13). The theory deals with cognitive, emotional aspects and aspects of behavior for understanding behavioral change. The concepts of the SCT provide ways for new behavioral research in health education. Ideas for other theoretical areas such as psychology are welcome to provide new insights and understanding.

In this study, we try to improve children self-efficacy to change the behavior to consume nutritious food. Self-efficacy is fundamental to the process of behavior change in that confidence in ones’ abilities can provide the motivation necessary to follow through with a change in behavior. Self-efficacy conceptualizes a belief in personal capabilities to organize and execute the courses of action required to attain a behavioral goal(14). Additionally, self-efficacy is important because it influences several other SCT variables(13). Consistent evidence indicates that self-efficacy is a mediator of behavior change Bandura suggested four specific antecedents of self-efficacy beliefs: enactive mastery experience, vicarious experiences verbal persuasion and physiological/affective states(15). According to Bandura (1997) nutrition interventions will be more successful if they strengthen individuals’ knowledge of the topic,
improve environmental factors, encourage self-efficacy, develop the use of self-regulatory, and the interventions are appropriately prepared for demographic groups. In this study, we highlighted three antecedents in Bandura’s SCT to improve self-efficacy in Al-Muslim and SDN Sidotopo Wetan I, mastery experience, verbal motivation, and vicarious experience. These three strategies then elaborated into education activities given to students. We expected there will be positively correlation between nutrition educations about MyPlate and student’s improvement in self-efficacy and also parental support.

MATERIAL AND METHOD

Site and Subject of Study: This study done in two different places, Al-Muslim Fullday Private School and Sidotopo Wetan Non-Fullday Public School. The participants of this study were 50 school-children in each school who divided into 5 groups consist of 10 students. In each group, there was one nutrition educator as a guide during education process. This nutrition educator played a role to help and ensure children to be aware and understand about MyPlate concept. Students and mothers who participated in this study in informed consent. This study has been approved by The Health Research Ethics Committee of Faculty of Public Health Airlangga University with registered number 159-KEPK and date of approval 26 April 2017.

Pre and Post-Test: The design of this study is using single-group pretest and posttest design. Assessment of pretest was done before intervention given. Assesment of posttest given after the children received nutrition education. To determine initial associations among the nutrition education, student’s self-efficacy and parents support, Pearson product-moment correlations were estimated using SPSS (v.21.0). Afterward, to compute the data t-test and ANOVA statistical test were used.

FINDINGS

The result of ANOVA statistical test showed significantly improvement in students’ food grouping competence and literacy after the nutrition education intervention was delivered. The p-value result of the variables showed positive correlations. Students’ ability in classifying different food groups was improved. As can be seen in table 1, in main meal food grouping the p-value=0.004, vegetable p-value=0.002, and water p-value<0.001. Moreover, nutrition literacy score and MyPlate literacy score was significantly increase with each p-value<0.001.

<table>
<thead>
<tr>
<th>Table 1: Chi Square Statistical Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Grouping for Staple Food</td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
<tr>
<td>Grouping for Vegetables</td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
<tr>
<td>Grouping for Fruit</td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
<tr>
<td>Grouping for Side-Dish</td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
<tr>
<td>Grouping for Water</td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
<tr>
<td>Grouping for Sugar Salt and Fat</td>
</tr>
<tr>
<td>Correct</td>
</tr>
<tr>
<td>Incorrect</td>
</tr>
</tbody>
</table>

In table 2, increased MyPlate literacy score from 3.97 to 4.48, nutrition literacy score from 2.36 to 3.96, and self-efficacy score from 149.69 to 168.43. P-value of both total score in MyPlate and Nutrition Literacy is <0.001 which mean there was correlation between the nutrition education and total score in MyPlate and Nutrition literacy. But, in self-efficacy the p-value 0.385.

<table>
<thead>
<tr>
<th>Table 2: ANOVA Statistical Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Total Score for My Plate</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total Score for Knowledge</td>
</tr>
<tr>
<td>Total Score for Self-Efficacy</td>
</tr>
</tbody>
</table>
Al-Muslim had higher average score rather than Sidotopo Wetan I considering most of the Al-Muslim students were already aware about health information. Posttest assessment in Sidotopo Wetan I was increase significantly, more students acquired better score in MyPlate literacy. This result might be affected because of participants’ characteristics. In Sidotopo Wetan I, most participants were 6th grade which could contribute to better comprehension. Meanwhile, Al-Muslim participants had more disparity from 3rd until 6th grade students.

For the posttest in nutrition literacy, the average score of nutrition literacy in Al-Muslim students were higher compare to Sidotopo Wetan I. The average score in Al-Muslim was in 3 meanwhile Sidotopo Wetan I was in 2. Therefore, we can conclude that there was significant improvement from pretest to posttest score about nutrition literacy.

Al-Muslim score was increase into 5, which was the maximum score and so did as Sidotopo Wetan I which improve into 4. There was significant improvement in Sidotopo Wetan I meanwhile Al-Muslim did not increase as significant as Sidotopo Wetan I. Nutrition literacy in both school were significantly improved after nutrition education was given.

Outcome of this study is to change students’ behavior with parental support to be able to consume nutritious food based on MyPlate food guide. To start eating healthy from such early stage of life will reflects in adolescent health status. Healthy eating habit will help dealing with the complexity of the health problems in adolescents’ life stage.

Both school improved in before and after intervention showed on pretest and posttest score. However, Sidotopo Wetan I public school showed more significant improvement in pretest and posttest score compare to Al-Muslim private school. It may be related because before intervention, Sidotopo Wetan I students were less aware about health, compare to students in Al-Muslim private school who were previously familiar about health. Al-Muslim private school had practicing eco-green education as a health promoting program since 2008. Therefore, Al-Muslim’s students will likely have better comprehension about nutrition literacy rather than Sidotopo Wetan I public school. Thus, when education was given, Sidotopo Wetan I showed more significant improvement. However, in posttest result, Al-Muslim had higher score rather than Sidotopo Wetan I.

It is related to Al-Muslim healthy school practices since 2008, it encourages students to be more aware about health and it is reflected in posttest score compare to Sidotopo Wetan I.

Although there was score improvement with self-efficacy but there was no association between the intervention given and the improvement. It might be occurred because of the duration of intervention was not long enough to give the impact. In this study, nutrition education was given for one-month long. Meanwhile, some studies gave longer duration. Study conducted by Murimi et al. (2017) occurred for 5 months and succeed in improving self-efficacy in school children. Also, study by Jarpe-Ratner et al. (2016) found that ten-weeks nutrition education to student was effective in improving children’s self-efficacy. Thus, in the future researchers can considered to give longer duration to increase and improve self-efficacy towards school children.
CONCLUSION

Nutrition education based on social cognitive theory is an effective model from which to explore influential construct of health behavior. Intervention using nutrition education with MyPlate media and attractive activities give significantly improvement in nutrition literacy and MyPlate literacy of students in private and public school. Longer duration of intervention might be needed to significantly improve children’s self-efficacy,

Conflict of Interest: Authors have no any conflict interest with other researcher nor institutions

Source of Funding: This research is self-funded

Ethical Clearance: This study is approved by The Health Research Ethics Committee at Faculty of Public Health Universitas Airlangga

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Medication Error Based on Nurse Knowledge at Inpatient Unit of Surabaya Private Hospital

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ABSTRACT
Medication error is one of the factors that cause the incidence of medical error. The parties who were responsible for these cases are nurses. The purpose of this study is to describe the incidence of medication error based on the knowledge of nurses at the inpatient unit of Surabaya Private Hospital. This is an observational descriptive research. Based on the time of study this was included as cross sectional study. The respondents were 63 nurses. The data were collected by questionnaires and observational guidance. Data analysis was conducted by cross tabulation analysis. The results of this study are most of the respondents were in the age range of 20-40 years old. Most of the respondents were female. The last education of most of the respondents was Diploma-III. The most of respondents have worked for more than 10 years. The respondents who have good-knowledge are in Class 2 room, while the respondents who have poor-knowledge are in Kids room. In overall of the room, the knowledge levels of respondents are poor. The conclusion of this study is the incidences of medication error are more happening in the room with poor level of respondent’s knowledge and fair level of respondent’s knowledge.

Keywords: medication error, knowledge, nurse, inpatient

INTRODUCTION
Medication error is an incident that can be detrimental to patients which can actually be prevented. This medication error is the result of drug use, action, and treatment as long as the patient is handled by health personnel.¹ Medication error itself is one of the common factors that can cause a medical error.²

These incidents are most common in hospitals. According to Kinninger (2003), about 7000 people were died annually due to the medication error. Another study conducted in United States, found that the incidence rate of medication error between 2-14% of the number of patients treated in hospital. This was happened because the wrong prescription is about 1-2% and it was causes losses to the patient. Another study says that about 7000 patients were died every year in United States due to medication errors. According to a recent report from the National Audit Commission Report on Patient Safety, medication error (7% of all medical error incidents) is the second most common factor of incidents that endanger to patients after a patient falls.³ Based on the Rule of MOH RI Number 129/Menkes/SK/II/ 2008 on Minimum Service Standards of Hospital mentioned that the incidence of medication error should be 100% not exist or not happen. This means that in providing health services, medication error should not be happened at any.

This case of patient safety is also still found in Surabaya Private Hospital. The place of highest incidence of patient safety is in the inpatient unit. The increases were happened from 2016 to 2017 is from 24% to 33.8%. In period of January-March 2017, inpatient unit of Surabaya Private Hospital has the highest number that contributes the number of patient safety incident. While the most frequent patient safety incidents in period of January-March 2017 in the inpatient unit were the incidents of medication error-related, that is 78% of the total patient safety incidents at inpatient unit of Surabaya Private Hospital.

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Medication errors can happen in every stage of treatment. According to the National Patient Safety Agency 2004, medication error in the administration error stage is the type of error that gives the worst impact compared to other types of errors. These errors are also common. The party that has a role in this case is nurse. Nurse should be aware on drug delivery safely including safe doses, side effects of medication, alertness to drugs that have similarities of both name and appearance and the ability to educate patients and their families about medication.3

Based on these data, the research problem found is the incidence of medication error at Inpatient Unit of Surabaya Private Hospital by 78% in period from January to March 2017. Thus, this study aims to describe the incidence of medication error based on nurse knowledge at Inpatient Unit of Surabaya Private Hospital.

METHOD

This study is an observational descriptive research with the cross sectional approach. Samples of this study were 63 nurses. This research was conducted at inpatient unit of Surabaya Private Hospital and conducted in April - December 2017. Technique of data collection is conducted by questionnaire and observation for primary data. While secondary data was collected from report document of patient safety incident in period from January to December 2017. Data analysis is conducted descriptively.

RESULTS

Based on the data of the research results it can be seen that the characteristics of respondents based on age, gender, last education and length of working at Surabaya Private Hospital are as follows:

Table 1: Frequency Distribution of Respondent's Characteristics based on Age, Gender, Last Education and Length of Working

<table>
<thead>
<tr>
<th>Respondent’s Characteristics</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-40 Years old</td>
<td>46</td>
<td>71.6</td>
</tr>
<tr>
<td>41-60 Years old</td>
<td>17</td>
<td>28.4</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100.0</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>6</td>
<td>9.0</td>
</tr>
<tr>
<td>Women</td>
<td>57</td>
<td>91.0</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100.0</td>
</tr>
<tr>
<td>Last education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-III</td>
<td>37</td>
<td>64.7</td>
</tr>
<tr>
<td>S.Kep.Ns</td>
<td>26</td>
<td>36.3</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100.0</td>
</tr>
<tr>
<td>Length of work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 Year</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>1-5 Years</td>
<td>23</td>
<td>35.8</td>
</tr>
<tr>
<td>&gt; 5-10 Years</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>&gt; 10 Years</td>
<td>35</td>
<td>55.2</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017

Based on Table 1, it can be seen that most of respondents are aged between 20-40 years as many as 46 respondents (71.6%). This range of ages is included in the early adult age category. Most of respondent’s genders are female that was 91%. Most of last educations of respondents are DIII that was 56.7%. Most of respondents have been working in the inpatient unit of Surabaya Private Hospital for more than 10 years that is 55.2%.

Table 2: Frequency Distribution of Respondents’ Knowledge about Medication Error and Drug Delivery in Each Room of Inpatient Unit of Surabaya Private Hospital, 2017

<table>
<thead>
<tr>
<th>No.</th>
<th>Room</th>
<th>Nurse’s Knowledge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Poor N</td>
<td>%</td>
</tr>
<tr>
<td>1.</td>
<td>Class 1</td>
<td>2</td>
<td>15.4</td>
</tr>
<tr>
<td>2.</td>
<td>Class 2</td>
<td>1</td>
<td>10.0</td>
</tr>
<tr>
<td>3.</td>
<td>Class 3</td>
<td>5</td>
<td>54.5</td>
</tr>
<tr>
<td>4.</td>
<td>Class 3B</td>
<td>4</td>
<td>36.4</td>
</tr>
<tr>
<td>5.</td>
<td>Kids</td>
<td>6</td>
<td>60.0</td>
</tr>
<tr>
<td>6.</td>
<td>VIP</td>
<td>4</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>20</td>
<td>34.4</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017
Based on Table 2, it can be seen that most of respondents are have good level of knowledge that are as many as 27 respondents (40.3%). Respondents who have good level of knowledge about medication error and drug delivery are in Class 2 room. While respondents who have poor knowledge level related to medication error and drug delivery are in Kids room.

Results of research about score of respondent’s knowledge on medication error and drug delivery that concluded based on each room are described in following table:

Based on Table 3, it can be seen that the room that has good level of knowledge is Class 2. There are two rooms that have fair level of knowledge, that are Class 1 and VIP. While there are three rooms that have poor level of knowledge that are Class 3, Class 3B and Class 2. This is indicates that most of rooms in Inpatient Unit of Surabaya Private Hospital have poor level of respondent’s knowledge about medication error and drug delivery.

Table 4 shows that Class 2 room is a room with no medication error during year of 2017. While in 5 other rooms there are incidences of medication error with a various number. It can be concluded that most of rooms in Inpatient Unit of Surabaya Private Hospital have medication error incidents during year of 2017.

Table 5: Cross tabulation between Respondent’s Knowledge on Medication Error and Drug Delivery with Medication Error Incidents at Inpatient Unit

Source: Primary Data, 2017
Based on Table 5, it can be seen that the whole rooms with poor level of respondents’ knowledge (100.0%) and the rooms with fair level of respondents’ knowledge (100.0%) are the rooms which medication errors are happened. The room with good level of respondents’ knowledge (100.0%) is the room which medication errors incidents are not happened. It can be concluded that the incidents of medication errors are more prevalent in the rooms with poor and fair level of respondents’ knowledge on medication errors and drugs delivery.

**DISCUSSION**

Knowledge is the result of “know” that has happened after someone held a sensing on particular objects mainly through the eyes and ears. If someone can answer questions shortly about particular fields fluently, both written and oral then it can be said that they knew some of these fields. A set of replied answers is called knowledge.

According to Hurlock in Jersild, *et al* (1978), 11 human life spans, that are prenatal (from conception to birth), neonatal period (born to 2 weeks), infancy (2 weeks-2 years), early childhood (2-6 years), late childhood (6-10/11 years), puberty (10-12/13 years), early adolescence (13/14-17 years), late adolescence (17-21 years), early adulthood (21-40 years), middle age (40-60 years) and old age (60 years and over). So the respondents in this study are included on early adulthood category.

The results of study indicate that most of respondents are have D-III educations. This means that respondents had fulfilled the requirements set in PERMENKES No.148/2010 on Nurse Practice Permit which stating that a nurse can doing nursing practices after obtaining Nurse Practice Permit and have minimum education of D-III on nursing.

Based on the results of study it is noted that most of respondent’s length of working is more than 10 years. The longer a person working, the more experience he or she has, so that he or she has the skills to work. This is in accordance with Prabandari (2003) stated that the longer a person’s length of working the higher the level of skill for the work that became his duty. The supports of adequate capability and experience will demonstrate the quality of his work.

Based on the results of study it can be seen that the nurse’s knowledge is still poor. Nurse’s knowledge is very important. Knowledge is influenced by several factors, one of them is a person’s education level. It can be said the higher level of person’s education the better level of knowledge. The higher level of person’s education, the easier one receives information and the more knowledgeable. If one’s knowledge is poor, it will hinder his performance because it is difficult to accept newly introduced information and values.

Comprehensive knowledge is very important for nurses. This is needed as the basis of any nursing action that was undertaken. If the nurse has adequate knowledge related to medication, then the nurses can take appropriate and safe medication to the patient. Likewise, the nurse’s knowledge related to medication error, the higher level of nurse’s knowledge then the identification of error in the service could be done before the error was happened to the patient.

The research conducted has the results that from 3 rooms that have poor level of nurse’s knowledge, the whole are rooms wherein medication error was happened. From 2 rooms that have fair level of nurse’s knowledge, the whole are also rooms wherein medication error was happened. This means that the incidence of medication error is more prevalent in a room with poor level of nurse’s knowledge.

Nurses with the poor knowledge will more often to make mistakes when performing health services. This is in line with the study conducted by Amik (2014) which explains that nurses with the better levels of knowledge, will make a few mistakes when taking medication and more able to identify errors before they happened to the patients. Another study that was in line with this study is study conducted by Budiharjo (2017) which states that the better the level of nurse’s knowledge the less the incidence of medication errors that happened in the room.

**CONCLUSION**

Based on the discussion it can be seen that the incidence of medication error was happened in the room of Inpatient Unit of Surabaya Private Hospital. In general, the nurse’s knowledge in the room of inpatient unit is still poor. Medication error was happened in a room with poor level of nurse’s knowledge and fair level of nurse’s knowledge.

**Ethical Clearance:** Taken from ethic committee of faculty of dentistry, Airlangga University.
Source of Funding: Self Funding

Conflict of Interest: There aren’t any relevant conflict of interest

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Association of Human Leukocyte Antigen-(HLA-B 27) Gene Polymorphism with Vitiligo Disease

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ABSTRACT

Vitiligo have been recorded in different ages in population it is appeared by interaction between different factors causes de-pigmentation in skin, the present study conducted to estimate HLA 27 gene polymorphism in vitiligo patients using single specific primer-polymerase chain reaction (PCR-SSP), DNA was extracted from whole blood for patients and control, then amplification was implemented, the results of demographic show that the means of age were 33.093 and 32.809 for patients and control, disease was recorded in female than male 79.54%, 18.18%, about 36.36% of patient had family history and 56.81% of them, their parents had family related. High percentage of patients had dispersive sites of de-pigment sites 54.54% while 40.90% of them in hands and legs. The genotyping results show that there was no association between HLA B27 and vitiligo disease, HLA – was 95.83% in patients while it was 85.71% in control in non-significant differences

This study concluded that there was no association between HLA B 27 and vitiligi disease in Iraqi population.

Keywords: vitiligo disease, of Human Leukocyte Antigen- (HLA- B 27), PCR-SSP.

Introduction

Vitiligo is an autoimmune disease resulted from melanocytes destruction which caused depigmentation in some part of skin and hair. The real cases of vitiligo have been studied, all reasons of vitiligo were based on the Loss of melanocytes function, However, some factors like autoimmune, genetic polymorphism and mutation,viral infections and oxidative stress may be contributed in vitiligo incidence and development. There were three theories for explaining the mechanisms of vitiligo pathology, the convergence theory is that stress, toxic compounds accumulation, autoimmunity, genetic mutations, changes in cellular environment and melanocyte migration and proliferation impaired have major role in varying features of vitiligo etiopathology.

Studies reported association between MHC class I region SNPs and vitiligo in the vicinity of the HLA-A gene found high-risk allele when they analysis DNA sequence encoding to canonical HLA-A2 specificity, which also present in variety of auto-antigens derived from melanocyte proteins like tyrosinase, TRP2, OCA2 and MART-1/melan-A.

Materials and Method

Study Design: Case-control study was carried out at the DNA lab/Babylon univ./in Babylon province/Iraq.

Study Population: The study subjects enrolled 44 patients suffer from vitiligo that diagnostic by specialist physician and these patients under biological therapy randomly selected from Karbala teaching hospital. All subjects in this study were taken written consent before participation in this study according to ethical approval of Iraqi ministry of health. Questionnaire taken from the patient included age, sex smoking habit, alcohol intake, and family history, past medical history.

Blood samples were collected in EDTA tube for DNA extraction, DNA was extracted from whole blood using (Genaid extraction kit) accoding to, After DNA extraction; consternation and purity of DNA
were estimated using nanodrpe. PCR conditions were performed as a following.

PCR Amplification single specific primer-polymerase chain reaction (PCR-SSP) using, a set of primers including (forward primer: 5F: 5'- GCTACGTGGACGACACGCT-3', R:5'-CTCGGTACGTCTGTGCTT -3'), R:5'-TCTCGGTAAAGTCCTGTGCTT A-3' (149 bp) and HgH as positive control F5'- TGCCTTCCCAACCATTCTTA-3'M (434bp) 10.

PCR conditions it performed as a following; per-denaturation for 5 min at 94˚C, then 35 cycles (60s at 94˚C, 2 min at 65˚C, 60 s at 72˚C, and finally 10 min at 72°C). PCR products were determined by electrophoresis pattern in agarose gel (1.5% agarose, 70 V, 20 mA for 45 min) with ethidium bromide staining, the results were statically analysis using X² and odd ratio at CI 95% And p value <0.05).

PCR Amplification single specific primer-polymerase chain reaction (PCR-SSP) using, a set of primers including (forward primer: 5F: 5'- GCTACGTGGACGACACGCT-3', R:5'-CTCGGTACGTCTGTGCTT -3'), R:5'-TCTCGGTAAAGTCCTGTGCTT A-3' (149 bp) and HgH as positive control F5'- TGCCTTCCCAACCATTCTTA-3'M (434bp) 10.

Results and Discussion

Vitiligo is depigmentation disorder disease caused by interaction of different factors, one of these is genetic polymorphisms and mutations, present study was conducted to detection HLA -27 gene polymorphism in vitiligo patients using PCR-ARMS technique. according to data that collected from patients and control the demographic the distribution of study groups show in table 1, there is no significant differences between patients and control in age mean (33.093 and 32.809) years at p value 0.928.

The prevalence of diseases in present study was in high in males than females, about 79.54% of samples were males several studies show that females were more frequent than males as in 11 for three years respectively in koria. In Indian 12, recorded that the ratio of females to males was 1.5:1, other study deal with present results that males more frequent than females 13,14, on the other hand there was equal incidence between male and female. This distribution depending on different factor like life style, genetic predisposition, genetic of gender, nutrition, and environmental factors.

Table 1: distribution of study subjects according age and sex

<table>
<thead>
<tr>
<th>Categories</th>
<th>Patients</th>
<th>Control</th>
<th>Statics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>33.093 ± 15.00</td>
<td>32.809 ± 15.066</td>
<td>t = 0.0894</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p= 0.9289</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td>Qi-square</td>
</tr>
<tr>
<td>Male</td>
<td>79.54%</td>
<td>80.95%</td>
<td>0.006, P = 0.938</td>
</tr>
<tr>
<td>Female</td>
<td>18.18%</td>
<td>19.04%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2, show chractisitc of patients, 36.36 % of patients had family history while 63.63 didn’t have family history, 16 mention in their study that vitiligo in the family history is caused by autosomal dominant inheritance. 17 clarified the relation between family history and children vitiligo, the earlier onset of pediatric vitiligo is linked to a family history. The information’s of family history of disease in Iraq was poor, especially genetic mutation and polymorphism in addition of other factor which contribution in disease incidence. In addition of family history about 56.81 % (table 2) of patinas their parents were related, this because culture of relative marriage in population.

Table 2: some features of vitiligo patients

<table>
<thead>
<tr>
<th>Categories</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family history</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>36.36</td>
</tr>
<tr>
<td>No</td>
<td>63.63</td>
</tr>
</tbody>
</table>

Table 2: some features of vitiligo patients

<table>
<thead>
<tr>
<th>Sites</th>
<th>Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispersive</td>
<td>54.54</td>
</tr>
<tr>
<td>Hands and legs</td>
<td>40.90</td>
</tr>
<tr>
<td>Abdomen</td>
<td>2.27</td>
</tr>
<tr>
<td>Face</td>
<td>2.27</td>
</tr>
</tbody>
</table>

Father and mother relation

| Yes | 56.81 |
| No  | 43.18 |

About 54.54% of patient had dispersive depigments area while 40.90 % of them the de-pigment area in terminal and 2.27 % in the abdomen and face 12 explained this phenomena that de-pigmentation occurs simultaneously or subsequently at various unrelated distant sites.
The results of DNA extraction was in figure (1, A) all of patients and control had high concentrated and pure DNA.

Figure 1: Electrophoresis pattern of A, DNA extracted from patient and control (70 V, 20 mA, 30 min, 0.5 X TBE buffer). B PCR- SSP products for of hela - 27 genotyping in patient and control. lane 1, 7 line and 8,15 HLA +.

Table 3 and figure (2, B) show results of HLA genotyping, HLA – was more frequent in patients 95.83% than control 85.71% while HLA + was high percentage in control 14.28% than patients 4.166%. these differences were non-significant at p value 0.2921, odd ration 0.265 (CI 0.0214 to 3.1778). A study implemented by 18 didn’t deal with present study, they improved association several HLA alleles like B 27 with vitiligo disease especially in familial history. the association of HLA alleles with vitiligo were diverse among population, B27 was associated with this disease in Italian population 19.

As a results of HLA alleles role in immune response against viral infected cells in serious pathways, it may be contributed in response to vitiligo caused by viral infection which improved by detected CMV in DNA of de-pigments cells 20,21.

Investigators consider HLA gene polymorphism as genetic marker of vitiligo disease and predisposition because of closed association between HLA alleles and disease incidence in different population 22,23 also the strongly linkage between HLA loci and other sites in the region of major histocompatibility complex (MHC) in chromosome 6p. 24,25.

Table 3: Genotype frequency in patents and control

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Patient</th>
<th>Control</th>
<th>Odd ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLA+</td>
<td>4.166%</td>
<td>14.28%</td>
<td>0.2609</td>
</tr>
<tr>
<td>HLA -</td>
<td>95.83%</td>
<td>85.71%</td>
<td>CI% 0.0214 to 3.1778 P = 0.2921</td>
</tr>
</tbody>
</table>

Conclusion

This study concluded that there was no association between HLAB 27 and vitiligo disease in Iraqi population.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Angiotensin Converting Enzyme Gene Polymorphism in Hypertension Patient Detection

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*College of Science, University of Babylon, Iraq; †Ibn Hayan University College, Kerbala, Iraq; ‡Al-Mustaqbal University College, Iraq; §Cultural Attache, Embassy of the Republic of Iraq, Amman, Jordan

ABSTRACT

Hypertension is one of the important health problems in last decade in Iraqi population, high percentage of its incidence have been reported in different ages, hypertension is blood pressure which effected by different factors. The pressure of the heart does not stay at the same level at all times. It varies based on activities at a particular point in time. The present study aims to estimate Angiotensin converting enzyme gene polymorphism with Hypertension disease in females, samples collected from females had age mean 25-70 years with duration period rang 1month-15 years and BMI mean 30.30. DNA was extracted from whole blood then PCR-ARMS used to detect Deletion/Insertion sequence, results show that non-significant differences between patients and control in age and BMI, there was 45.45 of patients were obese, 42.42 were overweight while 12.12 were normal weight. Patients had age range 35-55 was more frequent it was 58.62%, while age category <35 years was 12.06% and 29.31% of patient had age >55 years. Deletion insertion genotyping was non-significant differences between study groups in all genotype (p value 0.05) the frequents of DD genotype was same for patients and control in percentages 50 % with odd ratio 1. DI is more frequent in patients than control it was 25%, 22.22 % respectively with odd ratio 0.1 while genotype II was high in control 27.77% and in patients was 25%.

The present results concluded that no association between ACE gene polymorphism with Hypertension disease in female of Iraqi population

Keywords: Hypertension, Angiotensin converting enzyme, gene polymorphism. PCR-ARMS

Introduction

Hypertension has been the global problem which growing in the world it is correlated with some pathophysiological conditions (1) such as ventricular hypertrophy, dysfunction of endothelial, metabolic syndrome, chronic kidney disease, inflammation, oxidative stress and a genetic predisposition to cardiovascular events (2), in developing countries high prevalence of hypertension have been recorded which contributed in pandemic of cardiovascular disease (CVD) and renal failure (3,4). Multi factors have major roles in incidence hypertension like genetic and environmental factors which causes elevation of blood pressure, investigators used these factors in classification disease as a complex and multifactorial disease, other Factors like sedentary lifestyle, stress, diseases, smoking and alcohol intake also contributed in hypertension development (5-8).

Angiotensin Converting Enzyme (ACE) gene is located on chromosome 17q23 and consist of 25 introns and 26 exons, from 63,477,061 to 63,498,380 base pair (9). It is part of the renin-angiotensin system, which balance of salts and fluids in the body also it regulates blood pressure, By cleavage angiotensin I protein at a particular location, to converted it this protein to angiotensin II which causes constrict blood vessels to increased blood pressure (10). The insertion/deletion (I/D) polymorphism of ACE gene have been determined in the WBCs and tissue in addition to its levels in plasma and tissue(11,12).
Materials and Method

Case-control study was carried out at the DNA lab/Babylon univ./in Babylon province/Iraq.

The study subjects enrolled 55 females patients suffer from hypertension that diagnostic by specialist physician, these patients under biological therapy randomly selected from Mrjan teaching hospital. All subjects in this study were taken written consent before participation in this study according to ethical approval of Iraqi ministry of health. Questionnaire taken from patients included : BMI, age, occupation, past medical history.

Exclusion Criteria: pregnant women, smokers were excluded from present study.

Blood samples were collected for DNA extraction, its extracted from whole blood using (Genaid extraction kit) with modification according to (13), consternation and purity of DNA were estimated using nanodrpe. ARMS-PCR Amplification used for Angiotensin converting enzyme genotyping by set of primers including (forward primer : 5F: 5’-CCCATC CTT TCT CCC ATT TCT C-3’ R- 5’-GTT TTC ACC GTT TTA GCC GGG A-3’), R:5’-CCA TGC CCA TAA CAGGTC TTC A-3’ used to amplify the gene segment which produced 190bp (in deletion polymorphism) and 490bp (in insertion polymorphism) PCR conditions it performed as a following; per-denaturation for 5 min at 94˚C, then 35 cycles (30 s at 94˚C, 30 s at 67˚C, 30 s at 72˚C, and finally 10 min at 72˚C). PCR products were detected by electrophoresis pattern in agarose gel (1.5% agarose, 70 V, 20 mA for 45 min) with ethidium bromide staining, the results were statically analysis using $X^2$ and odd ratio at CI 95% And p value <0.05).

Results and Discussion

The results of present study that focused on polymorphism of angiotensin converting enzyme gene in hypertension patients show that patients ages mean was 49.0323 while control age mean was 46.3182 there was no significant differences between study groups. Body mass index in patients was higher than control group but in non-significant differences it were 30.3000 and 27.9545 respectively (table 1), figure 1 show distribution of patients according to BMI, obese patients were more frequent than overweight and normal BMI, the percentages were (42.42,45.45 And 12.12%) respectively, patients that had age range 35-55 was more frequent than other categories 58.62%, low percentage was found in the age category <35 years it was 12.06% while 29.31% of patient had age > 55 years, the Mozaffarian et al., (14) found that the prevalence of hypertension was increased with age. in other study which found a positive correlation between age and blood pressure for males and females (15). Also the same study improved that overweight/obese individuals were more likely to have hypertension than those with normal BMI. Vuvor et al., (16) concluded that increment in BMI was influenced blood pressure among adults’ population.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Patients</th>
<th>Control</th>
<th>Test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>30.3000 ± 5.46330</td>
<td>27.9545 ± 3.79583</td>
<td>t = 1.7360</td>
<td>0.0886</td>
</tr>
<tr>
<td>Age</td>
<td>49.0323 ± 10.51502</td>
<td>46.3182 ± 7.43471</td>
<td>t = 1.0599</td>
<td>0.2927</td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>55.31%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-10 years</td>
<td>31.91%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>12.76%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past Medical History</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthritis diseases</td>
<td>16.36%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>9.090%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>10.90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal diseases</td>
<td>3.63%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertetion</td>
<td>60%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Distribution of study subjects (hypertension vs control)
Figure 1: distribution of hypertension patients according to BMI categories, 1 overweight, 2 obese, 3 normal.

Figure 2: distribution patients according to age categories 1; <35 years, 2; 35-55, 3; >55 years

DNA for both patients and control groups show in figure (3-A) which extract from whole blood electrophoresis pattern show pure DNA with concentration rang 50-150 ng/µl. ACE gene polymorphism was detected using ARMS-PCR technique.

Figure 3: Electrophoresis pattern of DNA extraction from whole blood (A) and ACE genotyping using ARMS-PCR technique (B) 1% agarose, 70V, 20mA, for 60 min, lane M (100 bp) DNA marker, line 1,2,3,5,8,9 reefer to DI genotype, line 4 reefer to II Lane 7 refer to DD.

The results of ACE polymorphism show that the frequents of DD genotype was same for patients and control in percentages 50 % ($X^2 = 0.112$, $P$ value= 0.7373) and odd ratio 1. DI is more frequent in patients than control it was 25%, 22.22 % respectively with non-significant differences ($X^2 = 0.117$, $P$ value= 0.7320) odd ratio 0.1 while genotype II was high in control 27.77% and in patients was 25% in (table 2 and figure 3).

Table 2: Genotype distribution of ACE gene polymorphism for patients and control

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Patients%</th>
<th>Control%</th>
<th>Odd ration CI%</th>
<th>$X^2$</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD</td>
<td>50</td>
<td>50</td>
<td>1 0.3514 - 2.8458</td>
<td>0.112</td>
<td>0.7373</td>
</tr>
<tr>
<td>DI</td>
<td>25</td>
<td>22.22</td>
<td>0.8 0.1810 - 3.5364</td>
<td>0.117</td>
<td>0.7320</td>
</tr>
<tr>
<td>II</td>
<td>25</td>
<td>27.77</td>
<td>RG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>0.676</td>
<td>0.625</td>
<td>RG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>0.324</td>
<td>0.375</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The distribution of D and I alleles in patient and control were approximated. D was 0.625, 0.676 in patients and control respectively, allele I was 0.324 in patients and 0.375 in control group. This results show that no associated between ACE gene polymorphism with hypertension in females, a study deal with ACE gene polymorphism in Indian patient show that this gene correlated essential hypertension (17). He et al. (18) found that the ACE polymorphism was significant associated with hypertension, while expression level didn’t important factors associated with hypertension in this Chinese population. Rasyid et al., (19) deal with present results that no significant difference in genotype distribution and allele frequency between study groups. Present study need more investigation about other factors which effected in hypertension incidence in Iraqi population, like life style, other genes polymorphism, and genetic predispositions in Iraqi individuals.

**Conclusion**

The present results concluded that no association between ACE gene polymorphism with Hypertension disease in female of Iraqi population.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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The Incidence of Breast Cancer in Women with Thyroid Dysfunction in Al-Najaf Province

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ABSTRACT

The problem of B.C. is growing in both established and developing states, and in many provinces of the domain, it is the utmost frequently arising malignant sickness in females; it is including (18 percent) from the all cancers that effected woman, and the global, B.C. is the 5th greatest public cause of death with cancer. In year (2008), almost (1.4) m. female were established with B.C.in universal with a consistent about (460.000) demises.

Thirty Participants were included in this study; they were attendants of Al-Sadder Medical City, breast cancer unit and Middle Euphrates Cancer Center in AL- Najaf province.

The results of the present study revealed positive family history of breast cancer in 60% of malignant cases, while negative cases comprise 40 %. In benign cases; positive family history was less frequent comprises only (26%) while negative cases was of higher frequency (73%), and such difference was highly significant (P < 0.05).

A.B.O. blood group phenotypes in B.C. female patients in both type malignant, and benign and healthy woman (married, single and infertile women) revealed no insignificant alteration, where as an improved incidence of blood group phenotype B (64%), and a decreased frequency of blood group AB (10%) in evil (malignant) unhealthy person as matched with healthy assemblies, infertile, solitary, wedded (30%, 30%, 22% independently), and however an improved frequency of blood group O (43%) and a decreased frequency of blood group A (13%) in benign patients as compared with control groups infertile, solitary, married.

The present research advocated an elevation occurrence of goiter synchronized with extraordinary frequency of autoimmune thyroiditis, established mainly by A.b. positivity, in woman breast cancer persons. Hyperthyroidism was found in high percentage 6 cases (20%) in malignant breast cancer and 4 cases (10%) in benign cases when compared with control group 1 (4.0%), (P<0.05). The present study revealed high percentage of hypothyroidism, Nontoxic goiter was found in 20 patients in malignant breast cancer group (67 %) and 23 in benign breast cancer patients (77 %) controls 6 (96 %) and such difference was highly significant (P < 0.05).

Keywords: Breast cancer, thyroid, Najaf

Introduction

Breast cancer is a collection of cells that proliferated abnormally and formed a lump in the breast area, and is characterized by it’s ability of cancer cells to spread from one place to another and this means that if they left and not treated as soon as may lead to the spread of the disease in the body and then death (1).

Breast cancer utmost commonly arising of disease within malignant woman; comprising about eighteen
percent of all female cancers, and worldwide, breast cancer is the 5th most communal cause of cancer death, the encumbrance of B.C. is increment in established and evolving states, and in a various regions of the world \(^{(2)}\). In the year of 2008, approximately (1.4) M. of female were established with B.C. Worldwide with corresponding of (460.000) death \(^{(3)}\).

Cancer of breast in woman patients are the public phenotype of woman carcinoma, secretarial for about (1: 3) of the recorded female cancer consistent with the modern Iraq C.R. (Iraqi -Malignant tumor- Documentation)/(2010) \(^{(4)}\), and the supplementary causes of tumor interrelated demises \(^{(5)}\). In our countries according to Ministry of health/Iraq- Cancer archive (2006), of B.C. was most often cancer among women also it was the commonest in Kirkuk city. It forms (15-32 %) of total cancer patients with severe rise in occurrence of this tumor type in youngest age person, typical year old of person with breast-carcinoma in Iraqi female is (45) y.\(^{(6)}\).

There are unknown reasons etiological issue of tumors type had been advocated with epidemiological, also dissimilar B.C. -associated harmful influences have been recommended by the studies of epidemiological; for example, period, menstruation, equality, woman with menopause, breast-feeding by using of exo-genous hormones or oral contraceptive, fatness, lack of the employment, nourishment, smoldering, whisky, malt ingestion and family history of B.C. or other tumors \(^{(7)}\), these may be risk issues have been publicized to have different relatives to tumor of breast in different national populaces of the biosphere \(^{(8)}\).

Binding or rejection of the natural levels of hormones in the body accountable for the preservation of homeostasis of the body and the instruction of metabolic process of developmental, and may consequence in the demonstration of tumor in breast tissue of woman \(^{(9,10)}\).

Genetic anomalies in breast tumor have been obstructed concluded a different of the genomic lines also, one of them is genomic unpredictability evaluated. Genomic uncertainty in cancer can be observed as instability of chromosomal, and in which a popular of the cancers revealed the irregular karyotype including both rearrangement of chromosome and, or aneuploidy and are categorized as tumors. In this respect, different research stated an irrelevant increase in chromosomal aberrations (C.A.s) in cultured (P.B.L.s) of cancer patients with solid cancers \(^{11,12}\).

### Materials and Method

**Patients:** Our study convoluted about (ninety) of women patients, also dispersed into two type of groups of unhealthy groups of person and three groups of healthy person. unhealthy woman who had a breast tumor, and permitting to the tumor type and they dispersed as malignant and benign assemblies, and each group contain about (thirty) of woman patients. Malignant tumor group comprised patients with age range: (25 and 70 y.), though such variety in benign tumor groups were (20- 65 y).

Patients of Breast Tumor at center of tumor in AL-Furat Al-Awsat and Al-Sader Teaching Hospital (Najaf) during the period (March 2017 to February 2018). Three groups of women were registered in our previous research, included married woman, also had children, (Married woman group), married woman but with problem of primary infertility (Infertile group) and single women (Single group); each with (ten) subjects.

**Blood Sample:** The study enrolled by collection of 10ml of venous blood from each case using disposable syringe under aseptic conditions and divided into three aliquots; 2 of them with 4 ml. They were distributed in tube, and let for fifty min., formerly, they were putting in centrifuge at 3000rpm, for 10min. for serum collection. The third part of blood about 1.5- 2 ml in EDTA tube for hematological tests.

**Blood Phenotype:** About 1.5- 2ml of blood used, this way based on the method of agglutination reactions in the groups of blood with particular antiserum from company (Bio-test-Germany).

**Thyroid Function Test:** Serum T3, T4 and TSH was determined by using the extracted serum from the 1st 4 ml of blood and analyzed by ELISA equipment, it is provided by alpeco-analytic, United State of America\(^{(13)}\).

**Determination of T.P.O.:** The test of T.P.O. by using the ELISA kit is a semi-quantifiable of enzyme-interrelated immune-osorbent analyze that used for the exposure of antithyroid peroxidase Ab in the serum of human in both groups.

**Bio-statistical Analysis:** Mean ± standard deviation were used. One way analysis of variance (ANOVA) monitored by least significant difference, analyses at (0.05%) probability of levels was used, the difference will be major when (P <0.05) value \(^{(14)}\).
Results

The History of families for our study are listed in table (1).

Table 1: History of family with breast cancer (Significant (P.<0.05)

<table>
<thead>
<tr>
<th>History of families</th>
<th>Benign</th>
<th>B. C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>18</td>
<td>60.0</td>
</tr>
<tr>
<td>Negative</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2 shows the dispersion of breast cancer throughout the blood phenotypes

Table 2: Percentage incidences of phenotype of blood group in breast tumor woman patients and controls

<table>
<thead>
<tr>
<th>Phenotype of blood groups</th>
<th>Malignant No.</th>
<th>Benign No.</th>
<th>Control No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>9</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>14</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>AB</td>
<td>3</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>O</td>
<td>4</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 3 shows thyroid function within all subjects of our study

Table 3: Classification of woman patients according to the thyroid function

<table>
<thead>
<tr>
<th>Thyroid disorder</th>
<th>Malignant No.</th>
<th>Benign No.</th>
<th>Control No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperthyroid</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Hypothyroid</td>
<td>4</td>
<td>4</td>
<td>–</td>
</tr>
<tr>
<td>Non-toxic goiter</td>
<td>20</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
<td>7</td>
</tr>
</tbody>
</table>

The results in figure (1) revealed increase of levels of T3 in malignant and benign cancer according to age of breast cancer patients when equaled with healthy persons such dissimilarity were extremely substantial (P < 0.05).

Figure 1: T3 levels in benign and malignant breast cancer women patients according to age

The results in figure (2) showed comparison between benign and malignant breast cancer cases according to levels of T3, the difference was highly significant (P < 0.05) when compared with healthy woman.
Results that showed in the figure (3) revealed levels of T4 in benign and malignant cancer according to age of patients with B.C, the difference significantly was highly (P < 0.05) when compared with control group.

The results in figure (4) showed comparison between benign and malignant in breast cancer woman patients according to levels of T4, the difference was highly significant (P < 0.05) when compared with healthy woman.

The results of present study in figure (5) revealed levels of TSH in benign and malignant cancer according to age of patients with B.C, the difference significantly was very highly (P < 0.05) when compared with control group.
The results in figure (6) showed comparison between benign and malignant breast cancer woman patients according to levels of TSH such difference was highly significant (P < 0.05) when compared with healthy women (control group).

The results revealed levels of anti-thyroid peroxidase in benign and malignant cancer according to age of patients with B.C., the variance was highly significant (P < 0.05) when compared with control group.

The results comparison between benign and malignant breast cancer woman patients according to thyroid peroxidase. The variance was highly significant (P < 0.05) when compared with control group.

**Discussion**

Aggregation of familial incidence can be recognized both to segment the mental surroundings, genes, and lives, and it consumes been confirmed the hazard of the breast cancer developments was twofold such as highly percent in the female with an precious relative of first - degree than, female in common inhabitants (15). The modest of the risk vulnerability alleles, it is conversing small percent of the danger in sequestration, but have reasonably a insignificant consequence with combination (16).

The reason behinds such not significantly differences, also may be interrelated to small size of control samples. The significantly differences were generally paid with an increased the incidence of the
phenotype of B blood group for patients with malignant, O phenotype of patients with benign (64% vs. 43%), also a reduced the occurrence of the phenotype AB of patients with malignant, and phenotype A of blood group of patients with benign (10% vs. 13%) in the B.C. this study has been agreement with current research that obtained by (17-19).

Dissimilarities of the geography in the occurrence of B.C. have been accredited to alterations in the iodine intake with diet, and a consequence of the iodine on the breast has been assumed (20,21). The receptors on the tumors of breast, have been assumed for accountable for the accident of thyroid gland complaints and mammary (22).

Conceivable of the relations between the tissue of thyroid gland and tissue of the breast are centered on the public property of the epithelial cell of thyroid gland and mammary to quintessence of iodine by the mechanism of active transport across cell membrane of tissue, in addition to on the occurrence of the receptors TSH in adipose tissue, that is rich in mammary gland (23, 24).

Modern study that recommended well prediction for B.C. with patients and improved the ranks of hormone (T.P.O.) (22). That suggested the response of immune system might be focused both by tumor and by thyroid tissue. The high percent of (T.P.O.) levels has been revealed to be a very significant factor in Ab-reliant cell cyto-toxicity in the tissue of thyroid gland, and may be a conceivable relationship between the immune system, and autoimmune thyroiditis this revealed no arrangement on the significance of its suggestion with woman with cancer type of breast in woman (25).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Comparison between the Effectiveness of Combination of Letrozole with Misoprostol and Tamoxifen with Misoprostol in Medical Termination of First Trimester Missed Miscarriage

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¹College of Medicine, University of Tikrit, Salah Al-Deen, Iraq

ABSTRACT

The missed miscarriage was similarly named as silent miscarriage. The aimed of this study was to compare the efficacy between letrozole with misoprostol and tamoxifen with misoprostol for medical termination of first trimester missed miscarriage. The study was conducted as a randomized comparative trial from January 2015 to November 2015 at Tuzkhurmatu general hospital in Salah Al-Deen government (Iraq). A total of 120 women with missed miscarriage at (6-13 weeks) gestation were randomly divided in to two groups: (60 women) were received 7.5 mg of letrozole orally for two days, and (60 women) were received 60 mg of tamoxifen for two days. After two days 600 misoprostol administrated vaginally in all women, if they had no vaginal bleeding a second dose of 800 misoprostol was given after 24 hours. The results shown that many woman prefer a less invasive way of terminating their pregnancy in case of missed abortion (and legal medical abortion), and also wish to be awake during the treatment despite the fact that they might experience more pain and longer bleeding compared with woman undergoing primary surgical evacuation and over (25%) of medically treated women undergo secondary surgical evacuation.

Keywords: Miscarriage, letrozole, Tamoxifen.

Introduction

The missed miscarriage was similarly named as silent miscarriage. The good purposes of you won’t knowledge the normal alert of hampering or hemorrhage, however particular indications, such as the sensitive breasts or biliousness, may start facilitation up. A missed miscarriage is a gestational sac containing dead embryo or fetus before 24 weeks gestations without clinical symptoms of expulsion (¹). The missed miscarriage was a reason of apprehension both for the patients and the gynecologist. The gynecologist worry was determining the technique of concluding pregnancy. The difficulty was as of locked cervix, bulk of creation and the opportunity of devotion of produces to the uterine partition. This devotion enlarges Hazard of incomplete removal and uterine (²). Over the historical from three eras, medical approaches of abortion had been advanced during the world, medical abortion that were include the use of medications to stimulate an abortion, while the technique was most frequently used up to 63 days of development (estimated from the first day of the last menstrual dated), the management also operative after 63 days of gestation puncture (³).

Mifepristone is synthetic anti-progesterone; Mifepristone have been displayed to be an operative abortifacient after when collective by a prostaglandin administrated two days later (⁴). Misoprostol is a synthetic analogue of prostaglandin; it has been found that the oral pill can be used in promoting cervical ripening and uterine contraction (⁵). Methotrexate is a folic acid antagonist it has been used in combination with misoprostol for early abortion up to (⁷) weeks in some countries when mifepristone has not been available (⁶).

Tamoxifen is selective estrogen receptor modulator used in treatment and prevention of breast cancer. Ingestion of tamoxifen followed by misoprostol would be

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an effective medical method of termination of pregnancy (7). Letrozole is non-steroidal aromatase inhibitor may be another effective option for medical abortion but more research is need regarding this regimen (8).

The management of abortion is an important issue in gynecology. Medical abortion has been considered as a non-invasive option for first trimester pregnancy termination as it avoids the risk of anesthesia and surgical trauma to the cervix and uterus and other organs. The aim of this study was to compare the efficacy between letrozole with misoprostol and tamoxifen with misoprostol for medical termination of first trimester missed miscarriage.

The study was conducted as a randomized comparative trial from January 2015 to November 2015 at Tuzkurmatu general hospital in Salah Al-Deen government (Iraq).

Materials and Method

A total of 120 women with missed miscarriage at (6-13 weeks) gestation were randomly divided in to two groups: (60 women) were received 7.5 mg of letrozole orally for two days, and (60 women) were received 60 mg of tamoxifen for two days. After two days 600 misoprostol administrated vaginally in all women, if they had no vaginal bleeding a second dose of 800 misoprostol was given after 24 hours. The main outcome measure was the complete abortion rate. The secondary outcome measures included complete abortion rate according to misoprostol the records were then analyzed by the use of SPSS version 22.

Inclusion Criteria:

1. Age older than legal consent>18 years.
2. Primigravida or multigravida.
3. Missed miscarriage (6-13weeks)
5. No history of chronic diseases
6. Closed cervical OS.

Exclusion Criteria:

1. Woman age less than 18 years.
2. Gestational age more than 13 weeks.
3. Intrauterine contraceptive device.
4. History of vaginal bleeding or abdominal pain.
5. Breast feeding.
6. Hemoglobin level less than 10 g/dl, abnormal coagulation screen, abnormal liver or renal function test, viral hepatitis positive.
7. Allergy to misoprostol, letrozole, tamoxifen.
8. History or evidence of disorders that represent contraindication to the use of letrozole, tamoxifen, misoprostol.
9. Ovarian or uterine pathology.
11. Any evidence of infection.
12. Patient’s refusal to participate in the study.

All women had uneventful history with normal general examination. Gynecological examination revealed enlarged uterus, with no vaginal bleeding, and no dilatation of cervical OS. Investigation included blood group and Rhesus factor, complete blood count, random blood sugar, general urine examination, hepatitis screen, liver and renal function test, and blood coagulation profile. The diagnosis of missed miscarriage and the gestational age was confirmed by a reliable menstrual history and ultrasound examination. Total of hundred twenty women had met the selection criteria randomly divided in to two groups:

i. Letrozole groups (60 women) were given letrozole 7.5mg as an oral dose (three tablets of 2.5 mg, FemaraR, NOVARTIS) for two days.

ii. Tamoxifen groups (60 women) were given tamoxifen 60mg as an oral dose (three tablets of 20mg, AstraZeneca Company, UK) for two days.

Results and Discussion

A total of (120) women presented with missed miscarriage (6-13) weeks gestational age were enrolled. 60 women were allocated for medical termination of their pregnancies with letrozole and misoprostol and the others 60 women with tamoxifen and misoprostol as shown in Table 1.
Table 1: Characteristics of women in both study groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Number and percentage of Women</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Letrozole with misoprostol</td>
<td></td>
</tr>
<tr>
<td></td>
<td>group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tamoxifen with misoprostol</td>
<td></td>
</tr>
<tr>
<td></td>
<td>group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p value</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 25</td>
<td>17 (28%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 (35%)</td>
<td></td>
</tr>
<tr>
<td>26 – 31</td>
<td>21 (35%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 (33.3%)</td>
<td></td>
</tr>
<tr>
<td>32 – 37</td>
<td>14 (23.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 (16.6%)</td>
<td></td>
</tr>
<tr>
<td>38 -43</td>
<td>8 (13.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 (15%)</td>
<td>NS*</td>
</tr>
<tr>
<td>Gestational Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 – 9</td>
<td>54 (90 %)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>52 (86.6%)</td>
<td></td>
</tr>
<tr>
<td>10 -12</td>
<td>6 (10%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 (13.3%)</td>
<td>NS*</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravida</td>
<td>7 (11.6%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 (16.6%)</td>
<td>NS*</td>
</tr>
<tr>
<td>Multigravida</td>
<td>53 (88.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 (83.3%)</td>
<td></td>
</tr>
<tr>
<td>Previous Abortion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>33 (55%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28 (46.6%)</td>
<td>NS*</td>
</tr>
<tr>
<td>previous C/S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>7 (11.6%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 (13.3%)</td>
<td>NS*</td>
</tr>
</tbody>
</table>

(NS= No statistical significance)

The numbers of women with age between (20-25 years) in letrozole group were 17(28.3 %), and in tamoxifen group were 21(35%), age between (26-31years) in letrozole group were 21 (35%) women, and in tamoxifen group were 20 (33.3%) women, age between (32-37 years) in letrozole group were 14 (23.3%) women, and in tamoxifen group were 10 (16.6%) women, age between (38-43years) in letrozole group were 8 (13.3%) women, and in tamoxifen group were 9 (15%) women. P value for all above results was more than (0.05), which was statistically not significant.

The number of women with gestational age between (6-9weeks) in letrozole group were 54 (90%) women, and in tamoxifen group were 52 (86.6%)women, gestational age between (10-12 weeks) in letrozole group was 6 (10%) women, and in tamoxifen group were 8 (13.3%) women. P value was more than (0.05), which was statistically not significant. The numbers of primigravida in letrozole group were 7 (11.6 %), and in tamoxifen group were 10(16.6%), the numbers of multigravida in letrozole group were 53(88.3%), and in tamoxifen group were 50 (83.3%), with no statistical significance between two groups.

In letrozole group the numbers of women with previous abortions were 33 (55%) and in tamoxifen group were 28 (46.6%) and the number of women with previous C/S in letrozole group were 7(11.6%), and in tamoxifen group were 8(13.3%). p ≤ (0.05), which was statistically not significant.

As shown in Table 2, 40 women were aborted completely in the Letrozole group given a complete abortion rate of (66.6%), compared to 53 women in tamoxifen group given a complete abortion rate of (88.3%). 12(20%) women were aborted incompletely in the letrozole group, compared to 5(8.3%)women in the tamoxifen group. 8(13.3%)women were failed to abort in letrozole group, compared to 2(3.3%) women in tamoxifen group, these results were statistically significant.

Table 2: outcome of treatment

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Numbers and percentage of women</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Letrozole group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tamoxifen group</td>
<td></td>
</tr>
<tr>
<td>complete Abortion</td>
<td>40(66.6%)</td>
<td>53(88.3%)</td>
</tr>
<tr>
<td>Incomplete Abortion</td>
<td>12 (20%)</td>
<td>5 (8.3%)</td>
</tr>
<tr>
<td>Failure</td>
<td>8 (13.3%)</td>
<td>2 (3.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

(S= statistical significance)

As shown in Table 3, 5(8.3%) women of tamoxifen group were aborted before the administration of misoprostol, while in letrozole group no women were aborted before misoprostol administration. 11(27.5%) women in letrozole group were aborted completely after first dose of misoprostol, compared to 35 (66%) women in tamoxifen group, and 29 (72.5%) women of letrozole group were aborted after the second dose of misoprostol, compared to 13 (24.5%) women in tamoxifen group, all these results were statistically significant, p value less than (0.05).
Table 3: Complete abortion according to misoprostol administration

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Letrozole group</th>
<th>Tamoxifen group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before misoprostol administration</td>
<td>-</td>
<td>5</td>
<td>S*</td>
</tr>
<tr>
<td>After 1st dose of misoprostol</td>
<td>11(27.5%)</td>
<td>35(66%)</td>
<td></td>
</tr>
<tr>
<td>After 2nd dose of misoprostol</td>
<td>29(72.5%)</td>
<td>13(24.5%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>53</td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 4, in women between age of (20-25 years), complete abortion was occurred in (76.4%) 13 out of 17 women in letrozole group, compared to (90.4%) 19 out of 21 women in tamoxifen group, women between age of (26-31 years), complete abortion was occurred in (52.3%) 11 out of 21 women in letrozole group, and (85%) 17 out of 20 women in tamoxifen group. Women between age of (32-37 years), complete abortion was occurred in (71.4%) 10 out of 14 women in letrozole group, compared to (90%) 9 out of 10 Women in tamoxifen group. Women between age of (38-43 years), complete abortion was occurred in (75%) 6 out of 8 women in letrozole group, while in (88.8%) 8 out of 9 women in tamoxifen, all these results were statistically significance, p value less than (0.05).

Table 4: complete abortion according to women age

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Letrozole with misoprostol group</th>
<th>Tamoxifen with misoprostol group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total number</td>
<td>Number percentage of women with complete abortion</td>
<td>Total number</td>
</tr>
<tr>
<td>20-25</td>
<td>17</td>
<td>13(76.4%)</td>
<td>21</td>
</tr>
<tr>
<td>26-31</td>
<td>21</td>
<td>11(52.3%)</td>
<td>20</td>
</tr>
<tr>
<td>32-37</td>
<td>14</td>
<td>10(71.4%)</td>
<td>10</td>
</tr>
<tr>
<td>38-43</td>
<td>8</td>
<td>6(75%)</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>

There are three reasons for searching for a medical alternative:

First that many woman prefer a less invasive way of terminating their pregnancy in case of missed abortion (and legal medical abortion), and also wish to be awake during the treatment despite the fact that they might experience more pain and longer bleeding compared with woman undergoing primary surgical evacuation.

Second, even though approximately (25%) of medically treated women undergo secondary surgical evacuation, they may still have a lower infection risk as compared to woman primarily undergoing surgical evacuation.

Third, the waiting time for the operating theatre may sometimes be days, whereas medical treatment may be initiated immediately after diagnosis.

Several clinical trials have evaluated the use of misoprostol alone for termination of early pregnancy failure, highest abortion rate was found in a study done at 2007 by Hertzen et al, who found that complete abortion rate was (84-87 %) up to 63 days gestation after administration of 800mg of misoprostol vaginally or sublingually every three hours for three doses. However in combination of misoprostol with others drugs was more effective (9).

The main outcome from this study was the complete abortion rate which is (88.33%) in combination of tamoxifen with misoprostol compared to (6.66%) in combination of letrozole with misoprostol, which is statistically significant.

The results of the present study demonstrated that complete abortion rate in letrozole group was 66.66% which is lower than previous mentioned studies, these variation may explain by difference in numbers of women, gestational age, period of letrozole management, and dissimilar amounts of it. All 5 patients (8.33%) in tamoxifen collection were terminated totally before the management of misoprostol. The whole abortion ratio afterward chief dose of misoprostol in tamoxifen collection were meaningfully upper than letrozole group, that were (58.31%) and (18.31%), correspondingly.

The changes of hemoglobin from baseline to one month after induction of abortion were (0.558 + 0.308)
in letrozole group and (0.432 + 0.248) in tamoxifen group, which indicate it has no much more blood loss in both groups. This agrees with study done by (10), who found that the median decrease in hemoglobin level was 0.50 g/dl (+2.2 to -4.7 g/dl).

**Conclusion**

We conclude that tamoxifen and misoprostol is more effective than letrozole with misoprostol as a medical method of termination for first trimester missed abortion, it is associating with higher complete abortion rate after single misoprostol dose and with gestational age up toward 11 weeks. We mention that the assistance of tamoxifen with misoprostol in health dissolution of chief trimester missed abortion.

The conflict of interest was summaries in failure of the sample in terms of number and geographical distribution, where the study on the number of 120 women, and in the area of Tuzkhurmatu only.

The ethical was asked patients to own an eleven minutes rest before measure of their pressure level of blood. Ethics Committee of Tuzkhurmatu general hospital in Salah Al-Deen government (Iraq) and AHAPs permitted the analysis method, and printed consent were attained from all of the members before beginning of the study.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Serological Detection of Hepatitis B Virus by Rapid Test Compared to Elisa in Kerbala Province, Iraq

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ABSTRACT
There are more than 240 million Hepatitis B virus (HBV) carrier cases and more than 600,000 deaths annually worldwide. Hepatitis B may cause acute hepatitis (AHB) or chronic hepatitis (CHB). Patients with CHB have elevated complications involving cirrhosis and liver cells carcinoma.

This study aim to detect HBV in Kerbala province by ELISA and Rapid test.

All samples were taken from outpatients attending Imam Hussein Medical City Hospital, Kerbala Province and Central Public Health Laboratories, Kerbala Province, Iraq, during the period from October 2017 through April 2018. Total of 50 HBV suspect patients were subjected to ELISA (Bioelisa HBsAg Kit, Spain) and then retested by HBsAg Rapid Test Cassette (OnSite HBsAg Rapid Test Cassette, USA). The number of females was (23) and the number of males was (27). The age groups ranged from (16-70) years.

All samples were showed positive results by ELISA and by Rapid test.

Rapid test proved to be fast, reliable and economic test for HBsAg detection in routine HBV investigation tests.

Keywords: Hepatitis B virus, ELISA, rapid test, HBsAg.

Introduction
One of the major global health problems is Hepatitis B virus (HBV). More than two billion people are infected where more than 240 million Hepatitis B virus (HBV) carrier cases and more than 600,000 deaths, with liver cirrhosis and hepatocellular carcinoma, annually worldwide (1-3). Hepatitis B may cause acute hepatitis (AHB) or chronic hepatitis (CHB) (4). HBV incubation period is about 75 days on average, but can up to 180 days (5). HBV can be detected by serological methods like ELISA and rapid test as the most common, fast and economic methods to detect different virus markers such as HBsAg, anti-HBsAg, anti-HBcAg, HBeAg and anti-HBeAg (5,6).

ELISA is a biochemical assay that uses antibodies and an enzyme-mediated color change to detect the presence of antigen with high sensitivity (7).

Rapid diagnostic test (RT) strip is a lateral flow chromatographic immunoassay where HBsAg can be detected. The immune-complex is captured on a membrane by the pre-coated non-conjugated HBsAg antibody (6). RT have several advantages, it is easy to perform, fast, economic and can be done on a case-by-case (9,10).

This study was conducted since the presence of HBsAg in serum or plasma is the most important indicator for the diagnosis of a hepatitis B virus (HBV) infection.

Materials and Method
Study Subject: A total of 50 HBV suspected patients, 27 males and 23 females aged from 16-70 years. They were outpatients attending Imam Hussein Medical City Hospital, Kerbala Province and Central Public Health
Laboratories, Kerbala Province, Iraq, during the period from October 2017 through April 2018. They were pre-operation, routine marriage test or pregnant women cases.

**Specimen Collection and Processing:** Total of 50 intravenous blood samples (5ml) were collected. The blood sample was poured into a clean tube without anticoagulant and centrifuged at 3000xg for 5 minutes. The serum was stored in clean tubes at (-20°C) until use.

**Detection of HBsAg**

**ELISA screening test:** Samples were approved infected with HBV by ELISA (Bioelisa HBsAg Kit, Spain) at Imam Hussein Medical City Hospital and Central Public Health Laboratories, Kerbala Province. This test is based on a one-step “Sandwich” principle. In brief, HBsAg coupled with horseradish peroxides (HRP) serves as the conjugate, Tetramethyl Benzedrine (TMB) and peroxide as a substrate. Upon completion of the test, a color develops which is directly proportional to the amount of HBsAg in the sample. The method done according to the manufacturer recommendations. Blank was read at 450nm and the absorbance was read, of each well, within 30min. It is recommended to read using a 620-630nm reference filter.

**HBV Rapid Test:** All samples were tested using HBsAg Rapid Test-Cassette (OnSite HBsAg Rapid Test Cassette/ USA) for qualitative detection of HBsAg at a ≥1ng/mL.

About 200μL of serum was transferred to the specimen well then started the timer for 15min.

The results were read according to the manufacturer’s instructions. The positive result is with two colored lines appeared, one in the control region (C) and the other in the test region (T). The negative result, one colored line should appear in the region (C) only.

**Results**

**Distribution of HBsAg positive patients:** Total of 50 patients were distributed according to their gender and according to their age. When distributed according to their gender founded that males were more than females with a ratio of (1.17:1) and percentage of 54% males and 46% females (figure 1).

**Distribution of HBsAg positive patients according to gender**

**Distribution of HBsAg positive patients according to age:** When distributed HBsAg-positive patients according to their age (table 1), were found that the age ranged between 16-70 year with a mean age (40.16), and found that most of the patients were located within fifth and sixth decade 51-60 year with a percentage of 34%.

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>21-30</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>31-40</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>41-50</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>51-60</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>61-70</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**ELISA and rapid tests:** The result of ELISA showed the presence of HBsAg in all patients’ serum. Moreover the result of HBsAg Rapid Test were showed all samples were positive too and the results showed some patients had weak positive result where other patients had strong positive result (Figure 2).
Discussion

Since HBsAg appear the first during acute HBV infection, HBsAg is the most critical serological marker to detect and remains detectable upto six months (11,12). So that we used two methods to detect HBsAg in patients, the first method by ELISA and the second by rapid test the results were compatible using both methods. Although ELISA is 10 times more sensitive (0.15 ng/ml), the result of HBsAg Rapid test showed some specimens had weak positive result where other specimens had strong positive result (see figure 1). The specimens had weak positives result because they are from patients in early stages of infection or inactive carriers (13-16), and the level of HBsAg in serum ≥1ng/mL. While the specimens, which showed strong positive result had HBsAg in serum higher than 1ng/mL.

Conclusion

Despite its less sensitivity, Rapid test is fast, reliable, economic test with much less effort and instrument usage for HBsAg routine investigation and HBV detection on a case-by-case basis.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors have no conflict of interest.

Source of Funding: Self-funding

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Prognostic Evaluation of $KRAS$ Gene Mutation in Colorectal Cancer Patients

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$^1$University of Al-Qadisiyah, IRAQ

ABSTRACT

Background: Colorectal cancer is the most common malignant tumor of the lower gastrointestinal tract (colon and rectum) of epithelial origin, perhaps the only cancer that starts as a benign adenomatous polyp, which can last a few years to become cancer. The RAS gene family is among the most studied and best characterized of the known cancer-related genes. Of the three human ras isoforms, KRAS is the most frequently altered gene with mutations occurring in 17%–25% of all cancers. The aim of current study was to develop a highly sensitive method for detecting somatic mutations of KRAS gene for genotyping CRC patients.

Method: The present investigation included 20 control group and 40 patients with Colorectal Cancer with ages between (26–82 years) for the identification of KRAS gene by symmetric PCR technique (RT-PCR). The risk of mutant KRAS genotype in association with colorectal cancer was assessed in terms of Odds ratio.

Results: Current study showed that persons harboring mutant KRAS genotypes are at two-fold risk for developing colorectal carcinoma than the general population.

Conclusions: On the basis of current study findings, significant over productions of KRAS mutations seemed to have potential role in colorectal cancer progression and worse prognosis when compared with healthy people.

Keywords: Colorectal Cancer, KRAS gene, genotyping, mutations, prognosis.

Introduction

Colorectal cancer is the most common malignant tumor of the lower gastrointestinal tract (colon and rectum) of epithelial origin, perhaps the only cancer that starts as a benign adenomatous polyp, which can last a few years to become cancer. Colorectal carcinoma considered the fourth most common malignancy affecting gastrointestinal tract (1). The RAS gene family is among the most studied and best characterized of the known cancer-related genes. Of the three human ras isoforms, KRAS is the most frequently altered gene with mutations occurring in 17%–25% of all cancers. Approximately 30%–40% of colon cancers carry a KRAS mutations. The latter have been associated with poor survival and increased tumor aggressiveness. Additionally, KRAS mutations in colorectal cancer lead to resistance to selected treatment strategies. The detection of KRAS mutations has been associated with decreased response rates to selected chemotherapeutic agents. Therefore, KRAS mutational status is a critical factor when considering the use of targeted therapies. The association of KRAS gene mutation and response to therapy was first reported in patients with metastatic colorectal cancer, who were treated with anti-epidermal growth factor receptor (EGFR) agents. The link between the KRAS gene mutation and decreased response to anti-EGFR agent was first reported by (2). The KRAS oncogene is mutated in approximately 35%-45% of colorectal cancers and KRAS mutational status testing has been highlighted in recent years. The most frequent mutations in this gene, point substitutions in codons 12 and 13, were validated as negative predictors of response to anti-epidermal growth factor receptor antibodies. Therefore, determining the KRAS mutational status of tumor samples has become an essential tool in managing patients with colorectal cancers (2). The aim of current study was to develop a highly sensitive method for detecting somatic mutations of KRAS gene for genotyping CRC patients.
Material and Method

Study Samples: The study population consisted of 40 patients (25 males and 15 females) with age ranged (26–82 years) diagnosed with Colorectal Cancer in diseases teaching hospital during the period from March 2018 to the end of May 2018. In addition, 20 normal healthy subjects were selected as controls.

DNA Extraction: Whole blood samples (5mL) were drawn via vein puncture into tubes containing EDTA and samples were stored at −20°C until DNA extraction. Genomic DNA was extracted from whole blood using Quick-gDNA™ Blood MiniPrep/Zymo/U.S.A.

KRAS gene by symmetric PCR technique (RT-PCR): The following primers for genotyping positive strand for KRAS gene F-5’-AGG CCT GCT GAAAA TGA CTG -3’ R-5’-TTG GAT CAT ATT CGTCCA CAA-3’ and Cy5 (Probe 1) 5’-CTT GCC TAC GCC ACC AGC TCC AACT-BHQ2-3’, while genotyping negative strand for KRAS gene F 5’-AGG CCT GCT GAAAA TGA CTG-3’ R-5’-TTG GATCAT ATT CGTCCA CAA-3’ and ROX (Probe2) 5’- AGT TGG AGC TGG TGG C GT AGG CAAG-BHQ2 - 3’. The mixture for the PCR reaction contained 10 μL of tGoTaq Probe qPCR Master Mix, 0.2 μL Probe, 0.4μL (Forward and Reverse primer), 4.0μL Nuclease-free water, and 5μLDNA Sample Volume. PCR conditions for these amplifications were: 5 minutes at 95°C, denaturation 15 sec at 95°C, alignment Annealing/Extension 10 sec at 55°C, Detection (Scan) 15 sec at 72°C and Melting curve of 15 sec at 55–95°C.

Results and Discussion

The following genotypes related to KRAS, GC (wild genotype) and AC, AT and GT (mutant genotypes) were studied and the results were shown in Table (1). The rates of the wild genotype (GC) were 24 (60.0 %) and 15 (75.0 %), in study and control groups, respectively. The mutant genotype (AC) was more frequent, 8 (20%), in study group than in control group, 3 (15.0 %). However the difference did not reach statistical significance (P= 0.724).

The mutant genotype (AT) was equally frequent in study and control groups, 2 (5.0 %) versus 1 (5.0 %), respectively, P= 0.724. The mutant genotype (GT) was more frequent in study group, 6 (15%), than was in control group, 1 (5.0 %), however, the difference did not reach statistical significance (P= 0.394; Table 3). Overall, the frequency of mutant genotypes was more in study group, 40%, than in control group, 25 %, but the difference was not significant in statistical terms (P= 0.251; Table 2).

The risk of mutant KRAS genotype in association with colorectal cancer was assessed in terms of Odds ratio which was 2.0 (95 % confidence interval of 0.61 - 6.60). This implied that persons harboring mutant KRAS genotypes are at two-fold risk of developing colorectal carcinoma than general population and the etiologic fraction (EF) of these mutant genotypes collectively accounted for 0.38 (Table 2). The results of the HRMA (amplification and melting curve) showed the melting curve results of only 35 samples (Figure 1). An advantage of performing HRMA analysis on a real time PCR machine with HRM capability, is that the PCR amplification and HRM analysis are performed in the same run and the results are available for analysis at the end of the run. In addition, Figure (2) showed the difference between two types of KRAS mutation melting curve.

Table 1: KRAS genotypes in control and study groups

<table>
<thead>
<tr>
<th>KRAS genotype</th>
<th>Control group n = 20</th>
<th>Study group n = 40</th>
<th>P *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild</td>
<td>15 (75.0 %)</td>
<td>24 (60.0 %)</td>
<td></td>
</tr>
<tr>
<td>Mutant</td>
<td>5 (25.0 %)</td>
<td>16 (40.0 %)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KRAS genotype</th>
<th>Control group n = 20</th>
<th>Study group n = 40</th>
<th>P *</th>
</tr>
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<tr>
<td>Wild</td>
<td>15 (75.0 %)</td>
<td>24 (60.0 %)</td>
<td></td>
</tr>
<tr>
<td>Mutant</td>
<td>5 (25.0 %)</td>
<td>16 (40.0 %)</td>
<td></td>
</tr>
</tbody>
</table>

n: number of cases. *: Fisher exact test. NS: not significant.

Table 2: Mutant and wild type KRAS genotypes according to study groups

<table>
<thead>
<tr>
<th>KRAS genotype</th>
<th>Control group n = 20</th>
<th>Study group n = 40</th>
<th>χ²</th>
<th>P *</th>
<th>OR</th>
<th>95% CI</th>
<th>EF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild</td>
<td>15 (75.0 %)</td>
<td>24 (60.0 %)</td>
<td>1.319</td>
<td>0.251 NS</td>
<td>2.0</td>
<td>0.61 - 6.60</td>
<td>0.38</td>
</tr>
<tr>
<td>Mutant</td>
<td>5 (25.0 %)</td>
<td>16 (40.0 %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n: number of cases. *: Chi-squared test. NS: not significant. OR: Odds ratio. CI: confidence interval. EF: etiologic fraction.
In this study the aim was to develop a highly sensitive method for detecting somatic mutations of KRAS gene for genotyping CRC patients. The high resolution melting analysis technique (HRMA) applied to mutation scanning is often implemented in high-resolution format. Upon the completion of amplification, PCR products are subjected to the melting procedure in the presence of fluorescent probes. Characteristic changes in DNA melting curves indicate the presence of mismatched bases in the duplexes and, therefore, the presence of mutations (3).

Since TaqMan probes were present in the incubation medium at both steps of the analysis (amplification and melting curve), the analysis can be carried out in the closed tube format. This was a 1.5–2h assay in a single tube without any intermediate or additional procedures that minimize not only time and labor expenditures, but also the probability of the cross contamination of samples which is the most important. As a results, the HRMA method is much more sensitive than Sanger sequencing (3). Our results agreed with (4,5) who revealed that codon 12AC mutations were more frequent in patients followed by codon 13 mutation.

Conclusions

On the basis of current study findings, significant over productions of KRAS mutations seemed to have potential role in colorectal cancer progression and worse prognosis when compared with healthy people.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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REFERENCES


Evaluation of Malondialdehyde and Glutathione in the Treated and Newly Diagnosed Iraqi Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Background: Diabetes mellitus is a group of metabolic disorders that is characterized by elevated levels of glucose in blood and insufficiency in production or action of insulin produced by the pancreas inside the body. Current study was aimed to investigate the biochemical profiles of Iraqi obese patients with type 2 diabetes mellitus.

Method: Fifty treated diabetic patients with type 2 diabetes mellitus, twenty five newly diagnosed diabetic patients and thirty healthy individuals as control subjects were included. The biochemical analysis included measurements of malondialdehyde and glutathione in all the subjects.

Results: Data from current study revealed highly significant increase in serum MDA in both newly diagnosed T2DM (P<0.01) and treated T2DM patients. Furthermore, serum GSH levels were significantly reduced in these groups as compared to those in control group (P<0.05). In addition, higher GSH level was observed in treated T2DM patients as compared to the newly diagnosed group (P<0.05).

Conclusion: Abnormally high levels of lipid peroxidation and the simultaneous decline of antioxidant defense mechanisms can lead to damage of cellular organelles and oxidative stress.

Keywords: T2DM, oxidative stress, anti-oxidants, MDA, GSH.

Introduction

Diabetes mellitus (DM) is a chronic endocrine disorder characterized by hyperglycemia resulting from absolute or relative insulin deficiency with disturbances in carbohydrate, fat and protein metabolism due to the defects in insulin secretion and/or insulin action. Diabetes mellitus is classified into Type 1, which refers to a condition where there is chronic progressive beta cell destruction (¹), and Type 2, which is the most common type of diabetes that occurs due to the decreased biological response to insulin (²).

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In the early stages, beta cells respond to insulin resistance by secreting increased quantities of insulin and thus maintaining blood sugar at normal levels. However, gradually beta cells begin to fail and insulin levels decrease resulting in rising of blood sugar (³).

The term antioxidant has been defined as any substance, exogenous or endogenous in nature that delays or inhibits oxidative damage to a target molecule and protects biologically important molecules such as DNA, proteins and lipids from oxidative damage and, consequently, reduces the risk of several chronic diseases. Common antioxidants include the glutathione and the enzymes superoxide dismutase, catalase and glutathione reductase (⁴). The highest concentration of glutathione is in the liver making it critical in the body’s detoxification process (⁵).

Taken together, the aim of current study was to investigate the homeostatic alterations at biochemical levels in Iraqi patients suffering from Type 2 diabetes mellitus.
Materials and Method

This case control study was carried out at AL-Khademiya Hospital during the period from June-December 2017. The study was conducted on 105 obese Iraqi subjects with type 2 diabetes mellitus (T2DM). They were recruited into the following groups:

**Group (A):** Included 65 patients whose age ranged from 42 to 71 years (mean ± SD age was 57.3 ± 1.35). These patients were already treated with metformin 500mg three times daily and glibenclamide 5mg twice daily.

**Group (B):** Included 40 patients (newly diagnosed with T2DM). These patients did not receive treatment for DM. Their age ranged from 39-67 years with mean ± SD age of 51.82 ± 2.5 years. Diagnosis was made by consultant physicians for patients as having T2DM depending on patient’s history and clinical examination laboratory investigations.

**Group (C):** Thirty normal healthy individuals (controls) were enrolled in this study. Their age ranged from 40–61 years with mean ± SD age of 54.6 ± 1.07 years.

**Measurement of serum Malondialdehyde (MDA) level:** Blood samples were collected by drawing 2.5ml of blood from each subject. Test was conducted according to (6). The assay was based on the reaction of a chromogenic reagent, 2-thiobarbituric acid, with MDA at 25°C. One molecule of MDA reacts with 2 molecules of 2-thiobarbituric acid to yield a chromophore with absorbance maximum at 450nm.

The concentration of serum Malondialdehyde (MDA) in each sample was extra plotted from MDA standard curve (Figure 1).

**Measurement of serum glutathione (GSH) concentration**

**Principle of Assay:** The general thiol reagent, 5-5’-dithiobis [2-nitrobenzoic acid] (DTNB), reacts with GSH to form the 412nm chromophore, 5-thionitrobenzoic acid (TNB) and GS-TNB. The GS-TNB is subsequently reduced by glutathione reductase and β-nicotinamide adenine dinucleotide phosphate (NADPH), releasing a second molecule (TMB) and recycling the GSH; thus amplifying the response (7). Any oxidized GSH (GSSG) initially presents in the reaction mixture or formed from the mixed disulfide reaction of GSH with GS-TNB is rapidly reduced to GSH (8). The concentration of serum glutathione in each sample was extra plotted from GSH standard curve (Figure 2).

**Results and Discussion**

Table (1) revealed highly significant increase in serum MDA in both newly diagnosed T2DM (P<0.01) and treated T2DM patients. Furthermore, serum GSH levels were significantly reduced in these groups as compared to those in control group (P<0.05). In addition, higher GSH level was observed in treated T2DM patients as compared to the newly diagnosed group (P<0.05). The present result was in agreement with Biplab et al. (2010) who pointed that MDA (as an oxidative stress marker) plays a significant role in the pathogenesis of T2DM and its complications.
Table 1: Plasma antioxidant defense mechanisms in obese T2DM patients (treated and newly diagnosed) and control subjects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Controls N= 30</th>
<th>Newly diagnosed N= 40</th>
<th>Treated patients with T2DM N= 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDA (nmol/ml) (Mean ± SD)</td>
<td>2.1 ± 1.6</td>
<td>12.4 ± 5.13 *&lt;sup&gt;a&lt;/sup&gt;</td>
<td>7.46 ± 3.09 *&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>GSH (ng/ml) (Mean ± SD)</td>
<td>27.5 ± 1.8</td>
<td>8.51 ± 0.18 *&lt;sup&gt;a&lt;/sup&gt;</td>
<td>16.7 ± 2.01 *&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

* ANOVA: new diagnosed or treated T2DM vs. control: * P<0.05, ** P<0.01)

MDA: Malondialdehyde, GSH: Reduced glutathione

MDA levels were reported to be significantly increased in both groups with complicating T2DM cases. This explains the generation of reactive oxygen species (ROS) during disease process. The generation of ROS has been potentiated by the marked increase in lipid peroxidation product (MDA) in the disease process (9).

The significant hyperglycemia along with raised plasma MDA level in diabetes groups explained their contribution towards free radical production as well as generation of oxidative stress (10).

Abnormally high levels of lipid peroxidation and the simultaneous decline of antioxidant defense mechanisms can lead to damage of cellular organelles and oxidative stress. Many reports are available with regard to oxidative stress and antioxidant status of type 2 diabetic patients (10). High levels of MDA with decreasing in GSH concentration in serum of type 2 diabetic patients is widely reported. Also, this depletion of GSH is considered to be indicative of increased oxidative stress (12).

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Presentations of Congenital Heart Disease in Children

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ABSTRACT

Congenital heart disease (CHD) is the utmost widely recognized class of natal defects. CHD involves wide scope of cardiovascular deformities from basic structures exhibiting in the prompt infant time frame to mellow imperfections, for example, bicuspid aortic valve, which might not be predictable till parenthood. Early finding for those below 1yr of age having critical congenital heart disease (CCHD) diminishes both mortality and grimness while postponed analysis has been appeared to prompt noteworthy mortality.

This study aim for study age, gender distribution and frequency of clinical presentation of CHD.

A prospective study accompanied through 3 years since 1st of July 2015 till 1st of July 2018 & encompass 198 patients with CHD consult the outpatient clinic in Al-Diwaniyah city, Al-Qadisiyah, Iraq, each patient was recorded the 1st time diagnosed as CHD; with history, examination, send for x-ray of chest, ECG, & ECHO study & also record the cause of presentation at 1st time when he was diagnosed as CHD.

In our study, total cases were 198, male 118 (60%), female 80 (40%). Age of presentation, in acyanotic CHD results were {<1month 26%, 1-3m 38%, 3-6m 21%, 6-12m10%,.>1year 5%}, in cyanotic CHD results were {<1month 73%, 1-3m 27%}.According to causes of presentation in acyanotic 47% were presented with chest infection, 18% had heart failure & failing to thrive "HF+FTT", 35% had murmur discovered on routine examination of baby at outpatient clinic while in cyanotic type 100% the cause of presentation were cyanosis.

Many patients with CHD discovered by routine physical examination, so full cardiac examination must be done for all patients as a routine role after delivery before discharge from hospital.

Keywords: Congenital heart disease (CHD), ventricular septal defect (VSD), tetralogy of Falot (TOF), patent ductus arteriosus (PDA), pulmonary stenosis (PS), atrial septal defect (ASD).

Introduction

(CHD) had been happen roughly in 0.8% of live birth. The frequency is greater in stillborn (3-4%), unconstrained abortions (10-25%), and untimely newborn children (about 2% barring PDA). The determination is built up by 1wk of age in ~40-50% of patients with CHD and by age of one month in~50-60% of patients¹)

CHD is the utmost well-known class of natal defects²,³ CHD contains wide-ranging scope of cardiovascular abnormalities from basic structures showing in the prompt infant time frame to mellow imperfections, for example, bicuspid aortic valve, which might not be predictable till parenthood. Regardless of noteworthy advancement in clinical consideration for influenced people, CHD relics the main source of baby death amongst natal anomalies ⁴ For babies that surviving early period, there were a great proportion of comorbidities, together cardiovascular and extracardiac & predictable life expectancy was as yet lessened ⁵

In newborn children with a CCHD, the danger of ill health & mortality increments when there is postponement in the determination & opportune referral to tertiary unit⁶

Newborn children with (CCHD) necessitating invasive or catheter intercession within 1st year of lifespan are in danger for cardiovascular breakdown

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or else passing whenever released from the birth emergency clinic deprived of a CCHD conclusion (7) If not recognized instantly, CCHDs may have calamitous outcomes (8,9). This postponed finding has been appeared to prompt huge mortality just as generous short-and long morbidity for survivors (6,7).

The previous 3 decades have seen generous walks in managing heart disease by a 39% decrease in death due to CHD somewhere in the range of 1979 and 1997 (10). Stagnant, CHD relics a huge reason for natal and baby death in the United States (US), representing 29% of passings because of birth deformities and 5.7% of all newborn child passings. (11) Neonates represent 57% of newborn child death as a result of CHD (12). CHD that necessitates obtrusive intercession within 1st month of life had been named CCHD.

Unrecognized neonatal CHD conveys a genuine danger of preventable death, dreariness, & impairment (13) Clinical examination earlier to release from hospital and of newborn children at about 45 days of age for any sign of CHD is suggested in Health for All Children (14).

Upgrades in diagnosing, treating, & surgical repairing are changing the survival arrangement of CHD. As of late the survival of progressively complex sorts of inborn CHD has enhanced, prompting an expanding remaining task at hand for development, reinvestigation, and reoperation. Over a similar time, the consideration of grown-ups with CHD has started to create as a different subspecialty (15). It appears to be likely that everything except those with the least difficult types of CHD will require authority development, & this would be the principle development territory in consideration of those having heart disease (16).

Materials and Method

A prospective study accompanied through 3 years since 1st of July 2015 till 1st of July 2018 & encompass 198 patients with CHD consult the outpatient clinic in Al-Diwaniyah city, Al-Qadisiyah, Iraq, each patient was recorded the 1st time diagnosed as CHD; with history, examination, send for x-ray of chest, ECG, & ECHO study & also record the cause of presentation at 1st time when he was diagnosed as CHD.

Results

In our study, total cases were 198, male 118 (60%), female 80 (40%), as showing in figure-1.

![Figure 1: Sex Ratio](image1)

Sex distribution in acyanotic CHD was male 92 (60%) & female 62 (40%), while in cyanotic CHD was male 26 (59%) & female 18 (41%), as showing in figure 2.

![Figure 2: Sex Distribution & Type of CHD](image2)

Sex distribution in each specific type of CHD & their percent from total cases as showing in figure 3.

![Figure 3: Types of CHD & Sex](image3)

According to age of presentation, in a Cyanotic CHD results were {<1month 26%, 1-3m 38%, 3-6m 21%, 6-12m10%>,>1year 5%}, in cyanotic CHD results were {<1month 73%, 1-3m 27%} as showing in figure 4.
According to causes of presentation in acyanotic type, 47% were presented with chest infection, 18% had heart failure & failing to thrive "HF+FTT", 35% had murmur discovered on routine examination of baby at outpatient clinic while in cyanotic type 100% the cause of presentation were cyanosis, as showing in table 1 & figure 5.

**Table 1: Causes of Presentation of CHD**

<table>
<thead>
<tr>
<th>Causes</th>
<th>% from total</th>
<th>% from acyanotic</th>
<th>Cyanotic</th>
<th>% from cyanotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest infection</td>
<td>36%</td>
<td>72</td>
<td>47%</td>
<td>0</td>
</tr>
<tr>
<td>HF + FTT</td>
<td>14%</td>
<td>28</td>
<td>18%</td>
<td>0</td>
</tr>
<tr>
<td>On Routine Exam</td>
<td>27%</td>
<td>54</td>
<td>35%</td>
<td>0</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>22%</td>
<td>0</td>
<td>-</td>
<td>44</td>
</tr>
</tbody>
</table>

In our study VSD, ASD & PDA account for 69% which similar to study in the Hospital das Clínicas at Maternity Unit joined the Latin-American collaborative study of congenital malformations, where the results of all clinical presentations of heart diseases were analyzed together (ASD), (VSD) & (PDA) accounted for 62.6% of all imperfections recognized, the results to some extent higher in our study (23).

The most common CHD in our study were VSD & TOF, similar results in study in Iran 2006, also similar results in M:F ratio in both studies CHD higher in males 1.5:1, also in this study results were CHD presented more frequently during infancy (46%), while in our study 96% of presentation at age< 1yr. A cyanotic disease was noticed in 58 (69 %) cases, in our study 95% whereas cyanotic disease was noticed in 26 (31%), in our study 100% of cyanotic discovered at age cases <1yr.

Among cyanotic disease, (VSD) was found in (58.3%) while in our study 60%, (ASD) (4.8%) in our study 3%, defect of endocardial cushion in 2 patients (2.4%) while A.V Canal defect in our study 3%. Amongst cyanotic disease, (TOF) accounted for 13.1% in our study TOF about 20%. These higher results in our study due to new advances occurred in last years in detecting & diagnosing the disease when we in doubt.

**Discussion**

Cardiovascular anomalies are the most widely recognized gathering of congenital abnormalities. Later planned investigations, with prepared accessibility of timely echocardiographic checkup, have appeared higher of pervasiveness of alive conceived heart anomalies, practically which is all represented by the discovery of even more little ventricular septal defects (17-19). These results similar to results in our study where VSD represent the higher prevalence 60%.

Early acknowledgment of these anomalies is essential in light of the fact that clinical introduction and crumbling might be abrupt (20) and specific curable imperfections might even reason for mortality beforehand diagnosing them (21,22).

Figure 4: Age of Presentation of CHD

Figure 5: Causes Of Presentation CHD.
In this study, the furthermost communal clinical arrangements were developmental delay & "failure to thrive" (FTT) (86.9%), shortness of breath (69%), chest infection (52%), heart failure (46%), cyanosis (20.2%), while in our study results were chest infection (36%), HF + FTT (14%), on routine exam (27%), cyanosis (22%); according to these results cyanosis similar percent while previously FTT was higher which may be due to delayed diagnosis previously in comparison to early diagnosis in recent years (24).

So on the routine cardiac examination must be done at delivery room, before discharging baby from neonatal care unit & in those visiting outpatient clinics for any purposes or visiting a health center for routine checkup or for receiving vaccine, because high percent of CHD that discovered on routine checkup (murmur), chest infection, cyanosis or FTT that blamed to CHD.

The importance of early diagnosis for early intervention before missing patient because duct dependent disease or shunt dependent CHD which can lead to death even before diagnosis.

**Conclusion**

Many patients with CHD discovered by routine physical examination, so full cardiac examination must be done for all patients as a routine role after delivery before discharge from hospital.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Sero Levels of Lipocalin-2 in RA Patients

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ABSTRACT

Rheumatoid arthritis (RA) is a constant systemic autoimmune seditious disease. Although the precise etiology of disease is not known, but up to date studies demonstrate that lipocalin-2 (LCN-2) is a recognized seditious biomarker, LCN2 is involved in innate immunity by sequestrating iron that in turn limits bacterial growth that has an optimistic relationship with body mass index and a variety of metabolic syndromes.

Study intended to look the level of lipocalin-2 and their relationship with Body Mass Index BMI among patients with RA.

Patients with RA (103) that divided in to two groups(56 new early diagnosis group;47 early diagnosis with treated group), were included diagnosis according to American College of Rheumatology (ACR) criteria and 25 subjects as healthy control group. All demographic (Age and Gender), clinical data (Body Mass Index BMI) and serological data (serum lipocalin-2, ACPA, CRP and RF investigated by ELISA methods. Rheumatic Arthritis of both groups divided according to RF results in to two subgroups (seropositive 36, seronegative 20 at new early diagnosis RA group) and (seropositive 32, seronegative 15 early diagnosis RA with treated group). Mean and SE of serum lipocalin-2 level in patients with RA (9.44±1.620ng/ml), as compared to healthy control individuals (7.28±1.055ng/ml) were significantly higher. Positivity result of Anti-CCP in patients groups 94 (91.3%), as compare with positivity Anti-CCP 0 (0.00%) at healthy control group. No significant difference of lipocalin-2 between RF+ve and RF-ve (P>0.05) at both groups, but high significant deference among Anti-CCP and ESR between RF+ve and RF-ve of new early diagnosis RA group and high significant deference of CRP and ESR at early diagnosis RA treated group. Present study had no important correlation between lipocalin-2 levels and BMI in both groups, except among RF-ve (early diagnosis RA treated groups). These consequences point to that serum LCN-2 levels may be used as a pathogenic pointer in the early on period of the sickness but do not able to be used to pointer in the analysis of RA.

Keywords: Serum Lipocalin-2, New early RA diagnosis, Body Mass Index BMI.

Introduction

Rheumatoid arthritis is an autoimmune disarray which affects mostly small joints hand and feet and has a lot of systemic manifestations (1). The auto antigens recognized by autoantibodies include cartilage components, chaperones, enzymes, nuclear proteins and citrullinated proteins (2). A biomarker is defined as organic marker, usually refers to a assessable pointer of a number of natural condition or state. Discovering original biomarkers in RA studies attract scientist to know the input roles in a variety of stages of development, leftovers a subject matter of attention for RA. Since destructive factor such as lipocalin-2 known as inflammatory biomarker, it is a 25kDa protein that have monomeric, homodimeric, and heterodimeric forms, this a protein that found in humans is priarranged by the LCN2 gene (3); it is more often than not synthesized as of the adipose tissue and liver cells (4). After additional explore, LCN-2 was recorded to be spoken from a variety of other cells. As, throughout irritation it is synthesized from epithelial cells. LCN-2 plays a position in different cellular proceedings, as well as immune response, differentiation, and tumorigenes (5). With greater than before LCN-2 gene expression in the livers and fatty tissue of the
hereditarily heavy animals \(^{(6)}\). So study aimed to give the impression about level of lipocalin-2 in RA patients and its significant difference between seronegative and seropositive RF and study their relationship with Body Mass Index BMI among patients with RA.

**Materials and Method**

Data collected during the period from March – September 2017. This study includes group of (103) patients with early rheumatoid arthritis of less than 1 year duration that classify according to (ACR) criteria (56 patients with new early diagnosis without treatment group and 47 patients early diagnosis RA treated group) and (25) healthy control subjects and patients divided in to two subgroup (seropositive 36, seronegative 20 of new early diagnosis RA group) and (seropositive 32, seronegative 15 of early diagnosis RA with treated group). Questionnaire form formulated which involved name, age, sex and BMI by (Kg/m²).

**Specimen:** Venous blood spacemen’s (5ml) that were collected from patients and healthy controls; 3 ml of each sample for serum separation, and the other part remains of whole blood were collected for ESR test by westregren method.

**Study Protocols:** Quantitative measurement of lipocalin-2, Anti-CCP, C-reactive protein (CRP), rheumatoid factor(RF) by Enzyme Linked Immuno-Sorbent Assay (ELISA),according to the manufactures protocol (R&D Systems USA, Chorus Italy, Agappe Switzerland and Chorus Italy, respectively). Body Mass Index (BMI)=Kg/m².

**Statistical Analysis:** Statistical analysis was performed using the SPSS 10 statistical package. Mean, SD and SE were used to express variables. The outcome of study were evaluated using a nonparametric and parametric statistical methods for information with non-normal and normal distribution, respectively. T test was second-hand to contrast the differentiation in mean among two incessant numeric variables, differences that were considered significant statistically at \(P<0.05\).Between-group comparisons were complete the Spearman’s rank association coefficient process for non-normally distributed data and Pearson’s product-moment correlation for normally distributed variables \(^{(7)}\).

**Result**

**Demographical and clinical characteristic of studied groups:** Demographical characteristics variables, patients information such that age and gender were recorded. Clinical parameter such as body mass index (BMI). The mean age patients \((42.22\pm11.23\) years) while \((36.40\pm11.15\) years) of healthy controls, gender of patients comprised female \((74.8\%)\) and male \((25\%\)\), body mass index BMI results showed (normal weight \(28\) (27.2 %), over weight \(31\) (30.1%), obese \(44\)\(42.7\%\) patients vs (normal weight \(12\) (48.0%), over weight \(4\)\(16.0\%), obese \(9\) (36.0%) in controls. The study showed that the number and percentage of studied groups according to positively results of ESR, RF, CRP and ACPA, elevated results of ESR patients \(82\) (79.6%), while healthy control group \(2\) (8.00%), positivity RF,CRP and Anti-CCP of patients results showed \(67\) (65.0%), \(89\) (86.4), and \(94\) (91.3%), respectively. Parameter which represents biomarker such as lipocalin-2 was measured in patients and compared with controls, the results showed that mean and SE of Lipocalin-2 was \((9.44\pm1.620\) ng/ml) vs \((7.28\pm1.055\) ng/ml) of patients with RA and healthy control group, respectively.

**Distributions of markers among studied groups according to RF subgroups:** Studied different parameter’s readings along all different of RF groups, which proved of having normal distribution function, since probability levels of significant through testing goodness of fit are accounted \(P>0.05\).

**Table 1: Mean levels of lipocalin-2, Anti-CCP,CRP and ESR among studied subgroups of RA patients**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Markers</th>
<th>Groups</th>
<th>No.</th>
<th>Mean</th>
<th>SD</th>
<th>SE</th>
<th>t-test</th>
<th>df</th>
<th>P-value (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>Concentration lipocalin-2=ng/ml</td>
<td>RF+ve</td>
<td>36</td>
<td>7.1</td>
<td>6.0</td>
<td>1.0</td>
<td>-1.383</td>
<td>54</td>
<td>0.172 NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF-ve</td>
<td>20</td>
<td>9.6</td>
<td>7.2</td>
<td>1.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anti CCP AU/ml</td>
<td>RF+ve</td>
<td>36</td>
<td>102.8</td>
<td>100.2</td>
<td>16.7</td>
<td>4.768</td>
<td>36</td>
<td>0.000 HS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF-ve</td>
<td>20</td>
<td>22.6</td>
<td>9.1</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reactive Protein (C.R.P.) mg/L</td>
<td>RF+ve</td>
<td>36</td>
<td>23.1</td>
<td>20.7</td>
<td>3.4</td>
<td></td>
<td></td>
<td>0.362 NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF-ve</td>
<td>20</td>
<td>17.4</td>
<td>25.7</td>
<td>5.8</td>
<td>0.919</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Erythrocyte Sedimentation Rate (E.S.R.) mm/h</td>
<td>RF+ve</td>
<td>36</td>
<td>60.1</td>
<td>34.6</td>
<td>5.8</td>
<td>4.156</td>
<td>53</td>
<td>0.000 HS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF-ve</td>
<td>20</td>
<td>28.9</td>
<td>21.6</td>
<td>4.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Concentration lipocalin-2=ng/ml</th>
<th>RF+ve</th>
<th>32</th>
<th>9.9</th>
<th>7.6</th>
<th>1.4</th>
<th>-1.502</th>
<th>45</th>
<th>0.140 NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF-ve</td>
<td>15</td>
<td>13.8</td>
<td>9.8</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anti CCP AU/ml</th>
<th>RF+ve</th>
<th>32</th>
<th>9.9</th>
<th>7.6</th>
<th>1.4</th>
<th>-1.502</th>
<th>45</th>
<th>0.140 NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF-ve</td>
<td>15</td>
<td>13.8</td>
<td>9.8</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reactive Protein (C.R.P.)</th>
<th>RF+ve</th>
<th>32</th>
<th>16.1</th>
<th>14.1</th>
<th>2.5</th>
<th>3.445</th>
<th>41</th>
<th>0.001 HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF-ve</td>
<td>15</td>
<td>6.8</td>
<td>4.2</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Erythrocyte Sedimentation Rate (E.S.R.)</th>
<th>RF+ve</th>
<th>32</th>
<th>50.7</th>
<th>22.0</th>
<th>3.9</th>
<th>5.384</th>
<th>45</th>
<th>0.000 HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF-ve</td>
<td>15</td>
<td>25.3</td>
<td>10.4</td>
<td>2.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) HS: Highly Sig. at P<0.01; NS: Non Sig. at P>0.05.

Serum lipocalin-2 level in table (1) recorded its concentration in RF+ve patients less than in RF-ve patients at both groups and showed no significant difference among studied groups, higher sera Anti-CCP,CRP and ESR levels appeared in RF+ve patients group compared to RF-ve patients group with high significant differences of (Anti-CCP and ESR at new early diagnosis RA group, CRP and ESR at early diagnosis RA treated group) at (p<0.05).

**Correlation of studied parameters with BMI:** Table (2) shows Person’s correlation coefficients among different studied groups of RA disease with comparisons significant.

<p>| Table 2: Correlation ships among parameters of studied subgroups of RA disease and BMI |</p>
<table>
<thead>
<tr>
<th>Groups</th>
<th>Parameter</th>
<th>Pearson Correlation</th>
<th>Lipocalin 2</th>
<th>Anti-CCP</th>
<th>RF</th>
<th>CRP</th>
<th>ESR</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF-(new e.RAgroup)</td>
<td>BMI</td>
<td>Corr. -0.22</td>
<td>0.225</td>
<td>0.430</td>
<td>-0.24</td>
<td>-0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. 0.36</td>
<td>0.341</td>
<td>0.058</td>
<td>0.313</td>
<td>0.983</td>
<td></td>
</tr>
<tr>
<td>RF+(newe. RAgroup)</td>
<td>BMI</td>
<td>Corr. 0.18</td>
<td>-0.14</td>
<td>-0.10</td>
<td>0.080</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. 0.306</td>
<td>0.425</td>
<td>0.551</td>
<td>0.644</td>
<td>0.611</td>
<td></td>
</tr>
<tr>
<td>RF-(e.treated group)</td>
<td>BMI</td>
<td>Corr. 0.669</td>
<td>-0.26</td>
<td>0.026</td>
<td>-0.18</td>
<td>-0.17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. *0.006</td>
<td>0.344</td>
<td>0.927</td>
<td>0.530</td>
<td>0.558</td>
<td></td>
</tr>
<tr>
<td>RF+(e.treated group)</td>
<td>BMI</td>
<td>Corr. 0.090</td>
<td>-0.01</td>
<td>-0.04</td>
<td>-0.15</td>
<td>-0.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. 0.625</td>
<td>0.943</td>
<td>0.824</td>
<td>0.403</td>
<td>0.561</td>
<td></td>
</tr>
</tbody>
</table>

(*) HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Sig. at P>0.05

Respect to subject of BMI and patient’s groups, some studies markers has accounted strong and significant relationships in at least at p< 0.05 concerning early diagnosis RA treated groups with RF-ve, while negatively relationships with the leftover groups (i.e. Treated RF+ve, and RF-ve). Briefly in early diagnosis RA treated group who have RF-ve, the results showed significant correlation between BMI and level of lipocalin-2(p= 0.006), but no significant relationships between BMI and (Anti-CCP, RF, CRP and ESR) among studied groups.

**Discussion**

The present study revealed that prevalence of RA was more in female patients than male patients similar to result in 2014 showed (75.25% vs 24.75%, respectively) and this study suggests that augment aging can show the way to constant inflammation and resistant mediated tissue injure (8). Other study have shown opposite result more frequent in men than in women (72% versus 55%, respectively) (20).

Anti-CCP, RF, CRP and ESR in present study showed high positive result compare with control, similar to study recorded that RF, Anti-CCP, CRP and ESR with high levels was obliging for the confirmed diagnosis of RA (10). In present study patients with positive RF and Anti-CCP more than with negative RF and Anti-CCP test results. Thus, these parameters could be worn as exact serologic markers for RA (11). In present study found the
strength relations of Anti-CCP and RF, indeed, results of present study in antibody discordant patients suggest that RF may be more closely connected with augmented level of Anti-CCP at RA patients, agree with study showed RF and Anti-CCP had highest autoantibody concentrations at RA patients (12). Present data reveals that LCN-2 levels are superior in patients with RA than in healthy individuals, likewise to consequence establish in their data that serum LCN-2 levels were elevated in RA patients than in healthy controls (13). There was not a meaningful difference between serum LCN-2 levels between RF(+) and RF(-) patients and serum LCN-2 levels of RF(−) patients more than in RF(+), agree with study by Gulkesen and his coworker who recorded serum RF and CCP levels did not correlate with LCN-2 levels (14). However, contrary results were also reported with no increase level of lipocalin-2 in RA patients (15). Tissue allocation and appearance of LCN-2 in neutrophils, bone marrow, and tissues bare to germs, such as the trachea, lung, stomach, salivary gland, and colon (3) point to its taking part in seditious responses. In neutrophils, LCN-2 secretion is very keeping pace by infection and the commencement of frustration (16).

Obesity comprised (42.7%) of patients RA and this agree with study recorded about 66% of patients with RA are obese, extreme overweight leads to superior manufacture of provocative proteins that augment the joint irritation due to the illness itself (17). So, numerous factors connected with RA may be probable penalty of disease quite than related to illness danger, however, fat individuals had a considerably augmented risk of RA disease (18).

The involvement of body mass index (BMI) with parameters levels at RA patients, recorded important relations between events of BMI and lipocalin-2 among RF-ve at (early diagnosis RA with trated group). Nevertheless, not showed significant correlation between BMI and others markers (Anti-CCP, RF, CRP and ESR) among studied group. Study reported Lipocalin-2which has a positive relationship with body mass index, and a variety of metabolic syndromes (19). Jon and his co-workers reported major relations between every one events of adiposity, chiefly truncal fat, and CRP levels in women (20), but study showed like the result in present study that BMI had negative correlation with CRP and ESR (21).

Conclusion

These consequences point to that serum Lipocalin-2 levels increased in RA patients compared in healthy control. Perhaps used as a pointer for structural injure like erosions in the early on period of the illness but do not able to be –used to checker in the analysis of RA disease. An intensify of body mass index can give lipocalin-2 and show the way to a superior danger for RA progress. However, the judgment as well places of interest the require for research on the relationship between body mass index and RA risk with alteration for more confusing factors.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Comparative Study for the Diagnostic Features of BNP and HS-CRP in Patient with Heart Failure

Salam H¹, Raid M¹, Adnan T.²

¹Chemistry Dept., College of Science, ²College of Medicine, University of Thi-Qar, Iraq

ABSTRACT

A large number of diagnostic tests are used to confirm the presence of heart failure (HF) disease including symptoms and clinical signs of HF, radiological examinations, echocardiography, electrocardiography and laboratory blood tests. Also in recent years, in 1988, a new cardiac natriuretic peptide [B-type natriuretic peptide (BNP)] with excellent diagnostic characteristics was discovered. Wherefore, in the next years was appeared to have prognostic properties and later likewise seemed to have symptomatic properties in the outpatient settings and emergency department.

In this research we completed work with participants, part of them patients with heart failure to varying degrees and another part do not suffer from heart failure to be a control group on which to build the results of the research. We pulled the blood from them, turned it to serum, estimated concentrations of certain chemical agents that are under research such as (BNP, hs-CRP, T-Chol, HDL-cholesterol, TG, LDL-cholesterol and VLDL-cholesterol) and compared these concentrations with another factor (EF %). Generally, we found a clear increase in concentrations of BNP and hs-CRP (Percentage increase in BNP and hs-CRP concentration level is estimated at 497%, 332 % which is 5, 3.32 times as much as the BNP and hs-CRP concentration in control group D respectively), with the greater decline in the value of EF%. As well as compared to other factors (Percentage increase in T-Chol, TG, LDL-cholesterol, VLDL-cholesterol and percentage decrease in HDL-cholesterol.). Therefore, the BNP and hs-CRP are the two best factors of the total factors studied in the research to diagnose heart failure disease.

Keywords: Heart Failure (HF), Brain Natriuretic Peptide (BNP), Lipid Profile

Introduction

Heart failure (HF) is a complex clinical disorder and the end phase of all diseases of the heart that happens when the heart decreases its ability to supply sufficient blood stream all through the body. Furthermore, there is numerous reasons for HF with the goal that coronary artery disease, hypertension, cardiomyopathy, valvar and congenital heart disease, arrhythmias, alcohol and drugs, “high output” failure, pericardial disease and primary right heart failure [1]. Also chronic heart failure (CHF) rate and transcendence increases with age. As well as it is an imperative cardiovascular issue foreseen that would augment all through the accompanying 25 years as its recurrence will significantly increment and its power will grow 10 crease from age 60 to age 80 [2, 3]. HF is the main source of hospitalization in individuals more than 65 years [4, 5].

ProBNP is delivered from heart muscle cells, basically in the left ventricular myocardium response to ventricular dilation and pressure overload. Moreover proBNP is split to [B-type natriuretic peptide (BNP1-32 or BNP) and N-terminal proBNP (NT-proBNP)] [6]. Also BNP displays several physiologic functions including vasodilation, advancement of natriuresis and diuresis, inhibition of the sympathetic nervous system and several hormone systems such as the renin-angiotensinaldosterone system, also inhibitory and useful impacts on the physiological mechanisms associate with the cardiovascular system [7]. BNP has a half-life of 22 minutes [8]. For such a serious situation view, the aim

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of this research is to measure the concentration of BNP, hs-CRP and lipid profile in the blood of heart failure patients and healthy people with no heart failure, to compare between them and identify the best agent to diagnose the heart failure disease.

Materials and Method

About 8ml of blood was withdrawn from the participants in the research, the blood was allowed to clot by left it undisturbed at room temperature for 15-30 minutes and the clot was removed by centrifuging at 2200-2500 rpm for 15 minutes in a refrigerated centrifuge. The resulting supernatant is designated serum, the liquid component (serum) was transferred immediately into a clean polypropylene tube by using a Pasteur pipette. The isolated serum was saved at -20°C for subsequent analysis. Elisyys uno was used to measure blood BNP concentration (Abcam’s BNP Human ELISA Kit (ab193694) is an in vitro enzyme-linked immunosorbent assay (ELISA) for the quantitative measurement of Human BNP in serum, plasma and cell culture supernatants), Cobas Integra 400 plus, and Spectrum Spectrophotometer used to measure the other factors.

The number of participants in the research was 110, the males were (57; 52%) and females (53; 48%). The number of patients who took the blood samples was 70 patients, conditional the ejection fraction was 49% or less and they were divided into three groups [group A with an EF % of ≤ 30%, group B with an EF % (31% - 40%) and group C with an EF % (41% - 49%)] and a fourth group D of 40 healthy people with no heart failure.

Results and Discussion

Relationship between BNP and EF %: Table (1), general average in Table (2) and percentage increase in Table (3), when compared with the concentration of BNP in control group D, the difference is clear that there is a significant increase in the concentration of BNP in groups A, B and C for control group D. Also from the above paragraph and Figures (1), (2) and (3) note that BNP is an excellent factor for diagnosing heart failure patients and the relationship between it and EF % is inverse relationship.

Moreover, several studies have been found a strong negative relationship between BNP and EF %[9,10].

Generally, Brain Natriuretic Peptide (BNP) is delivered essentially from the ventricle in light of volume expansion, pressure overload and elevated diastolic pressure [11]. The net impact of these peptides is a decline in blood pressure because of the reduction in systemic vascular resistance and along these lines afterload [12].

As for an ejection fraction (EF %) is typically ascertained by partitioning the volume of blood pumped from the left ventricle per beat, otherwise called stroke volume, healthy individuals typically have ejection fractions between 50% and 65% [13].

<table>
<thead>
<tr>
<th>Search statistics</th>
<th>Group A Mean ± S.E</th>
<th>Group B Mean ± S.E</th>
<th>Group C Mean ± S.E</th>
<th>Group D Mean ± S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total age years</td>
<td>64.82 ± 4.15</td>
<td>66.52 ± 1.87</td>
<td>66.44 ± 2.87</td>
<td>62.60 ± 1.78</td>
</tr>
<tr>
<td>Male age years</td>
<td>63.36 ± 4.36</td>
<td>64.00 ± 2.92</td>
<td>60.77 ± 4.60</td>
<td>61.45 ± 2.44</td>
</tr>
<tr>
<td>Female age years</td>
<td>67.50 ± 9.20</td>
<td>68.86 ± 2.30</td>
<td>72.58 ± 2.42</td>
<td>63.75 ± 2.62</td>
</tr>
<tr>
<td>EF %</td>
<td>27.65 % ± 0.90%</td>
<td>36.10 % ± 0.66%</td>
<td>45.70 % ± 2.83%</td>
<td>---</td>
</tr>
<tr>
<td>BNP pg/mL</td>
<td>846.00 ± 66.02</td>
<td>473.05 ± 34.20</td>
<td>361.10 ± 29.32</td>
<td>93.77 ± 21.48</td>
</tr>
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<td>hs-CRP mg/L</td>
<td>17.44 ± 2.12</td>
<td>12.10 ± 0.80</td>
<td>5.90 ± 0.61</td>
<td>2.77 ± 0.45</td>
</tr>
<tr>
<td>T-Chol mg/dL</td>
<td>185.58 ± 9.72</td>
<td>178.85 ± 11.19</td>
<td>175.10 ± 6.60</td>
<td>162.11 ± 11.80</td>
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<tr>
<td>HDL-C mg/dL</td>
<td>31.23 ± 1.41</td>
<td>34.35 ± 1.12</td>
<td>39.60 ± 1.43</td>
<td>41.00 ± 2.59</td>
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<tr>
<td>TG mg/dL</td>
<td>138.76 ± 12.29</td>
<td>133.95 ± 14.06</td>
<td>132.90 ± 15.32</td>
<td>127.78 ± 12.96</td>
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<tr>
<td>LDL-C mg/dL</td>
<td>126.60 ± 9.19</td>
<td>117.73 ± 9.94</td>
<td>104.92 ± 7.50</td>
<td>95.56 ± 9.25</td>
</tr>
<tr>
<td>VLDL-C mg/dL</td>
<td>27.75 ± 2.64</td>
<td>26.80 ± 2.81</td>
<td>26.58 ± 3.06</td>
<td>25.56 ± 2.59</td>
</tr>
</tbody>
</table>
Table 2: Mean and percentage changes in studied parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean ± S.D.</th>
<th>Percentage increase (Mean)</th>
<th>L.S.D.</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNP pg/mL</td>
<td>560.00 ± 253.89</td>
<td>497.00 %</td>
<td>630.64</td>
<td>0.062</td>
</tr>
<tr>
<td>hs-CRP mg/L</td>
<td>11.81 ± 5.78</td>
<td>332.00 %</td>
<td>14.35</td>
<td>0.071</td>
</tr>
<tr>
<td>T-Chol mg/dL</td>
<td>179.84 ± 5.31</td>
<td>10.90 %</td>
<td>13.19</td>
<td>0.000</td>
</tr>
<tr>
<td>HDL-C mg/dL</td>
<td>35.05 ± 4.23</td>
<td>-14.50 %</td>
<td>10.51</td>
<td>0.005</td>
</tr>
<tr>
<td>TG mg/dL</td>
<td>135.20 ± 3.12</td>
<td>5.77 %</td>
<td>7.76</td>
<td>0.000</td>
</tr>
<tr>
<td>LDL-C mg/dL</td>
<td>117.75 ± 10.90</td>
<td>23.17 %</td>
<td>27.08</td>
<td>0.003</td>
</tr>
<tr>
<td>VLDL-C mg/dL</td>
<td>27.04 ± 0.62</td>
<td>5.73 %</td>
<td>1.54</td>
<td>0.000</td>
</tr>
</tbody>
</table>

- Each value in the table reflects the mean ± Standard deviation.
- For patient with heart failure only.
- The Percentage increase compared with control group D.

Table 3: BNP concentrations and percentage increase for all groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>BNP (Pg/mL) Mean ± S.D</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>846.00 ± 272.21</td>
<td>802 %</td>
</tr>
<tr>
<td>Group B</td>
<td>473.05 ± 152.94</td>
<td>404 %</td>
</tr>
<tr>
<td>Group C</td>
<td>361.10 ± 131.14</td>
<td>285 %</td>
</tr>
<tr>
<td>Group D</td>
<td>93.77 ± 49.35</td>
<td>---</td>
</tr>
<tr>
<td>L.S.D.</td>
<td>496.42</td>
<td>---</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.065</td>
<td>---</td>
</tr>
</tbody>
</table>

- Each value in the table reflects the mean ± Standard deviation.
- The averages with different letters for each factor were significantly different at a probability level of (P≤0.01).

Figure 1: Relationship between BNP, hs-CRP and Lipid profile for all groups as curves.
Relationship between hs-CRP and (BNP, EF %): Table (1), general average in Table (2) and percentage increase in Table (4), when compared with the concentration of hs-CRP in control group D, the difference is clear that there is a significant increase in the concentration of hs-CRP in groups A, B and C for control group D. Wherefore from the above paragraph and Figures (1), (2) and (3) note that hs-CRP is an excellent factor for diagnosing heart failure patients, it has a negative relationship with EF % and a positive relationship with BNP.

Moreover, several studies have been found a strong positive relationship between BNP and hs-CRP\textsuperscript{[14]}, also a negative relationship between hs-CRP and EF\%\textsuperscript{[15]}.

High sensitivity C - reactive protein (Hs-CRP) is synthesized by the liver\textsuperscript{[16]} in response to factors released by macrophages and fat cells (adipocytes)\textsuperscript{[17]}.
Table 4: Hs-CRP concentrations and Percentage increase for all groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>hs-CRP (mg/L)</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± S.D.</td>
<td></td>
</tr>
<tr>
<td>Group A</td>
<td>17.44 ± 8.75</td>
<td>530 %</td>
</tr>
<tr>
<td>Group B</td>
<td>12.10 ± 3.56</td>
<td>337 %</td>
</tr>
<tr>
<td>Group C</td>
<td>5.90 ± 2.74</td>
<td>130 %</td>
</tr>
<tr>
<td>Group D</td>
<td>2.77 ± 1.22</td>
<td>---</td>
</tr>
</tbody>
</table>

L.S.D. 10.40 ---
P-Value 0.061 ---

Legend as in table (3)

Relationship between T-Chol, HDL-cholesterol, TG, LDL-cholesterol, VLDL-cholesterol and (BNP, EF %): Table (1) and General Average in Table (2), when compared with the concentration of lipid profile in control group D, we note a small difference between the groups A, B and C for control group D, this does not give us any evidence or help of diagnose patients with heart failure. From the above section and Figures (1), (2) and (3) we find that the relationship between T-Chol, TG, LDL-cholesterol, VLDL-cholesterol and BNP is a direct and inverse relationship with EF %, And vice versa for HDL-cholesterol.

Furthermore Linssen found a positive relationship between the left ventricular hypertrophy (LVH) and total cholesterol and those results indicate a positive relationship between BNP and total cholesterol [18]. As for total cholesterol is required for some functions for example, to keep up uprightness of cell membranes, creation of vitamin D on the surface of skin and generation of bile acid and steroidal hormones [19].

As well as Qin Zhao found a positive relationship between HDL and EF% [15]. Also high density lipoprotein (HDL) cholesterol is regularly known as the ‘good’ cholesterol, the part of HDL-cholesterol is to transport overabundance cholesterol from the tissues (counting the arterial wall) to the liver for disposal [20].

Moreover, Mona found a positive relationship between BNP with (TG and LDL) [21]. As well as triglycerides are a form of fat and the main molecules that make up animal fats and vegetable oil, they are also a major human skin component of oils (sebum) [22]. Likewise low density lipoprotein (LDL) cholesterol, the conviction that low-density lipoprotein (LDL) cholesterol causes atherosclerosis and resulting coronary illness is a basic statute of current solutions [23].

Very Low Density Lipoprotein (VLDL) cholesterol, elevated amounts of VLDL-cholesterol have been related with the improvement of plaque deposits on artery walls, which limit the entry and confine blood stream [24].

Conclusions

There is a significant increase in the levels of concentrations of BNP and hs-CRP in the blood when the value of EF % decreases, also there is a negative relationship between EF % with (BNP and hs-CRP) and vice versa for BNP and hs-CRP, likewise the relationship between EF % and HDL-cholesterol is a positive and vice versa for BNP and HDL-cholesterol, the amount of decrease in HDL-cholesterol concentration is slightly reduced when the value of EF % decreases, as well as the relationship between EF % and (T-Chol, LDL-cholesterol, TG, VLDL-cholesterol) is a negative relationship, vice versa between them and BNP, where there is a small increase when the value of EF % decreases. From the above and from Figure (3) we conclude that the best diagnostic factors for heart failure patients are BNP and hs-CRP compared to lower value of left ventricular blood pumping (EF %).

Acknowledgment

I would like to thanks all the participants who work with us also the college of science and I would like to extend my sincere thanks to the employees of AL-Hussein Teaching Hospital especially the members of chemistry Laboratory, for their help and support.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCE


A Phylogenetic Study of *Entamoeba Histolytica* Isolated from Patients in the Babylon Hospital of Iraq Based on 18S Ribosomal RNA Gene

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¹Al-Furat AL– Awsat Technical University, Iraq; ²University of Kufa, Iraq; ³Collage of Medicine, Kerbala University, Iraq

**ABSTRACT**

About ten percent of the world’s people are infected with *Entamoeba histolytica*, which representing over fifty million people annually. Sequences of 18S ribosomal RNA gene have been obtained for five new isolates of *Entamoeba histolytica*, which is represented new insights into the evolution of phylogenetic analyses of this parasite in Iraq. In the current study, the phylogenetic relationships between five local isolations of *Entamoeba histolytica* and eight *Entamoeba* spp global isolates were studied by using the 18S rRNA gene sequence.

The analysis of multiple sequence alignment and the adjoining phylogenetic tree analysis was carried out by using ClustalW multiple sequence alignment online based analysis of 355bp 18S rRNA gene was amplified by Polymerase Chain Reaction.

Phylogenetic analysis results of these gene sequences revealed that *Entamoeba histolytica* local isolations were closely related to *Entamoeba histolytica* two Japan isolation (AB282660.1) and (AB485592.1) more than other countries. Accession No: KT253450, KT253451, KT253452, KT253453 and KT253454, these isolates are unique, and a new strain, this is the first report on the usage of molecular phylogeny to classify *Entamoeba histolytica* which is found in Babylon Province of Iraq.

**Keywords:** *Entamoeba histolytica*, phylogenetic tree, Polymerase Chain Reaction, 18S rRNA gene sequence.

**Introduction**

In parasitic diseases, Amoebiasis is the most reason of death After Malaria and Schistosomiasis [1]. Although *Entamoeba histolytica*, *Entamoeba moshkovskii* and *Entamoeba dispar* are morphologically identical but they are biochemically and genetically different [1,2,3].

Over the previous different long time, it has become clear that amoebae appear a highly diverse and polyphyletic aggregation. Other than their form of movement, no phenotypic features unite the group [2,4,5,6]. The illumination of molecular techniques modulating gene signaling and virulence is pay great attention for Scientists working with *Entamoeba histolytica* in order to recognize parasite biology and be able to identify biochemical objects or vaccine applicants that could help to management amoebiasis [7,8].

The information on the host range of any Entamoeba species does not verification, but it is clear that some of them can infect different hosts. *Entamoeba dispar* is separated from a wide diversity of ancient and new world primates as well as humans [9,10].

The features and synonyms of *Entamoeba polecki* are not known because it is originated in pigs and humans. The main criteria of Entamoeba are that many types of morphology level with cyst size and the number of cyst nuclei [11,7].

This illustrates a problem which is increasingly facing molecular information correlation with morphological features. Most similar instances have including ___

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environmental scanning, and no connection to the parasite is usually probable \cite{8}. In addition, in the past qualified primers for the discovery Entamoeba spp. are not specified as previously assumed, which can be demonstrated by the different small sequence in the first areas.

These studies on 18S ribosomal RNA definite that the human pathogenic \textit{Entamoeba histolytica} parasites in several areas of the world and defined their phylogenetic relationship. In addition to that, the case of \textit{E. histolytica} of Iraq remained unclear. The current study was observed and analyzed the small subunit ribosomal RNA genes for production of phylogenetic trees of Iraqi \textit{E. histolytica} parasite in comparison of another species Entamoeba spp. In this study, there are new understandings into the phylogeny of \textit{E. histolytica} provided by the analysis of new Babylon isolation.

**Materials and Method**

Forty \textit{Entamoeba histolytica} isolates were collected from the patient’s fecal samples with gastrointestinal discomfort symptoms referred to the health centers and hospitals in Babylon, in 2017. Then, the samples were sent to the Research Laboratory of Intestinal Protozoa in the Department of Parasitology of Hilla General Teaching Hospital of Medical Sciences for further examination.

**Genomic DNA Extraction Originate:** DNA was extracted from stool samples by using the (Stool DNA Extraction Kit Bioneer-Korea). The components of the kit were prepared and the steps were carried out according to the manufacturer’s instructions.

**Primer Design:** The primer was designed with the service of the Gene bank-NCBI site in order to obtain a complete sequence of the 18S ribosomal RNA gene (Gene bank sequence) by using the program Primer 3plus to design primers which is used in the PCR assay \cite{12}. The Primer has been equipped by the Korean company Bioneer.

**Polymerase Chain Reaction (PCR):** PCR technique was carried out by using a specific primer which was designed by \cite{13}. And Supplied by (company Bioneer. Korea).

**Table 1: Specific primer for detection 18S ribosomal RNA gene**

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence (5 → 3)</th>
<th>PCR product size</th>
</tr>
</thead>
<tbody>
<tr>
<td>18S ribosomal RNA gene</td>
<td>AACCTGCACACGCACCGTCATTAT</td>
<td>355bp</td>
</tr>
<tr>
<td></td>
<td>GGTAATTTACGCGCCTGCTG</td>
<td></td>
</tr>
</tbody>
</table>

The reaction was carried out in (Techne TC-3000 thermocycler. the USA) by setting the following Amplification Protocol table (2)

**Table 2: The program used in PCR thermocycler**

<table>
<thead>
<tr>
<th>PCR Step</th>
<th>Temperature (^{\circ}C)</th>
<th>Time</th>
<th>Repeat cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Denaturtion</td>
<td>95</td>
<td>5 min</td>
<td>1</td>
</tr>
<tr>
<td>Denaturetion</td>
<td>94</td>
<td>5 sec</td>
<td></td>
</tr>
<tr>
<td>Anneling</td>
<td>55</td>
<td>30 sec</td>
<td>30</td>
</tr>
<tr>
<td>Extension</td>
<td>72</td>
<td>30 sec</td>
<td></td>
</tr>
<tr>
<td>Extesion Final</td>
<td>72</td>
<td>7 min</td>
<td>1</td>
</tr>
<tr>
<td>Hold</td>
<td>4</td>
<td>Forever</td>
<td>-</td>
</tr>
</tbody>
</table>

**DNA Technics Sequencing:** DNA sequencing method was done for confirmative detection and a Phylogenetic relationship of \textit{Entamoeba histolytica} which is based on 18SrRNA gene by analyzing Phylogenetic tree using ClustalW multiple sequence alignment programs. The 355bp PCR product has been purified with agarose gel (EZ. EZ-10 Spin Column DNA Gel Extraction Kit, Bio basic, Canada). The purified 18S rRNA gene samples of PCR products were sent to Bioneer Company in Korea for DNA sequencing using 18SrRNA forwarding primers (AB DNA sequencing).

**Results and Discussion**

Out of 40 fecal samples of clinical suspected \textit{Entamoeba histolytica} were tested by conventional PCR assay, only thirty samples were appeared positive for \textit{Entamoeba histolytica} at 355 bp PCR product of 18S rRNA gene on 1.5% agarose gel electrophoresis (2h., 5V/cm, 1XTris-acetic buffer).

The five positive samples Sequence analysis of \textit{Entamoeba histolytica} was performed to confirm the PCR results. These sequences of the 18S ribosomal RNA genes of the parasite can be found under the accession numbers: KT253450, KT253451, KT253452, KT253453 and KT253454 at NCBI-Gen Bank submission.
Analysis of DNA sequencing of the 18S rRNA gene 355 bp PCR product by multiple alignment (ClustalW2) showed specific detection of *E. histolytica*, the results of Phylogenetic sequence alignment of (*E. histolytica* local Iraqi isolation) was 100% identity to *E. histolytica* strain (KF429800.1) more than other Entamoeba spp.

The phylogenetic tree was constructed based on five *E. histolytica* Iraq isolation, eight Entamoeba spp and out group sequences including *Entamoeba ecuadoriensis*

The identity percent of *E. histolytica* Iraq local isolates to other *E. histolytica* AB282660.1 (Japan), KJ870211 (Cameroon), Y11272.1 (India), GQ423749.1 (Philippine) was 100% and with *Entamoeba nuttalli* (AB485592.1), were 99%, Table(3):

Table 3: Homology sequence identity of local *E. histolytica* isolate to NCBI-Genbank Entamoeba isolation

<table>
<thead>
<tr>
<th>Accession No.</th>
<th>Country</th>
<th>Name of Sequences</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Max score</td>
<td>Identity</td>
<td>Max score</td>
<td>Identity</td>
<td>Max score</td>
</tr>
<tr>
<td>AB282660.1</td>
<td>Japan</td>
<td>E.histolytica</td>
<td>623</td>
<td>100%</td>
<td>654</td>
<td>100%</td>
<td>651</td>
</tr>
<tr>
<td>AB485592.1</td>
<td>Japan</td>
<td>E. nuttalli</td>
<td>590</td>
<td>99%</td>
<td>643</td>
<td>99%</td>
<td>640</td>
</tr>
<tr>
<td>AB282661.1</td>
<td>Japan</td>
<td>E. dispar</td>
<td>534</td>
<td>98%</td>
<td>610</td>
<td>98%</td>
<td>606</td>
</tr>
<tr>
<td>DQ286373.1</td>
<td>England</td>
<td>E.ecuadoriensis</td>
<td>484</td>
<td>95%</td>
<td>555</td>
<td>95%</td>
<td>551</td>
</tr>
<tr>
<td>AF149906.1</td>
<td>USA</td>
<td>E.moshkovskii</td>
<td>351</td>
<td>92%</td>
<td>505</td>
<td>92%</td>
<td>501</td>
</tr>
<tr>
<td>FN666250.1</td>
<td>Denmark</td>
<td>E. bovis</td>
<td>311</td>
<td>85%</td>
<td>372</td>
<td>86%</td>
<td>368</td>
</tr>
<tr>
<td>AF149907.1</td>
<td>USA</td>
<td>E. hartmanni</td>
<td>270</td>
<td>83%</td>
<td>331</td>
<td>84%</td>
<td>327</td>
</tr>
<tr>
<td>DQ286371.1</td>
<td>England</td>
<td>E. equi</td>
<td>623</td>
<td>81%</td>
<td>291</td>
<td>82%</td>
<td>287</td>
</tr>
</tbody>
</table>

The 18S ribosomal RNA gene is the most abundant component of nucleic acid with a eukaryotic RNA transcription unit in any parasitic organism. The sequenced rRNA gene was study from a diversity of various organisms and leading to a large sequence comparison database [8,10]. Moreover, the 18S rRNA gene is valuable for phylogenetic analysis due to its high levels of conservation [14,10].

In the Illustrate Entamoeba spp relationships. Parasites which show their previous classification of taxonomy was not clear. Molecular manners such as sequencing 18S rRNA gene described in this study are promising tools to classify this parasite.

For a clearer taxonomic description of *Entamoeba histolytica* parasite, however, basic information based on life-cycle variations, methods of transmission, virulence and genetic compatibility is essential [15,10].

Designing tree of phylogenetic based on sequencing the 18S rRNA gene of the Iraq isolation (*Entamoeba histolytica*), and other species of Entamoeba available in GenBank *E.histolytica* (Iraq isolation) was near to *E.histolytica* (AB282660.1).

In the constructed tree which is depended on available two Entamoeba spp are pathogens, but the others organism in this paper are either free-living or commensal. *Entamoeba histolytica* is the cause of the human amoebic dysentery but *Entamoeba invadens* source fatal infections in some reptiles. Both of these pathogenic species are memberships of distinguished well-supported clades [15,16].

Our trees yield no guide of coevolution between *Entamoeba histolytica* and their hosts. Species from
primates and mammalian sources are scattered in our phylogeny, which suggests that host switching has been a common event in this lineage [16]

Furthermore, more than one host can infect by *Entamoeba histolytica*, which causes a problem in diagnosis and epidemiology. In this study, the fragment of 18S rRNA gene sequences of *Entamoeba histolytica* 355bp was amplified to examine.

The data nucleotide sequence identity demonstrated that the five *Entamoeba histolytica* Iraq isolation are nucleotide identity percent of 100% with *E. histolytica* (AB282660.1 japan) and with *Entamoeba nuttalli* (AB485592.1japan) was 99%, *Entamoeba dispar* (AB282661.1) was 98%. Outcome, significant genetic diversity is present among morphologically different parasites, and it is also probable that exact morphological variations do not influence species-level [15,17,18], but it is evident that some Entamoeba can infect diverse hosts.

Other aspects of the parasite population genetics have been classified, such as population substructure, geographical and host recognition, and chosen and propagation of genetic lineages, all of them must be studied together.

**Conclusion**

Our understanding of *E. histolytica* pathogenesis at both the molecular and DNA sequencing level, as well as its ability to transmit, adapt to diverse conditions, overcome host barriers and emerge as infective trophozoites, will provide targets for therapeutic interventions.

**Recommendation**

More study to detection other aspects of the *Entamoeba histolytica* population genetics.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Histological Effect of the Alcoholic Extract of *Nerium Oleander* in the Heart and Brain in Mice and its Effect on the Lymphocytes (*In Vitro*)

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¹Department of Pathological Analysis, ²Applied Chemistry Department, College of Applied Sciences, University of Samarra, Iraq

ABSTRACT

The study consisted of two axes: 1 - Knowledge of the toxic effect of leaf extract *N. oleander* on the histology of the heart and brain of the extract of the leaves in mice.

The plant was extracted with alcohol and the specific chemical data were calculated and the detection of some plant compounds by analytical methods. The animals were then divided into four groups. The first group was the control group, which were vaccinated with distilled water and the second group pumped the extract at a low concentration 1mg/ml and the third group dose extractor. The concentration 1.5mg/ml and the fourth group were pumped with a concentration extract of 2mg/ml. The results of the examination of the tissue of the heart for all groups for month and, edema with spasticity in the muscle cells, and fragmentation and infiltration of the cells of single-nuclei in the heart muscle. We conclude that the extract of the leaves has a toxic effect on the heart muscle. After a month of the dosage, focal necrosis was observed and in other samples of the brain samples were seen infiltration For the inflammatory cells of the nuclei and lymphocytes around volatile regions. 2- the second axis to know the effect of the extract on lymphocytes by studying extracellular (*in vitro*), The results of the *N. oleander* highly inhibitory effect on human lymphocyte mentioned.

**Keywords:** *N. oleander*, Brain, Heart

Introduction

*N. oleander* is one of the most important medicinal plants since ancient times. Despite its high toxicity, about 10 leaves are sufficient to kill a horse and 8 leaves of cow killing. However, humans were able to benefit from this quality in the treatment of many diseases.

The Arabs were the first to discover the therapeutic ability of this plant against cancer and skin tumors as well as in the treatment of back pain and joints (¹). In addition to other compounds such as Oleandrinigenin, gentiosylolandrin, Diginose, and Digitose, they are not medically active. The leaves contain glycosides and digitoxigenin (²). A recent study also found that oleander was used in the treatment of hyperglycemia and high blood pressure (³). A recent study has concluded that oleander flower extract protects nerves and nerve cells from damage (⁴).

Materials and Method

**Extraction of *N. oleander***: The extract was prepared with 20 g of dried leaves powder and was dried by spreading green leaves on a floor covered with clean leaves, while stirring them daily in a dark place with good ventilation and then dissolved in 200 ml of 95% ethyl alcohol. Well and leave it for 24 hours after the mixture was sprayed through several layers of gauze and take the leachate produced in Soxhlet extractor (which works on the basis of vaporization under pressure and temperature not more than (45) m, After evaporation of all the alcohol in the mix was dried to obtain dry matter With dark green color and softened with distilled water Harm the required dose (⁵).
Chemical detection of some active substances found in Samples of the leafy plant:

1. Detection of alkaloids: 10 g of plant sample was boiled in 50 ml of distilled water with 40% hydrochloric acid. The solution was then filtered after cooling. 0.5 mL of leachate was tested in a test tube with the following reagents:

<table>
<thead>
<tr>
<th>Tube</th>
<th>0.5 ml of the detector</th>
<th>The color of the precipitation that</th>
<th>Purpose of detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Dragandrov</td>
<td>orange</td>
<td>alkaloids</td>
</tr>
<tr>
<td>Second</td>
<td>Meyer</td>
<td>white</td>
<td>Quaternary alkaloids</td>
</tr>
<tr>
<td>Third</td>
<td>Waknar</td>
<td>brown</td>
<td>alkaloids</td>
</tr>
</tbody>
</table>

2. Detection of Glycosides: Mix two equal parts of the flank detector with the plant extracts and then leave the mixture in boiling water bath for 10 minutes and indicate the positive examination through the emergence of red deposit is a proof of the presence of sugars. To confirm this result was added 1 ml of plant extract to 5 ml of Benedict detector Where the appearance of brown color on the presence of sugars.

3. Detection of flavones: The first solution was to dissolve 1 g of plant sample in 5 ml of 95% ethyl alcohol, then the solution was filtered after 6 hours. The second solution was to add 10 ml of ethyl alcohol at 50% to 10 mL of 50% potassium hydroxide solution. Mix equal amounts of the above and yellow color, indicating the presence of flavones.

Laboratory Animals: In this study 16 mice from Swiss white mice were used, ranging from 25 to 28 g. Obtained from Pharmacology Department/General Pharmaceutical Company for General Industries.

Group Design: The animals were randomly divided into four groups in plastic cages. Each cage contained four mice, treated as follows:

The First Group: Control group: consists of 4 mice, normal saline solution, 0.1 mg/ml.

The second, third, and fourth groups were reintroduced at a concentration of (1), (1.5) and (2), respectively, for a period of one month on a daily basis. The dose was determined according to the weight/ml/kg ratio of body weight.

Preparation of tissue sections: After dissecting the animals and placing (heart and brain) in the Formalin 10% solution, the samples to be studied were converted to ethyl alcohol at 70% concentration. The following steps were taken:

- a- Dehydration, b- Clearing, c- Infiltration, d- Embedding, e- Sectioning, f- Staining, g- Mounting.

Preparation of the extract to study its effect on lymphocytes

Preparation of Concentrations: The amount of powdered extract was oleander 0.8 g (8% of the original weight).

The following concentrations were prepared immediately prior to the experiment. N. oleander concentrations were prepared by thawing 1 g powdered powder in 10 mL of serotonin medium and concentrations (150, 75, 37, 18, 9.35, 4.68, 2.34, 1.17) were prepared. These concentrations are prepared before use.

Lymph Node: Lymphocytes were obtained from the blood of people with liver cancer. The lymphocytes were examined for each of the different total white blood cells and the lymphocytes were separated by Neutral Red.

The effect of cellular toxicity of the purified N. oleander extract extracted from the N. oleander on cell line was assessed by assessing its effect on the HEPG2 cell line (lane 18) at the time of exposure for 48 hours at different concentrations of N. oleander extract (150.0, 75.0, 37.5) 18.75, 9.37, 4.68, 2.34, and 1.17 μg/ml) using the neutral red test. The optical density measured in transmission wavelength is 450nm and 492 nm.

The neutral red assay is a cell survival test/viability based on the ability of viable cells to integrate and bind a neutral red dye. The neutral red absorption test provides one of the most commonly used cytology tests with many biomedical and environmental applications. Therefore, he was selected to determine cellular toxicity.

After exposure, cells are incubated in a neutral red dye. The dye easily penetrates cell membranes and accumulates intracellularly into the lysosomes. Neutral red is also a vital stain, and has been used to
color live cells. Cell changes resulting from the action of the purified *N. oleander* extract cause a reduction in the absorption of Red Neutral. After washing the cells with PBS and treating them with an alleged solution to release any increase in the dye taken, the cell damage was evaluated by measuring the visual density of the treated cell solution and comparing it with the untreated negative control samples. Microtiter panel reader equipped with 450 and 492 nm filter.

**Results and Discussion**

**Table 2:** Chemical detection of active substances in *N. oleander* extracts studied

<table>
<thead>
<tr>
<th>Active substances</th>
<th>Leaves of the plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycosides</td>
<td>+</td>
</tr>
<tr>
<td>Alkaloids</td>
<td>+</td>
</tr>
<tr>
<td>Flavones</td>
<td>+</td>
</tr>
</tbody>
</table>

Through table (1) it can be concluded that contain alkaloids and glycoside and it can be determined by HPLC (9).

**Histological sections of the heart and brain**

**Fig. 1:** Heart, Group H1 shows: 1 - congestion 2 - decomposed nuclei, H&E(400X)

**Fig. 2:** Heart, Group H3 shows: 1 - blood congestion in the blood vessel 2 - muscular heart muscle inflated. 3 - decomposed nuclei 4 - explode in the fibers of the heart muscle, H&E(400X)

**Fig. 3:** Brain, Group B3 shows: 1. bloody congestion 2. decomposing nerve cells, H&E(400X)

**Effect of the extract on the histological lines of the heart and brain**

**Heart:** The current study revealed acute myocardial infarction from the beginning of the treatment of the follicle and may indicate these plants to toxic effects on the heart muscle. Which lead to disturbance in the cellular ions pump associated with an increase in intracellular fluid accumulation. may lead to fibrillation and death. These were consistent with (10) who showed that these plants contain cardiac glycosides, which can cause direct poisoning of the sodium and potassium pump in the myocardium and the occurrence of vagotonia associated with heart failure. Changes in the current study of the myocardium that appeared in the post-dose phase. These observations were consistent with (11) who showed that these plants occur changes in the heart and digestive system after four hours of plant oleander.

These results may indicate that the toxic effects of these plants have been progressive over time due to the accumulation of large quantities Heart glycoside (12). The occurrence of myocardial infarction with the inflammatory cell sequence may be that these instruments were consistent with (13). While the road (10) that this plant carries very toxic substances to animals because of their heart-hearted content. The observed infiltration of neutrophils and necrosis of the myocardial fibers may indicate that these extracts cause toxic stress, which is associated with the production of pro-inflammatory cytokines such as TNF alpha that attract neutrophils to the site of tissue damage. This guide was agreed with note (13) that the release of free radicals plays an important role in degenerative and necrotic changes. Also, (14) proved that the toxic effects of extracting leaves of the plant can be activated by the production of free radicals that cause tissue damage,
The Brain: After a month of the dosage, focal necrosis was observed and in other samples of the brain samples were seen infiltration For the inflammatory cells of the nuclei and lymphocytes around volatile regions.

If these changes continue for a long period, causing necrosis or death of the neuronal cell, the cause may be attributed to it, as well as lack of food and oxygen resulting from irritation in the vessels. The necrosis of the brain cells and tissues may be due to the presence of proteins in the blood cells of the egg, especially the neutrophils, which are more likely to leak in response to inflammatory reactions in the tissue. Some immune reactions may also cause necrosis and death of nearby cells. Reaction by the cytokines separated by macrophages and Monocytes nucleus.

As for the deposition of hemoglobin in the brain tissue, as seen in the present study, which is attributed to the increase in red blood cell decomposition and its local presence, the tissue has suffered from local hemorrhage as the macrophages at hemorrhage sites ingest the red blood cells (15).

Results of the effect of the extract on extracellular lymphocytes: On the other hand, results indicated in table (3) showed that cell survivals (%) of human lymphocyte measured at 450 nm after 48 hour of treatments with N. oleander extract reaches the maximum reduction (72.0%) after treatment with N. oleander extract at a concentration of 4.68 µg/ml, while the remaining activity of tumor cells was 71.6% at concentration 37.5 µg/ml. Activity of N. oleander extract was determined in cell suspension of human lymphocyte after the treatment with N. oleander extract at concentration 75 µg/ml for 48 hours of incubation. According to these results, the concentration 75 mg/ml of N. oleander extract was selected due to its highly inhibitory effect on human lymphocyte (39%).

<table>
<thead>
<tr>
<th>N. oleander extract concentration (µg/ml)</th>
<th>Remaining activity of cells (%)</th>
<th>Cell survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>75.7</td>
<td>74.5</td>
</tr>
<tr>
<td>75</td>
<td>65.6</td>
<td>76.1</td>
</tr>
</tbody>
</table>

The immune system is affected by the immunological parameters of stress in humans and animals, such as white blood cell toxicity, natural killer cell activity, leukocyte distribution, cytokine production, pharyngeal maturation, yeast activity and lymphopenia. The aim of this study was to investigate N. oleander for acute cytotoxicity in the laboratory on lymphocytes of human peripheral blood. As the approach to reducing the number of lymphocytes leads to the opening of a place to treat many deadly diseases such as leukemia and other diseases associated with blood. On the other hand, when normal lymphocytes attack by any active compound can lead to apoptosis, excess lymphocytes can increase from Bcl-2 known as antiapoptotic protein, Also, lymphocytes when exposed to an active compound (the internal toxin model) can prevent apoptosis by activation (16).

Conclusion

The extract of the leaves has a toxic effect on the heart muscle. After a month of the dosage, focal necrosis was observed and in other samples of the brain samples were seen infiltration For the inflammatory cells of the nuclei and lymphocytes around volatile regions. 2- the second axis to know the effect of the extract on lymphocytes by studying extracellular (in vitro), The results of the N. oleander highly inhibitory effect on human lymphocyte mentioned.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding
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1. Erdemoglu, N; Kupeli, E. And Yesilada, E. Anti - Inflammatory And Antinociceptive Activity Assament Of Plants Used As Remedy In Turkish Folk Medicine. 1: J. Ethnopharmacol 2003, 89 (1) : 123 -129.


The Impact of the Learning Strategy by Means of Aids to Develop the Spike Performance from Rear Area for Students

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¹The College of Physical Education and Sports Sciences, University of Babylon, Iraq

ABSTRACT

The learning strategy is learning, for understanding or meaning-based learning, by linking the learner’s past experiences with his or her subsequent experiences, the formation of links and relationships between them, and learning through generational processes used to modify alternative perceptions and concepts in the light of the correct scientific knowledge. As well as to recognize the impact of the learning strategy of birth by helping to develop and perform spikes from the rear area for students.

The researcher followed the experimental approach by designing the two parallel groups with the pre and posttests, and on the main research sample of (28) students of the third stage in the Faculty of Physical Education and Sports Sciences- Babylon University for the academic year (2017-2018). The sample was divided into two groups, (14) students per group. The experimental group followed the work of the obstetric learning strategy by means of assistance, while the control group followed the curriculum of the teacher of the material.

Keywords: learning strategy, aids and rear area.

Introduction

The learning strategy is one of modern learning strategies. It is both a learning and a learning method. Students engage in activities and exercises very effectively by linking the learner’s past experiences with his or her subsequent experiences, and learning through generating processes is used to modify alternative perceptions and concepts In the light of proper scientific knowledge. It also helps to remember and speed learning or training and install it, and works to take into account individual differences between learners.

Through the follow-up of the researcher and his observations of most of the educational units for students of this stage, noted a lack of clear in the performance of basic skills, especially the skill of spike overwhelming and the adoption of its performance in a simplified form without taking multiple forms that may be exposed to the learner during the game play, we find weak in dealing with these forms of skill spike overwhelming Especially the spikes of the rear area. In light of this, the researcher suggested introducing the obstetric learning strategy by means of assisting in the development of the spike of the from rear area for students.

The game of volleyball is based on basic skills as an important base for upgrading skill level. The learning of basic skills is the most difficult but necessary stage to achieve optimum performance. The importance of research is the importance of the aspect that addresses its study. Contribute to the development of the spike of the volleyball rear area, as well as to help the existing educational process in the faculties and departments of physical education and sports science in the transfer of various tasks or educational tasks and delivery to the learner to develop the skill of spike Overwhelming area of the rear and mastery, which may help him interact positively with the learning environment.

Research Aim: Identify the impact of the learning strategy by means of aids in performing spike from rear area for students.

Research Hypothesis: Strategy generative learning means helping a positive influence in the development of spike from the rear area volleyball for students.

Research methodology and field procedures

Research Methodology: The researcher followed the experimental method of designing the two groups with pre-pre and post-test to suit the nature of the research
Research Community: The research community determines the students of the third stage in the Faculty of Physical Education and Sports Sciences at the University of Babylon for the academic year (2017-2018) of (154) students.

Sample design tests the accuracy of some of the overwhelming batches: The sample consisted of (30) students. They were randomly selected from the homogeneous research community who did not participate in the main research sample, and constituted a percentage of (19.48%).

Main research sample: The main sample of the sample (28) was randomly selected by the lottery method. The experimental group consisted of 14 students. The experimental group is considering the learning strategy and the control group is studying the teacher’s approach. Thus, the main research sample represented 18.18% of the research community, which is a good percentage of the representation of the society in real and real representation.

Sampling homogeneity: The researchers conducted homogeneity of the research sample in the variables of total length, age and mass, as shown in table (1).

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Mean</th>
<th>SD</th>
<th>Mode</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>Year</td>
<td>21.25</td>
<td>0.67</td>
<td>21</td>
<td>0.37</td>
</tr>
<tr>
<td>2</td>
<td>Length</td>
<td>Cm</td>
<td>171</td>
<td>3.11</td>
<td>170</td>
<td>0.32</td>
</tr>
<tr>
<td>3</td>
<td>Weight</td>
<td>Kg</td>
<td>66.34</td>
<td>1.52</td>
<td>65</td>
<td>0.88</td>
</tr>
</tbody>
</table>

Equal two sets Search: To start with a single stroke, the researcher compared the control and experimental groups in the pretests to perform the volleying of the volleyball rear area, as shown in table (2).

<table>
<thead>
<tr>
<th>S.</th>
<th>Variables</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The technical performance of the spike of the back line</td>
<td>Grade</td>
<td>4.34</td>
<td>4.61</td>
<td>1.14</td>
<td>Non sig.</td>
</tr>
<tr>
<td>2</td>
<td>Accuracy spike performance of the back line</td>
<td>Grade</td>
<td>9.41</td>
<td>9.79</td>
<td>1.13</td>
<td>Non sig.</td>
</tr>
</tbody>
</table>

At the level (0.05) and the degree of freedom (26) is smaller than Tabulated value (2.06).

Research Method

The researcher used the following research tools:
- References and Arab and foreign sources.
- Observation.
- The resolution.
- Interviews.
- Tests.

Used tools and devices: The researchers used the following tools and devices:
- A legal volleyball court with its accessories.
- Aircraft balls legal number (15).

Field Research Procedures:

Determination of the rear spike test in the volleyball: To select the technical performance tests for some form of volleyball, the researchers relied on the virtual construction of these skill forms (the preparatory section, the main section, the closing section), and a special questionnaire was prepared containing a set of divisions concerning technical performance evaluation. The plane was presented to a group of experts and specialists to choose the appropriate division to evaluate the technical performance. After collecting the questionnaires, the results were based on the percentages of the agreement of the experts and specialists who were presented with the questionnaire.

To calculate the discriminative ability of the tests, the researcher applied these tests to a sample of the research community (the design sample) of (30) students.
Table 3: Shows mean, standard deviations, loops, torsion and standard errors to extract the coefficient of difficulty to select the accuracy of the crushing performance of the volleyball rear area

<table>
<thead>
<tr>
<th>Tests</th>
<th>Mean</th>
<th>SD</th>
<th>Mode</th>
<th>Skewness</th>
<th>Standard error</th>
<th>Nature of distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy spike performance of the back line</td>
<td>12.84</td>
<td>0.92</td>
<td>12</td>
<td>0.91</td>
<td>0.17</td>
<td>Closer to the moderate</td>
</tr>
</tbody>
</table>

Characterization of tests:

Test the spike of the back line:

Test Name: Test the technical performance of the spike of the back line of the students.

Objective of the test: Measuring the technical performance of the crushing blow of the back line.

Tools used: Legal volleyball court, legal airplane balls (3), a camera with drugs, pre-prepared evaluation form.

Performance specifications: The student in the lab (6) and the spike of the crushing from the back line, the student is given laboratory (3) consecutive attempts.

Total score of the test: (10) degrees. - Test the accuracy of the crushing performance of the back line:

Test Name: The accuracy of the crushing spike performance of the back line of center (6).

Purpose of the test: Measure the accuracy of the crushing performance of the back line.

Tools used: Legal volleyball court, legal plane balls (5), pre-prepared assessment form.

(3) prepares the next ball to the student in the center (6), which blows the crushing of the back line and the performance of crushing blows towards the three areas (C, B), (A) and painted in the middle of the defensive zone rear dimensions of each area (1 m × 2 m).

Total score of the test: (18) degrees.

Main experience:

Pretests: Pretests of the technical performance were conducted by the spike of the volleyball rear of the members of the research sample (the control and experimental groups) on 6/11/2018 at 10:00 am at the outdoor volleyball court at the Faculty of Physical Education and Sports Sciences - Babylon University.

Experimental group (experimental and control groups) were conducted on 7/11/2018 at 10:00 am at the outdoor volleyball court at the Faculty of Physical Education and Sports Sciences - Babylon University.

Implement the vocabulary of the learning strategy by means of aids: After reading the many references and sources, the researcher prepared the vocabulary of the learning strategy by means of assistance, and after consultation with the supervisors to choose the most methods, methods and methods affect the variables of the target in the main experiment, and the implementation of the vocabulary as follows:

1. The implementation of the vocabulary of the learning strategy by means of aids on 12/11/2018 during the educational units, and in part of the main section only, on Monday and Wednesday of each week, at the outdoor volleyball court in the Faculty of Physical Education and Sports Sciences - University of Babylon.

2. The duration of the total implementation (6) weeks. The number of units per week (2) units. And the total number of training units (12) units. The training module (90) minutes.

3. Assistive measures have been developed that have developed the spike of the volleyball rear.

4. Follow the students of the control group in the development of the perception of the spike of the volleyball rear area, the educational method followed by the teacher of the article same, and the number of educational units themselves and the time of the unit as well.

Posttests: Pretests for the technical performance were carried out by the spike of the volleyball rear of the members of the research sample (the control and experimental groups) on 24/12/2018 at 10:00 am at the outdoor volleyball court at the Faculty of Physical Education and Sports Sciences - Babylon University. Pretests of the spike accuracy of the volleyball team were conducted on 25/12/2018 at 10:00 am at the outdoor volleyball court at the Faculty of Physical Education and Sports Sciences, Babel University.
Results

View the results of the differences between the pre and posttests of the spike of the volleyball rear of the control group and analyze them:

Table 4: Shows the mean, the standard deviations and the t values calculated between the pre and posttests of the striking strike from the volleyball rear of the control group

<table>
<thead>
<tr>
<th>Tests</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technical performance of the spike of the back line</td>
<td>Grade</td>
<td>Mean 4.34 SD 0.58</td>
<td>Mean 5.41 SD 0.69</td>
<td>3.74</td>
<td>Sig.</td>
</tr>
<tr>
<td>Accuracy spike performance of the back line</td>
<td>Grade</td>
<td>Mean 9.41 SD 0.87</td>
<td>Mean 12.98 SD 0.72</td>
<td>3.87</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

All calculated values (t) were greater than their tabular value of (2.16) below the level of significance (0.05) and the degree of freedom (13).

View the results of the differences between the pre and posttests of the spike of the experimental group’s volleyball rear area and analyze them:

Table 5: Shows the mean, the standard deviations and the value t calculated between the pre and posttests of the crushing multiplication of the volleyball rear area of the experimental group

<table>
<thead>
<tr>
<th>Tests</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technical performance of the spike of the back line</td>
<td>Grade</td>
<td>Mean 4.61 SD 0.62</td>
<td>Mean 6.87 SD 0.53</td>
<td>4.76</td>
<td>Sig.</td>
</tr>
<tr>
<td>Accuracy spike performance of the back line</td>
<td>Grade</td>
<td>Mean 9.79 SD 0.84</td>
<td>Mean 15.44 SD 0.69</td>
<td>5.61</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

All calculated values (t) were greater than their tabular value of (2.16) below the level of significance (0.05) and the degree of freedom (13).

View the results of the differences in the post tests to perform the spike of the volleyball rear area between the control and experimental groups and analyze:

Table 6: Shows mean, the standard deviations and the value (t) calculated in the post tests to perform the overwhelming strike of the volleyball rear area between the control and experimental groups

<table>
<thead>
<tr>
<th>Tests</th>
<th>Units</th>
<th>Control group</th>
<th>Experimental group</th>
<th>(t) value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technical performance of the spike of the back line</td>
<td>Grade</td>
<td>Mean 5.41 SD 0.69</td>
<td>Mean 6.87 SD 0.53</td>
<td>6.05</td>
<td>Sig.</td>
</tr>
<tr>
<td>Accuracy spike performance of the back line</td>
<td>Grade</td>
<td>Mean 12.98 SD 0.72</td>
<td>Mean 15.44 SD 0.69</td>
<td>8.89</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

All calculated values (t) were greater than their tabular value of (2.06) below the level of significance (0.05) and at the degree of freedom (26), indicating significant differences in the post tests between the control and experimental groups.
Discussions

The researchers point out that the results of differences in post-tests and the superiority of the experimental group in all variables to the strategy of learning by means of aids contributed to increase the ability of students to generate ideas and this was evident in the development of mental perception by linking the relations between concepts and what they have reached. This is what has been achieved in the main section of the educational unit, especially in the educational part. The group adopted a number of aids: data sheets, illustrations and educational booklet, which helped them to create the correct images of skill performance, this helped to give students the opportunity to modify their previous concepts and acquire new concepts.

These methods were designed and selected on scientific bases that suit the students’ abilities, tendencies and desires, as well as attracting their attention and linking their previous information with the new information. The result of the interaction between what he learns and his current ideas, and this is what is indicated in the students that “students come to the classroom and possess some of the prior knowledge and misconceptions and the most influential and most important factor is what students already know within the learning strategy Molding.

The follow-up of the experimental group members and the use of a range of auxiliary means for use in the course of the exercise of the skills, “There are several ways to motivate the learner towards the effectiveness of the game to learn and practice her skills. These methods are to facilitate the learning opportunities of the motor and the clarity of the appropriate goal to learn and develop the skill, as well as balance to satisfy the needs of the learner, because motivation is a necessary condition for learning, as the learner’s motivation is stronger as he approaches the good performance that does not require much effort and time, which is confirmed in the “The number of attempts with the use of tools, which increased the enthusiasm and motivation of the students, which reflected on the development of the performance of spike from the rear area Volleyball and various places of the stadium, supported by continuous encouragement of the teacher of the material and this is consistent with what was mentioned in the “commitment and encouragement and diversification in performance helps to learn or acquire skills.

Conclusions

The technical design has been designed to test the accuracy and spike of the volleyball rear area of the students. For the learning strategy of birth by means of helping a large role in the development of the spike performance of the area of the rear volleyball students.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors have no conflict of interest.

Source of Funding: Self-funding

REFERENCES
The Effect of Relative Muscle Speed Exercises and Absolute Improvement of Some Receipt Parameters, Delivery and Achievement 4 × 100 Meters Relay for Youth

Sadeq Abdul Ridha Atiayah¹, Hussein Mardan Omer¹

¹The College of Physical Education and Sport Sciences, University of Al-Qadisiyah, Iraq

ABSTRACT

That the real race (4 ×100) meter is to cut the distance in the minimum possible time for a team of four runners, which requires, Players Selection on according to the converging times that the tests indicate Private run linked to the relative speed of the Players and the extent of their convergence and this is one of the most important problems that has not been studied previously, applied to a sample of the players of the Olympic champion project in Alnajaf-Al Shraf And with the number of (8) contestants, the researchers conducted the relative velocity tests and specified the time tests of the switch area kidney and speed of the Muslim player and the recipient and the place of switching as dependent variables is affected by The quality of the proposed exercises, and they found that this exercises based on relative speed has achieved the aim of developing variables for the switching area.

Keywords: Drills, Parameters delivered and achievement.

Introduction

Many mechanical laws have entered into field applications for sports training, which require the conduct of field experiments in accordance with the correct scientific basis in order to be successful choice of the type of the appropriate player in the specific competition, especially in the race for individual games and from them Ran (4 × 100 m) relay as it is known that there is a discrepancy in the time of the distances for each player during the total distance of the race and that the time of cutting these distances depends on the ability of the player to accelerate high speed and maintain the maximum velocity (regular speed) and the amount of speed tolerance in the last meters in each Distance. This means that the player must be efficient according to the abilities of the recipient so that the process of receipt and delivery on high accuracy and one speed between both players with the minimum time possible during the switching area, and at high accuracy, so the knowledge of each player’s level and the abilities of a positive acceleration and regular acceleration and The relative speed between both the contestants has become a necessity for the matching players to be identified with capabilities to ensure that the temporal and spatial field is matched at the moment of receipt and delivery and to achieve the minimum time possible and thus achieve high achievement.

The relative velocity is one of the types that the players should be distinguished from and this type of velocity has to do with the velocity of an object relative to another body that has changed motion taking into consideration the direction of each body’s velocity, and the Law (First body speed - Second body speed).

Therefore, the importance of this research is to demonstrate the importance of relying on the relative velocity index in determining the sequence of the contestants and conducting the tests and their measurements and their impact in reducing the instantaneous times when delivering and receiving, and controlling the appropriate distance in which delivery is made and delivered in order to achieve the achievement that The real goal of this contest is.

In addition, this effectiveness is and up to 110 m hurdles) in order to form a team (4 × 100)meter relay and define the period pre-competitions for the purpose of training on receipt and delivery without considering
the relative speed between the contestants which is the real standard to suit the speed. The recipient player with the speed of the Muslim player and the possibility of discovering the value of this relative speed through special tests to determine the right player in his abilities which delivers the stick with the abilities of the player who receives the stick and this is one of the scientific problems that were not studied previously for this contest as the researchers wanted to go into To develop scientific solutions and to improve the level of achievement (4 × 100) meter. Continue to note that the level of Iraq in this competition still requires many studies that contribute to the development of this competition. Therefore, the aim of the research is to recognize the time (30 m) of the delivery distance and the handover of stability and movement. To recognize the total time of the delivery and receiving area, and learn about the impact of the exercises in the development of the spatial and temporal areas of delivery, handover, completion and determination of the sequence of contestants and speed Relative.  

<table>
<thead>
<tr>
<th>Table 1: Sample specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>1. Age</td>
</tr>
<tr>
<td>2. Length</td>
</tr>
<tr>
<td>3. Mass (Kg)</td>
</tr>
<tr>
<td>4. Age Training</td>
</tr>
</tbody>
</table>

**Society and the research sample:** The sample search is composed of (8) of runners Allocated Arcad Short (100 m- 200 m- 400 m- 110 m) (Under 20 years) table (1) sets out their specifications been used Cameras camera Number/3 speed (120) image/Second type (Sony) and different measuring instruments, and he Researchers That filming Ran 4 × 100 m relay Sample Search With three video cameras fixed from the inside of the jogging fields and perpendicular On the three receiving and delivery areas Dimensions allow coverage of the area of the switch area (the attachment is noted). To perform the analysis and extraction of receipt and delivery distance variables and their times. The two researchers then conducted Test Run (30 m) from Stand Mode the first 30 meters from the distance of each rider and the last 30 meters for the same racer. Within the race distances. Measure the running time in the three switch area and determine the control mark.

Was By conducting tribal tests In The period from 14-16/2/2018, and using physics training interval high intensity during the special preparation period, and the reality (30 -40 minutes)- Within the main section of the training curriculum for the search sample, Dish Joint Jogging Drills Between players In order to promote the principle of relative speed Including Commensurate with the capacity of each individual, Applied (24 units) three units per week • For a period of 8 weeks, the relative speed of the runners was created according late Iron speed rate for the first runner and then determine the rate of speed of the second runner for Make Joint Exercises (supplement) The researchers by using the tests from 14-16/4/2018.

**Discussions**

<table>
<thead>
<tr>
<th>Table 2: Statistical processors of time and spacing of switches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stages</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>The first</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>The second</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Conted…

| The third | Switching time | Sec. | 3.565 | 0.61 | 1.85 | 0.30 | 1.715 | 0.201 | 0.000 | 8.500 | Sig. |
| Switch distance | M. | 10.30 | 5.10 | 25.9 | 2.45 | 15.60 | 3.184 | 0.011 | 4.898 | Sig. |
| Time to run in the switch area | Sec. | 5.873 | 0.34 | 5.12 | 0.34 | 0.753 | 0.246 | 0.035 | 3.05 | Sig. |
| Achievement | Sec. | 48.8 | 0.39 | 47.07 | 0.054 | 1.80 | 0.134 | 0.000 | 13.41 | Sig. |

Indication below error level ≤ 0.05 and (Degree of freedom = 7)

It is noted that there has been an improvement in the replacement time in the dimensional test and this improvement is evident by decreasing the arithmetic mean in the three switching areas. This improvement was shown in Spaces Switch and that means getting fit in the rush between the runners, making them reach the highest relative velocity between them. Result Adopted. Training according to the speed indicator. The total time of the switching area between the Muslim player and the recipient is also improved.

Table 3: Sequence racers according to the best speed first and 30 meters see within racing distances

<table>
<thead>
<tr>
<th>Sequence Please Racers According to the rate of speed</th>
<th>Speed preferred to and for 30 m to all Distances</th>
<th>Speed preferred to30 m See From 110 m</th>
<th>Speed preferred to30 m See From 120 (M)</th>
<th>Speed preferred to 30 m From 130 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me</td>
<td>Go away</td>
<td>Me</td>
<td>Go away</td>
<td>Me</td>
</tr>
<tr>
<td>2</td>
<td>7.537</td>
<td>8</td>
<td>4</td>
<td>8.547</td>
</tr>
<tr>
<td>3</td>
<td>7.50</td>
<td>7.874</td>
<td>3</td>
<td>8.571</td>
</tr>
<tr>
<td>5</td>
<td>7.389</td>
<td>8</td>
<td>8</td>
<td>8.147</td>
</tr>
<tr>
<td>7</td>
<td>7.228</td>
<td>7.481</td>
<td>5</td>
<td>8.152</td>
</tr>
<tr>
<td>8</td>
<td>7.142</td>
<td>7.470</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

The table shows us the sequence of runners (racers) through the speed of the first and the last 30 meters within the races distances, showing that the sequence (6) possesses the best speed when starting from stability as well as the best speed when starting from movement, which means that it is appropriate to be the first runner that starts the race. Also followed by the first sequence with the same specifications, and so the players were put serialized correct according to the speed indicator they cut 30 meters The first and last. The results have indicated that every player has the possibility of cutting all the distance within the three test distances in order to harmonize the speed at which the Muslim runner arrives with the speed at which the recipient runner starts, and so that there is no delay or no downtime at the time of switching, the researcher used the relative speed indicator to determine this sequence scientifically as shown in the following table (4).

Table 4: Players’ sequence (delivery and receipt) according to their relative speed of the first four best contestants

<table>
<thead>
<tr>
<th>Delivery area</th>
<th>Racers sequence</th>
<th>Speed for 30 Meter Of fortitude for the Muslim and 30 m From the movement to touch</th>
</tr>
</thead>
<tbody>
<tr>
<td>first test</td>
<td>final test</td>
<td></td>
</tr>
<tr>
<td>The first</td>
<td>Delivery 6</td>
<td>9.523</td>
</tr>
<tr>
<td>Recipient 4</td>
<td>7.614</td>
<td>7.978</td>
</tr>
<tr>
<td>The relative</td>
<td>1.906</td>
<td>1.858</td>
</tr>
<tr>
<td>The second</td>
<td>Delivery 4</td>
<td>8.797</td>
</tr>
<tr>
<td>Recipient 2</td>
<td>7.534</td>
<td>8</td>
</tr>
<tr>
<td>The relative</td>
<td>1.263</td>
<td>0.955</td>
</tr>
<tr>
<td>The third</td>
<td>Delivery 2</td>
<td>8.333</td>
</tr>
<tr>
<td>Recipient 1</td>
<td>7.792</td>
<td>8</td>
</tr>
<tr>
<td>The relative</td>
<td>0.541</td>
<td>0.695</td>
</tr>
</tbody>
</table>
Shows that there is a decrease in the relative velocity between the sequence (6) of the sample of the search and sequence (4) of the same sample, In the dimensional test, this means that there is compatibility synchronization of the arrival of the recipient runner to the maximum speed with the speed at which the Muslim runner reaches the delivery point, and this has to do with the good distance of the delivery area and as What said no In the previous discourse with regard to the spatial and temporal areas that evolve In the Telexed, its development was consistent with the evolution of relative velocity. As velocity of the fourth sequence with the velocity of the second sequence of search sample members according to their relative velocity index, while the velocity of the second sequence was consistent with the velocity of the first sequence of the search sample by the relative velocity index also between them. Table (6) also shows the sequence between the velocities of the remainder of the sample, as the compatibility appeared according to the relative velocity index between sequence 3 and 5, sequence 5 and 7, and sequence 7 and 8.

**Table 5: Players sequence (delivery and the recognizes) according to their relative speed of the second best four contestants**

<table>
<thead>
<tr>
<th>Delivery area</th>
<th>Hierarchy Racers</th>
<th>Speed for 30 Meter Of fortitude for the Muslim and 30 m Of the movement to touch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>first</strong> test</td>
</tr>
<tr>
<td>The first</td>
<td>Delivery 3</td>
<td>8.571</td>
</tr>
<tr>
<td></td>
<td>Recipient 5</td>
<td>7.389</td>
</tr>
<tr>
<td></td>
<td>The relative</td>
<td>1.182</td>
</tr>
<tr>
<td>The second</td>
<td>Delivery 5</td>
<td>8.130</td>
</tr>
<tr>
<td></td>
<td>Recipient 7</td>
<td>7.228</td>
</tr>
<tr>
<td></td>
<td>The relative</td>
<td>0.902</td>
</tr>
<tr>
<td>The third</td>
<td>Delivery 7</td>
<td>7.299</td>
</tr>
<tr>
<td></td>
<td>Recipient 8</td>
<td>7.142</td>
</tr>
<tr>
<td></td>
<td>The relative</td>
<td>0.157</td>
</tr>
</tbody>
</table>

Thus, the researchers conclude that the adoption of the RSI between the speed of the players is a scientific indicator that gives high precision in the selection of players according to their speed, both when the Muslim player arrives and has a certain velocity expressed by the tests of the last run time 30 meters within the distances of the tests adopted by Researchers N, at the start of the runner received from fortitude and expressed by the tests of the first run time 30 meters. This indicates the effectiveness of the exercises of speed and relative speed based on the scientific basis in the development of relative velocity and its adoption in determining the sequence and capabilities of the relay runners, Training must be (using the lowest speed of the maximum speed, taking into account that it does not lead to muscular contraction, and that kinetic performance is timely, streamlined and relaxed).

**Conclusions**

Acceleration may evolve as a result of the training applied by the sample (the first 30-meters time See). The speed of the research sample has evolved as a result of applying special exercises on them (the last 30-meters time), speed tolerance for distance of race distances has been improved. The harmony between the spatial and temporal sphere was demonstrated by the tests applied Speed integration between the Muslim player and the receiving player. I said differences in the relative velocity between the members of the search sample. There is a convergence in the relative speed values of the players in the delivery and receiving areas due to the exercises applied. The relative velocity index helped to determine the sequence of players and their standing in the switching areas and in accordance with the best receipt and delivery process and without Decreased Of the total time of the competition.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors have no conflict of interest.

**Source of Funding:** Self-funding

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The Effects of Photodynamic Therapy Using Green Laser and Glutathione-Capped-Gold Nanoparticles on Cancer Cells (MCF-7 Cell Line)

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ABSTRACT

Background: Nanotechnology is a discipline that manages, constructs, analyzes and deals with application of materials that have diameter from 1 to 100 nanometers. Gold nanoparticles are defined as stable colloid solutions of clusters of gold atoms with sizes at this minuscule.

Objective: The objective of current study was to treat breast cancer using gold nanoparticles capped with drug molecules in specific quantities to reduce the harmful side effects.

Method: The gold nanoparticles were prepared by method of Brust-Schiffrin. These nanoparticles were capped with type of drug (Glutathione) used to treat cancerous tumors. These gold nanoparticles were uncapped with drugs at (526nm) when capped with the glutathione drug at (589nm).

Results: The resulting evidence suggested that Glutathione-capped Gold nanoparticles were non-toxic up to the maximum recommended dosage. Therefore, the demonstrated biocompatibility offers the potentials of Glutathione-capped with Gold nanoparticles. The candidate is considered as a medicine for cancer therapy.

Keywords: Gold nanoparticles, PDT, MCF-7 cell, glutathione, breast cancer.

Introduction

Nanotechnology is a discipline that manages, constructs, analyzes and deals with application of materials that have diameter from 1 to 100 nanometers. Gold nanoparticles (AuNps) are defined as stable colloid solutions of clusters of gold atoms with sizes at this minuscule. They possess different physicochemical characteristics when compared to the bulk gold, the most obvious example being the color change from yellow to ruby red when bulk gold is converted into nanoparticulate gold. The surface plasmon resonance (SPR) peak is positioned at 520nm and this peak is responsible for the ruby red color displayed by conventional gold colloids. This ruby red color of AuNps is explained by a theory called “surface plasmonics”. According to this theory, when the clusters of gold particles are hit by the electromagnetic field of the incoming light, the surface free electrons (6 electrons in case of AuNps) present in the conduction band of AuNps oscillate back and forth, thus, creating a plasma band which has an absorption peak in the visible region at 530-540nm. The surface plasmon band (SPB) of AuNps is used as an indicator for formation during the synthesis of AuNps from their precursor salts. Physical properties of AuNps in turn depend on the size, shape, particle-particle distance and the nature of the stabilizer used to prevent the agglomeration of nanoparticles. According to Mie theory, Surface Plasmon Band (SPB) is absent for AuNps less than 2nm and greater than 500nm. Gold nanorods have two SPB’s, one longitudinal wavelength band at 550-600nm and one transverse wavelength band at 520nm. The longitudinal wavelength band is very sensitive and changing the aspect ratio of Gold nanorods

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changes the absorption region from visible to near infra-red (NIR). This unique optical property of Gold nanorods is used in near infra-red ray therapy [26] and can be used as a therapeutic means to eradicate diseased cells which forms the basis for cancer treatment using Photodynamic therapy (PDT). It is a minimally invasive technique for cancer therapy.

The use of laser in medical applications has grown enormously from the time of its invention in 1960 to present days [15,16]. In this regard, the use of laser in photodynamic therapy (PDT) has gained increasing interest in medicine representing an experimental tool for the detection and treatment of tumors located in the lung, esophagus, colon, peritoneum, pleura, genitourinary tract, brain, eye and skin [17].

Current study was aimed to treat breast cancer using gold nanoparticles capped with drug molecules in specific quantities to reduce the harmful side effects and the use of lasers as an additional means to kill cancer cells through what is known as the Photodynamic therapy (PDT).

Materials and Method

Glutathione-capped gold nanoparticles (GSH-AuNPs) synthesis: The gold nanoparticleas (AuNps) were prepared by method of Brust-Schiffrin [19]. A volume of 1ml of 0.1M HAuCl₄ was added in 500ml deionized water by a stirring device. Then, 0.06g NaBH₄ placed in 10ml deionized water. Prepared 10ml of NaBH₄ solution. The solution changes from yellow to dark red. The dark red disappears by stirring for 1.5h. Then, adding 0.1g of glutathione to AuNps solution with continuous stir for 2h to obtain AuNps solution to larger size of particles due to glutathione capped. The obtained nanoparticles were subjected to centrifugation at 13000rpm for 15min.

Lasers for heating Gold nanoparticles: The lasers used as a source of heating for AuNps with Glutathione and AuNps with cisplatin in the cell lines, were two continuous lasers; model MGL-III-532-110mW (532nm), and MRL-III-650 and 41mW output power.

Methyl Thiazolyl Tetrazolium (MTT) solution: MTT is a yellow-colored water soluble tetrazolium dye. Mitochondrial lactate dehydrogenase, produced by metabolically active cells, reduces MTT to water-insoluble Formosan crystals. When dissolved in appropriate solvent, these Formosan crystals exhibit purple color. The intensity of the purple color is directly proportional to the number of viable cells and can be measured spectrophotometrically at 570nm. In order to prepare a 5mg/ml concentration of the dye according to [24], 0.5g of MTT was dissolved in 100mL of PBS. The solution was filtered through 0.2µm syringe filter to remove any blue Formosan product and then stored in sterile, dark, screw-capped bottles at 4°C. The solution was used within no longer than 2 weeks of preparation.

Characterized gold nanoparticles: The particle size and zeta potential of AuNps were measured using transmission electron microscope (TEM) before being capped with glutathione by transmission electron microscopy (TEM). Light absorption measured by UV spectrophotometer at wavelength 400-800nm before and after glutathione capped.

Cells viability assay

MCF-7Cells:

Organism: Homo sapiens, human Tissue of mammary gland, breast; derived from metastatic site: pleural effusion, Cell Type of epithelial, Product Format of frozen, Morphology: epithelial, Cultural Properties: adherent, Disease: adenocarcinoma, Age: 69 years adult, Gender: female, Ethnicity of Caucasian, Complete Growth Medium: The base medium for this cell line is ATCC-formulated Eagle’s Minimum Essential Medium, Catalog No. 30-003. To make the complete growth medium, add the following components to the base medium: 0.01mg/ml human recombinant insulin; fetal bovine serum to a final concentration of 10%. Culture conditions: Atmosphere: 95% air, 5% carbon dioxide and 37°C temperature.

The viability of melanoma cells treated with chemical agents was determined via the MTT assay. The cell viability was determined before assessing the cytotoxic effect of AuNps, AuNps+GHS, GHS, and Laser green time on cell lines. Seeding of trypsinized and suspended cells for any cell line in a microtiter plate should be in the range of 21–22 cell/well for the cytotoxicity assay as mentioned by [23]. Viable cell counting was accomplished by using trypan-blue exclusion. Dead cells take up the dye within a second making them easily distinguishable under the microscope from viable cells which remain unstained. The following protocol was conducted:

Cell suspension was prepared MCF-7 cancer cell. The hemocytometer with its cover slip fixed on its place was prepared (for counting soon). Adding 0.2ml of cell suspension to 0.2ml trypan-blue and 1.6ml PBS. Then, adding 20µl from the mixture to the edge of the cover
slip, allowed to run into the counting chamber. After 1-2 minutes viable and dead cells counting started with light microscope at 40X magnification. Cells concentration (cell/ml), total cell count and cell viability (%) were calculated as in the following equations:

\[ C = n \times d \times 10000 \]  
\[ \text{Where } C= \text{Cell concentration (cell/ml), } n= \text{number of counted cells and } d= \text{dilution factor= 10.} \]

Total cell count= \( C \) (cell/ml) \( \times \) the original volume of fluid from which the cell sample was taken.

Cell viability (%) = 
\[ \frac{\text{Total viable cells (unstained)}}{\text{Total cells counted (stained & unstained)}} \times 100 \]  
\[ \text{...}(2) \]

**Treatment conditions and experimental groups:** To investigate the potential effect of hyperthermia on cell growth and survival, cell viability was assessed by the MTT assay. In brief, the cells were seeded into 6-well plates at a density of 5-105 cells/well and were exposed to MW exposure for 24h. Then they were allowed.

For each exposure time (5, 10 and 15 minutes) the irradiation experiments (6 replicate wells for each group) were done in dark room including the:

**Experimental groups for in vitro study** including the following groups:

Group (A): this group was considered as control group.
Group (A1):This group was treated with AuNps.
Group (A2): PDT group was treated with AuNps.
Group (A3): this group was treated with AuNpsGHS.
Group (A4): this group was treated with AuNpsGHS + Laser Green.

After the irradiation, the plates were sealed with self-adhesive transparent film then incubated at 37°C.

**Results and Discussion**

**Characterization of Gold Nanoparticles (AuNps):**

The volume drawn from AuNps stock solution was 125µl. From the curves in Figure (1) when the volume ratio is increased, the surface Plasmon resonance shifts to the right or red shift and increased intensity occurred. These results agree with [63] and become more broadening which indicate a different size or the size of AuNps increased, while the size of AuNps become monodisperse when the volume ratio decreased. This was in agreement with [43, 47].

Table (1) showed the value of the wavelength where the peak of the observance of surface plasmon resonance of gold nanoparticles for different volumes of HAucI4 solution, represents SPRs of Glutathione capped-gold nanoparticles (GSH-AuNPs). From the UV–visible spectra of both AuNPs and nanoglutathione drug capped the gold nanoparticles made the wavelength peak of surface Plasmon resonance slight shift to higher wavelength (red shift). These results are in agreement with [63] and indicated that the size of the gold nanoparticles is increased [37].

<table>
<thead>
<tr>
<th>Molarity of AuNPs (µM)</th>
<th>SPR wavelength of AuNPS λ (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.354</td>
<td>526</td>
</tr>
<tr>
<td>0.443</td>
<td>523</td>
</tr>
<tr>
<td>0.531</td>
<td>520</td>
</tr>
</tbody>
</table>

Figure 1: Effect of Glutathione-capped gold nanoparticles (GSH-AuNPs) on Surface Plasmon Resonance results revealed the shift of maximal absorption peak to 589 nm after surrounding gold nanoparticle surface with glutathione.
Shape and size of Gold nanoparticles (TEM and SEM): Figure (2) showed a transmission electron microscopy (TEM) which was used to take an image to the gold nanoparticles, with or without coating by nano and GHS, used for measuring the size of gold nanoparticles. The 0.333μM of Chloroauric acid solutions were used to synthesized the gold nanoparticles with or without coating by nanoparticles. The TEM device showed a monodisperse and spherical shape. These results were in agreement with those reported by [20] for the solutions of 0.333μM of AuNps prepared by Brust-Schiffrin.

Figure 2: a: TEM image with X92000 magnification power and b: the granulate accumulation distribution chart for AuNps

Figure 3 showed gold nanoparticles Glutathione-capped (AuNps-GSH) prepared by Brust-Schiffrin. It can be noticed the increase in the size of nanoparticles from 5nm to 15nm.

Figure 3: a: Represents Glutathione-capped gold nanoparticles TEM image with ×250000 magnification power and b: The granulate accumulation distribution chart for AuNps and capped glutathione (GHS).

The Effect of Gold Nanoparticles concentration on cancer cells (MCF-7): Different concentrations of uncoated gold nanoparticles of sizes 5nm and 15nm were used to determine the lethal or cytotoxic concentration.

Effects of AuNps cytotoxicity on MCF-7 cell line (MTT assay): Figure 4 showed that the viability percentages
of MCF-7 cell line in the presence of different concentrations of AuNps (1, 0.5, 0.25, 0.125, 0.0625 and 0.03125mg/ml) after 24h incubation, ranged from 58.9% to 92.5%. It can be seen that a significant decrease in cell viability was observed when cells were incubated with 0.03125mg/ml GNPs (survival rate = 92.5%). This effect increases as GNPs concentration increased to 1mg/ml (survival rate = 58.9%). In Figure (4), GNPs with consecrations (1, 0.5, 0.25, 0.125, 0.0625 and 0.03125µ/ml) did not show any significant difference compared to GNPs with consecrations (1, 0.5, 0.25, 0.125, 0.0625 and 0.03125µ/ml) (P = 0.0527). We can calculate the IC50 (the concentration that induced 50% viability) of AuNps for 24h to be 0.253µg/ml. Data revealed that the viability percentage of MCF-7 cell line in the presence of different concentrations of GHS (Glutathione) (1, 0.5, 0.25, 0.125, 0.0625 and 0.03125mg/ml) ranged from 95.95% to 102.6% after 24h incubation. We can calculate the IC50 to be 0.664µg/ml. Cells viability after treatment with Glu-AuNPs (1µg/ml) was reduced to 38.7% after 24h incubation. We can calculate the IC50 to be 0.174µg/ml.

**Figure 4: Effect of different concentrations on GHS-AuNps and capped AuNps and GHS on cancer cells**

**Effect of laser Exposure time on cancer cells:** Using green laser of the wavelengths 532nm and output power of 110mw, but the laser exposure times were used in minutes (5, 10 and 15). Plano Convex lens at focal length 3cm at distance 17.5cm from laser aperture has been used as a beam expander to produce a beam diameter of 15mm to cover the area for each well (24 wells). Plates were seeded with MCF-7 cell line. The results showed that the viability percentage of MCF-7 cell line in the presence of different concentrations of AuNps and Glutathione (1, 0.5, 0.25, 0.125, 0.0625 and 0.03125mg/ml) was ranged from 23.06% to 56.3% at 15-minute time, while at 10- and 5-minute times, it ranged from 16.83% to 65.6% and from 26.2% to 85.8%, respectively (Figure 5).

**Figure 5: Effects of different concentrations and Laser green and AuNps on cancer cells**
Moreover, Figure (6) showed that the viability percentage of MCF-7 cell line in the presence of different concentrations of AuNps and Glutathione (1, 0.5, 0.25, 0.125, 0.0625 and 0.03125mg/ml) ranged from 18.51% to 40.4% at 15-minute time, while at 10- and 5-minute times, it ranged from 23.5% to 82.6% and 45.4% to 83.8%, respectively.

![Graph showing effects of different concentrations and Laser green-capped AuNpsGHS on cancer cells](image)

**Figure 6: Effects of different concentrations and Laser green-capped AuNpsGHS on cancer cells**

**Conclusions**

The resulting evidence suggested that Glutathione-capped AuNps were non-toxic up to the maximum recommended dosage. Therefore, the demonstrated biocompatibility offers the potentials of Glutathione-capped AuNps as a medicine for cancer therapy.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

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Study of Immunological Parameters and Epidemiology Features to Rheumatoid Arthritis Frequency in Kerbala City, Iraq

Alyaa Aziz Gubiar Al-Nasrallah
Ibn Hayyan College University, Kerbala, Iraq

ABSTRACT

Rheumatoid arthritis (RA) is one common currently disease within the world. The study exhibited relation between the elevated levels of Anti-CCP which has more specify and RF with RA disease activity.

Anti-Cyclic Citrullinated Peptide (Anti-CCP) and Rheumatoid Factor (RF) analysis are the best and crucial parameters for diagnosis rheumatoid arthritis because their different levels in circulated system in patients with rheumatoid arthritis about controls give important indicators for diagnosis this disease together with the symptoms.

Immunologic and demographic study including (100) samples classification in (50) patients with rheumatoid arthritis in the aging groups ranging from (>30 - <50 yr.), (18) male and (32) female compare with (50) controls samples and measured levels of Anti-CCP by (CHORUS-Anti-CCP kit) based on the ELISA principle in addition to measuring RF levels by (Nephelometry kit) in the serum.

Age and gender represent risk factors, increase development of (RA) disease with aging, increase appear (RA) in female than male. Elevated Anti-CCP and RF antibodies in the serum of (RA) patients compare with healthy in Karbala city. The concentration of Anti-CCP and RF are elevated with aging, and in female more than male.

Keywords: Anti-Cyclic Citrullinated Peptide, Rheumatoid Factor.

Introduction

Rheumatoid arthritis (RA) is referred as an inflammatory condition in the joints unknown etiology (1), characterized with most symptoms including pain, redness, swelling, with Moderate rise in temperature in the area swollen joints (2). Rheumatoid arthritis is autoimmune disease with progression inflammatory happen as a hyper response of the immune system in the body to some diseases such as some inflammatory (3). (RA) do not infected joints only it can be evaluation progressing effects on other organs such as the heart, kidneys, eyes and nerves (4). RA causes to inflammation of articular membrane of the joints and then being the joints erosion and lose its functions (5). (RA) is a common disease in the world, Average of infected with (RA) arranged between 0.5% for 1% (6). (RA) often appear on the people aged between (20-50) years old (7). The incidence of the disease is twice as high in woman than men (8). The appearance of symptoms varies and depending on the effect of the disease it may appear slow and be progressive with age limitation and some appear to be fast (9). Based on the apparent clinical symptoms, RA is diagnosed in different ways. X-rays are usually performed on the hands and feet, MRI, ultrasound, immune tests in laboratory (10). There are different types of antibodies in sera patients with (RA) (11). The process of rheumatoid examination includes (RF) analysis should be initiated when rheumatoid is involved during the clinical examination which depending on agglutination reaction. Anti-CCP analysis developed for the diagnosis of (RA) because the analysis of (RF) is not a qualitative or specific analysis of the disease. Anti-CCP analysis is often positive in 70% of rheumatoid patients (12). First discovery of Anti-CCP antibodies in (RA) sera patients by Nienhuis et al in 1964 (13-15). Rheumatoid Factor (RF) isotype have different affinity. RF antibodies represent one class of immunoglobulins (16). First described by Rose 1948 in patients with RA (17). Although they first

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described in RA but it can be found in another patient’s sera such as systematic lupus erythematosus (18). The elevated concentration RF in AR disease using in the diagnosis (19). Two types of medical treatments are recommended in the body, in patients with MS. Such as cortisone, can be used for a long time (20).

Materials and Method

Samples were collected (n=50) patients, of different age groups ranging from (>39 -<50 yr). The collection of samples occurs during the period from October 2018 to February 2019 from the joint and orthopedic consultation at Al Hussein Educational Hospital in Karbala city. According to the demographic data (Age, Sex): Patients classification in (n=18) males and (n=32) females compared to the apparently healthy control group, noting that they were free of any symptoms based on the clinical diagnosis by the physician and their healthy life history of (n=50). excluding the group of patients with hepatitis Interference between patients and the effect of this on study parameters as measured body levels. parameters have been determining were CHORUS-Anti-CCP in addition to measuring RF levels in the serum after the blood has been collected and centrifuged at 3000p for 15 min and stored at -80 °C until using. serum counted rheumatoid factor (were determine by Rheumatoid Factor Detection Kit (Nephelometry), Genrui-Biotech Inc China) according to the manufacture instruction positive result 0-201U/ml and determined anti- CCP (CHORUS ANTI-CCP, REF 86094- REF 86094/12, Disease Diagnosis Senese S.P.A Via delle Rose,10-53035 Monteriggioni (Siena) Italy) by using a disposable device on the chorus and chorus TRIO instruments the test based on the ELISA principle the result is positive when concentration in the sample is > 18 AU/ml.

Statically analysis by X² test, students’ independent T test, L.S.D test And p value (<0.05) and ANOVA appropriate.

Results and Discussion

Results of the current study on Rheumatoid Arthritis (RA), All patients underwent serological and radiological tests. The demographic distribution of research samples are (100 samples 50 patients:20 male, 30 female) and summarized in table (1) which divided the study samples into three age groups depending on age, the first category have more frequently was >39 years 28 (56.0%) compare to control at same category 32 (64.0%), followed by the category < 50 years 12 (24.0%) while the control 10 (20.0%), then the category 40-50 years 10 (20.0%) to control 8 (16.0%). The results show P. value 0.68. The results show (18 (47.4%, 32 (51.6%)) in male and female respectively compare to control (20 (52.6%), 30 (48.4%)). Many advance analysis was used to detect the important the dependent variables (Questionnaire data) and independent variables such as Age, Gender, Duration, Disease history and another patient data). The results refer the data (Age, Gender, Duration, Disease activity) more related to loss physical ability in the body, where disease activity have effects on physical body functions (21). The demographic data distribution show relationship between Rheumatoid and aging, During this study more categories that affected by Rheumatoid disease are >39 years, then <50 years. The frequency of disease is high in older patient. The pervious study demonstrated relation between (RA) and infected by another disease (22). (RA) is one of the inflammatory disease that distributing in older. Currently the pathogenicity of (RA) increase up to 85 years old. The percent of prevalence of (RA) in 60 years old and older reach to 2% (23). With refer to gender researches have been suggested that women with (RA) worse than male (24). The reasons are worse in female patients to the fact that the muscles mass and strength is greater in the male that allow them to prevent functional losses (25). many autoimmune disease affected on female more than male one of this disease AR where the sex ratio around 3:1 (26). The passive response in women relation to the genetic etiology (X-linked) factor, hormonal and immune response (27).

Table 1: Demographic study distribution between (Rheumatoid patients and control)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Samples</th>
<th>X²</th>
<th>P. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients N. (%)</td>
<td>Control N. (%)</td>
<td></td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;39 years</td>
<td>28 (56.0%)</td>
<td>32 (64.0%)</td>
<td>0.67</td>
</tr>
<tr>
<td>40-50 years</td>
<td>10 (20.0%)</td>
<td>8 (16.0%)</td>
<td></td>
</tr>
<tr>
<td>&lt; 50 years</td>
<td>12 (24.0%)</td>
<td>10 (20.0%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18 (47.4%)</td>
<td>20 (52.6%)</td>
<td>0.17</td>
</tr>
<tr>
<td>Female</td>
<td>32 (51.6%)</td>
<td>30 (48.4%)</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>50 (100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The results at this chart showed that the percentage of disease is clear in females compared to males. The percentage of disease in patients female have 32% compared to control female which have 30%. As regards to the male has different from the female, the percentage of patients from the male is less than control, they have 18%-20% respectively.

![Figure 1: The distribution of kidney failure patients according to Gender compare to control](image)

The Outcome in table (2) recorded differences in levels of Anti-CCP parameter in sera of (RA) patients (38.67 ± 10.65, 52.3 ± 2.21, 64.39 ± 3.27) (U/ml) respectively compare with control which have (4.84 ± 1.24, 7.15 ± 0.25, 8.04 ± 0.25) (U/ml) respectively according to age. The differences between the groups were examined below the level of significance (p<0.05) for all the criteria. The results show that the differences in biomarkers levels were statistically significant. The recorded results according to measuring RF factor are indicated to the means of RF factor in rheumatoid patients have different in statistically significant at (p≤0.05). The highest level of RF factor in <50 years (64.39 ± 3.27) (U/ml) compare with category of control 8.04 ± 0.25(AU/ml) and low level in > 39 years (38.67 ± 10.65) (U/ml) which have different from control 4.84 ± 1.24 (U/ml) significantly. The present study show after we analyzed the data that the value of biomarkers Anti-CC, RF factor are increased in the serum of Rheumatoid Arthritis patients in Karbala city in Iraq, This refer for correlation with Rheumatoid disease activity.

Researches refer Anti-CCP have higher positive value to Rheumatoid disease (28). Anti-CCP is a specific antibodies have height sensitivity in Rheumatoid disease (29), Anti-CCP antibodies induced by special enzymes that coded by (PADI) Type 4 genes, the research suggested Anti-CCP antibodies have inflammatory role Rheumatoid disease (30). One of the important criteria that affected on (RA) developments is age. Age is represent important risk factor lead to development many disease such as inflammatory immune disease, cancer diseases and Rheumatoid Arthritis. Aging can be caused damage to the DNA, different in body buffers and affected on many physiologic process in the bodies (31). Results refer that (RA) may developed in the young ages but can development with age increasing. RF factor play important role in RA diagnosis (32) so that RF testing have been used as one classification of criteria for RA diagnosis, there levels increase with aging (33). In addition to RF testing, Anti-CCP can be used for analysis (34). Anti-CCP more specify than RF factor (35).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
<th>Patients (Mean ± SD)</th>
<th>Control (Mean ± SD)</th>
<th>T- test</th>
<th>P. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-CCP Antibody (U/ml)</td>
<td>&gt; 39 years</td>
<td>38.67 ± 10.65</td>
<td>4.84 ± 1.24</td>
<td>17.85</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>40-50 years</td>
<td>52.3 ± 2.21</td>
<td>7.15 ± 0.25</td>
<td>59.53</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>&lt; 50 years</td>
<td>64.39 ± 3.27</td>
<td>8.04 ± 0.25</td>
<td>54.12</td>
<td>0.00</td>
</tr>
<tr>
<td>RF factor (U/ml)</td>
<td>&gt; 39 years</td>
<td>28.8 ± 5.68</td>
<td>6.35 ± 0.79</td>
<td>22.16</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>40-50 years</td>
<td>48.2 ± 5.87</td>
<td>7.73 ± 0.21</td>
<td>19.39</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>&lt; 50 years</td>
<td>52.42 ± 6.33</td>
<td>8.68 ± 0.35</td>
<td>21.73</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The results shown in table (3) the effect of gender on the immunological parameters under study and their relationship with Rheumatoid disease. Here, the statistical analysis examined the study of male patients compared with male control group show that the average group of patients have different in the means between male and
female. In the same way there are different between patients and control. The different was significant at \((p\leq0.05)\). The levels of Anti – CCP Antibody increase significantly in the female \(50.89 \pm 13.66 (U/ml)\) about male \(41.67 \pm 11.62\), as well as there are significant different between the control \(6.18 \pm 1.99 (U/ml)\) in the female group. The study carried out a comparison between the female Rheumatoid patients and the female control group, the mean reached \(40.22 \pm 12.95(U/ml)\) in female patients about control \(7.31 \pm 1.35(U/ml)\) the different is statically significant between them. The results show the average of RF factor are increase in female patients \(40.22 \pm 12.95(U/ml)\) and decrease in male \(35.02 \pm 02(U/ml)\), reached in control \(6.62 \pm 0.73(U/ml)\) and \(7.31 \pm 1.35(U/ml)\) respectively at \((p\leq0.05)\). Through this study found relationship between Anti-CCP, RF and gender, the parameters are increase significantly in female compare with male. Gender represent another risk factor influences on the results of (RA) development \((36)\). (RA) in woman have higher and faster disease activity and progressive over time. some researchers suggested there are relation between gender and severity of pathogenicity \((37)\).

Table 3: The mean differences of Anti – CCP Antibody between (Rheumatoid patients and control) according to Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>SEX</th>
<th>Patients (Mean ± SD)</th>
<th>Control (Mean ± SD)</th>
<th>T-test</th>
<th>P. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti – CCP Antibody (U/ml)</td>
<td>Male</td>
<td>41.67 ± 11.62</td>
<td>5.36 ± 1.12</td>
<td>13.93</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>50.89 ± 13.66</td>
<td>6.18 ± 1.99</td>
<td>17.75</td>
<td>0.00</td>
</tr>
<tr>
<td>RF factor (U/ml)</td>
<td>Male</td>
<td>35.02 ± 02</td>
<td>6.62 ± 0.73</td>
<td>11.67</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>40.22 ± 12.95</td>
<td>7.31 ± 1.35</td>
<td>13.85</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Conclusion**

Age and gender represent risk factors, increase development of (RA) disease with aging, increase appear (RA) in female than male. Elevated Anti-CCP and RF antibodies in the serum of (RA) patients compare with healthy in Karbala city. The concentration of Anti-CCP and RF are elevated with aging, and in female more than male.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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Standing Committee for International Clinical Studies Including Therapeutics (ESCISIT). Ann Rheum Dis, 66, 2007;34–45


Bloodstream Bacterial Infections in Children Inpatients

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¹Department of Microbiology, College of Medicine, University of Anbar, Iraq

ABSTRACT

Bloodstream bacterial infections are one of the most common health-care associated issues, and its lead to a high mortality rates, detection of bloodstream infections in children and infants as soon as possible could prevent reaching of causative agents to other organs like kidneys, heart or brain. In spite of a significant and serious number of cases, there are few studies of bloodstream infections in pediatric patients, therefore, this study was undertaken to detect the bacteria causing bloodstream infections in pediatric inpatients and study their antibiotics susceptibility profile.

Total 380 blood specimens were collected from hospitalized children, 19.5% of them developed positive blood culture. Staphylococcus aureus caused 25.67% of total infections, followed by CoNS 22.97%, K. pneumoniae 18.90%, P. aeruginosa 16.25%, E. coli 12.16%, Acinetobacter sp. 2.70%, and Strep. pyogenes (1.35%), Whereas Ceftazidime, Amikacin, Ceftriaxone, and Vancomycin were most effective antibiotics, while maximum resistance was to Erythromycin, Penicillin G, and Cefotaxime. Regarding to the age groups and gender, 31 days – 12 months age group and male were more likely to suffering from bloodstream infections.

Keywords: Bloodstream infections; Blood culture; Antibiotics susceptibility; Pediatric.

Introduction

Bloodstream infections defined as invasion of microorganism into the bloodstream and occurs when viable microorganism enter the bloodstream either nosocomial or community-acquired. Some asymptomatic systemic fungal infections were reported that have important clinical concerns. Blood stream bacterial infections are one of the most common healthcare associated issues, and its lead to a high mortality rates (20% – 50%) 

Common bacterial causes of bloodstream infections include Staphylococcus aureus, Escherichia coli (E. coli), Coagulase Negative Staphylococci (CoNS), Enterococcus species, Pseudomonas aeruginosa, Klebsiella pneumoniae, Enterobacter cloacae, Proteus sp. and β-hemolytic streptococci. CoNS had been considered as nonpathogenic blood culture contaminant, but it had regard as a noticed cause of nosocomial blood stream infection as a result of increasing use of intravascular devices and an increase in number of hospitalized immune compromised patients.

The infections with multi antibiotics resistant bacteria are associated with nosocomial cases, almost in all cases, antibiotic treatment is started before the results of blood culture are available, thus, antibiotics susceptibility pattern of frequently isolated bacteria help the clinicians to use effective as well as empirical antibiotics. Most of studies related to bloodstream infections focus on the adult population, in spite of high levels of mortality regarded to bloodstream infections among hospitalized children and newborn especially in developing countries, in addition to immature immune system of neonate, there are many factors predisposing to neonatal bloodstream infections like maternal infections during pregnancy, delivery outside the hospital, material used in cutting and dressing the cord, prematurity, prolonged membranes ruptures, asphyxia, and length of period spent in hospital.

Because of all above, the purposes of this study were to detect the bacteria causing bloodstream infections in pediatric inpatients and study their antibiotics susceptibility profile.

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Materials and Method

Three hundred and eighty blood specimens were collected from hospitalized children in Al-Ramadi teaching hospital of gynecology and pediatric since march/2017 to Feb./2019, 2-5 ml of specimens inoculated into blood culture bottle containing 45 ml of brain heart infusion broth, then incubated overnight at 37 Celsius. After 24 hour, a sub culture was done on Mac-Conkey agar Blood agar, and Chocolate agar plates and incubated overnight at 37 Celsius, re-subcultures were performed on day 3, 4 and 7 in case of no growth observed on plate by first day [9]. Identification of growth was based on colony morphology, Gram staining and Vitek-32 system (BioMerieux).

Antibiotics susceptibility test was done via Kirby Bauer method. The pH of Muller Hinton agar was 7.4 and sterilized by autoclaving at 121 Celsius for 15 min and poured into plates, single isolated colony was transferred into peptone water and incubated at 37 Celsius for 4 hour, the density was adjusted to approximately 10 CFU/μL by comparing its turbidity with that of 0.5 McFarland standard opacity tube. Then the Muller Hinton agar plate was inoculated by spreading, via cotton swab, three times over the entire agar surface and allowed for 3-5 minutes before adding of antibiotic discs via sterile forceps, then plates were incubated overnight at 37 Celsius, the antibiotics susceptibility was determined by diameter measuring of inhibition zones [10].

Statistical analysis was done by Microsoft Excel 2010.

Results

Three hundred and eighty blood specimens were collected from hospitalized children in period of approximately two years, seventy four (19.5%) of them developed positive blood cultures. Most predominant isolate was *Staphylococcus aureus* (25.67%) followed by CoNS (22.97%), *Klebsiella pneumoniae* (18.90%), *Pseudomonas aeruginosa* (16.25%), *E. coli* (12.16%), *Acinetobacter sp.* (2.70%), and *Streptococcus pyogenes* (1.35%).

Male (72.34%) were more likely to be infected than female (27.66%), While the highest rate of infection was in the age group 31 days – 12 months (48.64%) followed by age group 2 - 5 years (37.83%), and age group 1-30 days (13.53%).

Antibiotics susceptibility profile for Gram positive bacteria were as follows: *Staphylococcus aureus* was susceptible for Cefuroxime (83.33%), Amikacin (80.28%), Cefuroxime (81.75%), Ceftriaxone (77.15%), and Ciprofloxacin (74.60%). CoNS isolates were susceptible for Cefuroxime (90.33), Amikacin (89.14%), Vancomycin (85.5%), Cefazidime (84.21%), and Ceftriaxone (82.73%), while *Streptococcus pyogenes* isolate was susceptible for Amikacin, Cefuroxime, Cefotaxime, Cefazidime, Norfloxacin, and Ceftriaxone. (Table 1)

Antibiotics susceptibility profile for Gram negative bacteria were as follows: *Klebsiella pneumoniae* was susceptible for Ciprofloxacin (86.12%), Vancomycin (83.45%), Ceftriaxone (82.66%), and Amikacin (81.22%). *Pseudomonas aeruginosa* was susceptible for Ciprofloxacin (83.33%), Ceftazidime (81.24%), and Ciprofloxacin (77.65%). *E. coli* isolates were susceptible for Amikacin (100%), Vancomycin (89.3%), Cefuroxime (86.73%), and Cefotaxime (85.44%). While the tow isolates of *Acinetobacter sp.* Were susceptible for Amikacin, Cefodizime, Vancomycin, Cefotaxime, Cefazidime, and Ciprofloxacin. (Table 1)

Maximum susceptibility was to Ceftazidime, Amikacin, Ceftriaxone, and Vancomycin, while maximum resistance was to Erythromycin, Penicillin G, and Cefotaxime. (fig. 2)

Fig. 1: Distribution of bacterial causative agents
Table 1: Antibiotics susceptibility profile

<table>
<thead>
<tr>
<th>Bacteria Antibiotics</th>
<th><em>Staph. aureus</em></th>
<th>CoNS</th>
<th><em>K. pneumoniae</em></th>
<th><em>P. aeruginosa</em></th>
<th><em>E. coli</em></th>
<th>Acinetobacter sp.</th>
<th><em>Strep. pyogenes</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S%</td>
<td>R%</td>
<td>S%</td>
<td>R%</td>
<td>S%</td>
<td>R%</td>
<td>S%</td>
</tr>
<tr>
<td>Amikacin</td>
<td>80.28</td>
<td>19.72</td>
<td>89.14</td>
<td>10.86</td>
<td>81.22</td>
<td>18.78</td>
<td>44.73</td>
</tr>
<tr>
<td>Cefodizime</td>
<td>73.50</td>
<td>26.50</td>
<td>71.93</td>
<td>28.07</td>
<td>79.64</td>
<td>20.36</td>
<td>24.14</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>59.33</td>
<td>40.67</td>
<td>85.50</td>
<td>14.50</td>
<td>83.45</td>
<td>16.55</td>
<td>68.41</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>81.75</td>
<td>18.25</td>
<td>90.33</td>
<td>9.67</td>
<td>-</td>
<td>-</td>
<td>29.64</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>53.32</td>
<td>46.68</td>
<td>76.32</td>
<td>23.68</td>
<td>27.77</td>
<td>72.23</td>
<td>21.94</td>
</tr>
<tr>
<td>Penicillin G</td>
<td>-</td>
<td>-</td>
<td>68.11</td>
<td>31.89</td>
<td>37.41</td>
<td>62.59</td>
<td>-</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>83.33</td>
<td>16.67</td>
<td>84.21</td>
<td>15.79</td>
<td>72.56</td>
<td>27.44</td>
<td>81.24</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>47.80</td>
<td>52.20</td>
<td>-</td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>61.14</td>
<td>38.86</td>
<td>70.16</td>
<td>29.81</td>
<td>79.00</td>
<td>21.00</td>
<td>77.65</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>74.60</td>
<td>25.40</td>
<td>59.60</td>
<td>40.4</td>
<td>86.12</td>
<td>13.88</td>
<td>83.33</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>77.15</td>
<td>22.85</td>
<td>82.73</td>
<td>17.27</td>
<td>82.66</td>
<td>17.34</td>
<td>76.50</td>
</tr>
</tbody>
</table>

**Note:** Antibiotics susceptibility results of *Acinetobacter sp.* and *Strep. pyogenes* were excluded due to the low number of isolates.

**Discussion**

Detection of bloodstream infections in children and infants as soon as possible could prevent reaching of causative agents to other organs like kidneys, heart or brain. In spite of a significant and serious number of cases, there are few studies of bloodstream infections in pediatric patients. A gold and standard way to detection the etiological agents of infectious diseases is blood culture and it is an only way to help in choice of appropriate and effective antibiotic.

Positive cases of bloodstream infections in children inpatients was 19.5%, and this is close to the results of studies carried out by Jyothi P. *et al.*, Jhajhria A. *et al.*, Kante M. *et al.*, Vijaya D. A. *et al.*, Qureshi M. *et al.*, and Mehta M. *et al.*, Who reported the following percentage respectively 19.2, 18.75, 17, 16.8, 16.6, and 16.4, many of the inpatients may be received antibiotics before specimen collection is the most effective reason could be explained the low percentage of isolation, in spite of that, Bhatt S. K. *et al.*, and Bolat F. *et al.*, reported high
percentages of bloodstream infections (55.6% and 43% respectively), at the time that, lower percentages were reported via Raheja P. et al (8%) and Pratham R. et al. (10.93%).

A male was predominance with male:female ratio of 2.5:1, other studies by Mythri H. and Kashinath K. R., Raheja P. and Jyothi P. reported 3.5:1, 2.8:1 and 1.9:1 respectively, the fact of attention given to the male infants and also because of greater number of male births in contrast to female maybe can explain the high rates of infection among male children (14).

Most of the bloodstream infections cases were in 31 days – 12 months (48.64%) than other age groups. High rates of infections in infants reported by Jhajhria A. et al (57.3%) and Bichitranaanda S. et al. (50%). The high rate of infections in infants may be due to their weak immune system and most infants take medication intravenously, that may introduce bacteria into their blood stream via medical devices, (2) bottle feeding and birth at home are sensible reasons to contaminate the infants easily and get infections.

In current study, common bacterial causative agent was Staph. aureus followed by CoNS, Klebsiella pneumoniae, Pseudomonas aeruginosa, E. coli, Acinetobacter sp., and Streptococcus pyogenes. (fig. 1) These results were consistent with previous local studies published by Al- Saqar et. al, and Arabi N. & Mojahid R. Increasing CoNS isolation in blood culture may also reflect a change of regarding CoNS as normal flora. Many factors such as prolonged use of intravascular devices, prolonged hospital stay, or other underlying co-morbidities might be increasing bloodstream infections due to CoNS. (9) Gram-negative bacteria have been reported as the commonest cause of bacteremia in hospitalized patients, the probable reason for that could be because it commonly found in the hospital environment, which might be contaminate among inpatients and increase the infection rates (11).

Because of increasing and randomly use of antibiotics, there has been emergence of antibiotics resistance among bacteria. Therefore, the second purpose of this study was to determine antibiotics susceptibility levels among bacteria causing bloodstream infections to commonly used antibiotics. Figure 2 shows that maximum susceptibility was to Ceftazidime, Amikacin, Ceftriaxone, and Vancomycin, while maximum resistance was to Erythromycin, Penicillin G, and Cefotaxime. Staph. aureus was highly susceptible for Cefuroxime, Amikacin, and Cefuroxime, and the high resistance value of it was to Cefotaxime and Vancomycin. CoNS isolates were susceptible for Cefuroxime, Amikacin, Vancomycin, Ceftazidime. while Streptococcus pyogenes isolate was susceptible for Amikacin, Cefuroxime, Cefotaxime, Ceftazidime, Norfloxacin, and Ceftriaxone. Klebsiella pneumoniae was susceptible for Ciprofloxacin, Vancomycin, Ceftriaxone, and Amikacin, and there was high resistance value to Cefotaxime. Pseudomonas aeruginosa was susceptible for Ciprofloxacin, and Ceftazidime, and it was resistant to Cefodizime, Cefuroxime and Cefotaxime. E. coli isolates were susceptible for Amikacin, Vancomycin, Cefuroxime, and Cefotaxime. While the tow isolates of Acinetobacter sp. were susceptible for Amikacin, Cefodizime, Vancomycin, Cefotaxime, Ceftazidime, and Ciprofloxacin. As articulate from the results of current and previous studies, (8,14,15,20,21) injudicious and widespread use of antibiotics had been increased the risk of emergence of multi-drug resistant organisms and furthermore spread of such strains, which not only increases the total cost of treatment but also morbidity and mortality.

Conclusions

The predominant causative agents of bloodstream infection in children inpatients was staph. aureus and CoNS followed by K. pneumoniae and P. aeruginosa. Whereas Ceftazidime, Amikacin, Ceftriaxone, and Vancomycin were most effective antibiotics, while maximum resistance was to Erythromycin, Penicillin G, and Cefotaxime. A male and 31 days – 12 months age group were more likely to suffering from bloodstream infections.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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REFERENCES


Association of Follicle Stimulating Hormone Receptor Gene Asn680ser Polymorphism with Polycystic Ovary Syndrome in Iraqi Women

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a polygenic multifactorial status affecting millions of females worldwide. It is a common cause of anovulatory subfertility.

This study aim to investigate the potential association between the follicle-stimulating hormone receptor (FSHR) gene Asn680Ser (rs6166) single nucleotide polymorphism with PCOS in Iraqi women.

A case-control study including 135 Iraqi women of Arab ethnicity (75 PCOS patients and 60 age-matched control women). The age of subjects ranged from 18 to 38 years. PCOS diagnosis was established by Rotterdam consensus criteria. FSHR gene (Asn680Ser) variant was tested by polymerase chain reaction–restriction fragment length polymorphism followed by deoxyribonucleic acid (DNA) sequencing.

In the present study, the A (Asn) allele and homozygote AA (Asn/Asn) genotype of the FSHR gene Asn680Ser polymorphism had significant risk (P=0.004 and p= 0.005 respectively) of developing PCOS in Iraqi women. On the contrary, the G (Ser) allele and the heterozygote AG (Asn/Ser) genotype gave a significant (P=0.004 and P=0.026 respectively) protective factor from developing PCOS in Iraqi women. Sequencing analysis of DNA confirmed restriction fragment length polymorphism analysis.

The variant Asn680Ser of the FSHR gene is associated with risk of PCOS development and may consider as the causal factor of PCOS in Iraqi women.

Keywords: FSH receptor, Asn680Ser (rs6166) polymorphism, PCOS, Iraqi women.

Introduction

Polycystic ovary syndrome (PCOS) is a polygenic multifactorial condition affecting millions of women worldwide. It is a common cause of WHO group 2 ovulation disorders that accounts for 80% to 90% of anovulatory subfertility(1). PCOS prevalence is specified, by the diagnostic criteria, ethnicity, and population of women studied (1, 2). Diagnosis of PCOS is based on Rotterdam consensus criteria (3). The pathogenesis of PCOS is multifactorial and far from being fully understood. It has been deduced that PCOS can be a familial in origin resulted by a mixture of genetic with environmental agents (4, 5). A major collection of studies has been dedicated to fixing the genetic causes of PCOS looking, especially, the release and action of gonadotrophin, secretion and action of insulin and other genes that had interest with regard to PCOS (6–8). Since follicle-stimulating hormone receptor (FSHR) has been identified as an important vulnerability locus in many genome-wide association studies, there have been multiple researches on FSHR polymorphisms (6, 8, 9).

Follicle-stimulating hormone (FSH) is an important agent in human reproduction, boost proliferation and discrimination of the granulosa cell in addition to the estrogen production (10). It acts by joining to the FSHR that found on the ovarian granulosa cell surface. The FSHR is encoded by the FSHR gene that present on the short arm (p) of chromosome two (2p21-16) (11, 12).

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Various single nucleotide polymorphisms (SNPs) of the FSHR gene have been found in different populations. Of these, two SNPs present in exon ten at nucleotide position 919 (Thr307Ala) and nucleotide position 2039 (Asn680Ser) are widely studied to determine the FSHR response to FSH stimulation and to portend the risk of PCOS development (13). In particular, the Asn680Ser SNP has received special attention. The Asn680Ser (rs6166) is situated in intracellular domain of FSHR at codon position 680 which can be taken either by asparagine (Asn=AAT) or by serine (Ser=AGT) (11). Because of the prevalence of PCOS and clinical features and the frequency of FSHR polymorphisms vary among different races of population (2, 14), So, the aim of this study was to investigate the potential association between the FSHR gene Asn680Ser (rs6166) SNP with PCOS in Iraqi women.

**Materials and Method**

A case-control study was conducted at the Higher Institute of Infertility Diagnosis and Assisted Reproductive Technologies/Al-Nahrain University (Baghdad, Iraq) from February 2017 to February 2018. This work was approved by the Local Medical Ethical Committee of the High Institute of Infertility Diagnosis and Assisted Reproductive Technologies/Al-Nahrain University. Each woman that participates in the present study signed a consent form. A total of 135 Iraqi women were studied. All women were of Arab ethnicity and were matched according to age. The age of subjects ranged from 18 to 38 years. Two groups were enrolled in this study. The first was seventy five PCOS patients group were chosen from those women who attended the Higher Institute of Infertility Diagnosis and Assisted Reproductive Technologies. The PCOS women were chosen based on the Rotterdam criteria (3). The enrolled women were only those who had polycystic ovaries on transvaginal sonography to ensure that the phenotype was definitely PCOS.

The second group was the control group, which included 60 healthy women were chosen from those women who attended the Higher Institute of Infertility Diagnosis and Assisted Reproductive Technologies and Al-Imamian Al-Kadhimiya in Medical City (Baghdad/ Iraq), with normal menstrual cycles, no clinical appearance of hirsutism, acne and alopecia, normal basic endocrine detection results, transvaginal sonography revealed no polycystic manifestations and no family history of PCOS.

**Genotype Analysis:** For DNA isolation from all the subjects, two and half milliliters of venous blood were collected in K2-EDTA collecting tube containing EDTA as anticoagulant. According to the protocol of G-spin™ Kit (Intron - Korea), genomic DNA was isolated from venous whole blood. After genomic DNA extraction, agarose gel electrophoresis was selected to confirm the presence and integrity of the extracted DNA (15) (Figure 1.A). In addition, all the extracted DNA samples were tested to estimate the genomic DNA concentration and purity by BioSpec-nano spectrophotometer (Shimadzu/ Japan). Restriction fragment length polymorphism (RFLP) technique was used to detect Asn680Ser SNP (2039 G>A) (16). A 520 base pair (bp) fragment of FSHR was magnifying by conventional polymerase chain reaction (PCR) utilizing the next primers (Integrated DNA technologies/USA):

**Forward primer:** 5'-TTTGTGGTCATCTGTGGCTGC- 3'

**Reversed primer:** 5'-CAAAGGCAAGGACTGAATTATCATT - 3'

Conventional PCR was done by using a MultiGene™ OptiMax Thermal Cycler (USA- Labnet), in overall volume of 25 μl mixture including: 1.5 μl of DNA; 1 μl of every primer, 5 μl Maxime PCR Premix (i-Taq) manufactured by (Intron/Korea) and 16.5 μl double distilled water. The Thermal Cycler was adjusted for PCR status as the following steps: an initial denaturation step of 3 min at 95°C followed by 34 cycles of denaturation at 95°C for 45 sec, annealing at 62°C for 35 sec and initial elongation step at 72°C for 45sec and a final elongation step at 72°C for 7 min.

All PCR products (Figure 1.B) were subjected to restriction enzyme digestion. The 520 bp amplified PCR product was digested with BsrI (Biolab/New England). Digestion was performed in 10μl reaction volume containing 4.5μl reaction buffer, 0.5 μl of restriction enzyme and 5 μl of purified PCR product, incubated at 65°C/45min.

The evaluation of PCR and enzyme digested products were done by gel electrophoresis (2%) that visualized by UV trans-illuminator illuminator (Vilberlourmat-France). Digestion with restriction enzyme Bsr I gave
3 diverse patterns for 2039 G→A substitution: bands of 520 bp in case of Asn680Asn (AA) genotype, 413/107 bp in Ser680Ser (GG) genotype and 520/413/107 bp in Asn680Ser (AG) genotype were observed (Figure 1.C). To verify genotyping results in RFLP, 20 samples (randomly selected from all samples processed) of PCR products and forward primers were sent to South Korea (Macrogen Company) for DNA sequencing.

Figure 1: (A) Gel electrophoresis of genomic DNA extraction from blood. 1% agarose gel, 70 volts, and 65 ampere at 1 hour, visualized under UV light after staining with red safe staining. (B) Agarose gel electrophoresis of PCR products for FSHR Gene (Asn680Ser). The PCR amplified fragment of molecular size of 520 bp. (C) The PCR products after digestion with Bsr I: (AA genotype = 520 bp); (GG genotype = 413 bp and 107 bp); (AG genotype = 520 bp, 413 bp and 107 bp). The PCR and enzyme digested products were electrophoresis on 2% agarose for 1:30 hours. M=DNA ladder 100bp.
Data and Statistical Analysis: Statistical analysis was performed utilizing SPSS Statistics Version 23.0. Fisher exact test was utilized to show the significance of difference among the frequencies (alleles and genotypes) of study groups. Odds ratio (OR) and 95% confidence interval (CI) were achieved to estimate the association among the groups. Significance of tests was specified at P value $\leq$ 0.05.

Results

In the current study, the Asn680Ser variant of the FSHR gene was screened among 135 women (75 PCOS patients and 60 healthy controls). The age range for both PCOS patients and controls was 18 to 38 years with a mean of 26.0 ± 0.51 (mean ± SE) for PCOS and a mean of 26.7 ± 0.51 (mean ± SE) for controls. In the present study, no significant difference (P>0.05) in the age was observed between the two groups.

The allele and genotype frequencies of FSHR Asn680Ser SNP in all subjects were assessed (Table 1). In the present study, there was a significant (P value=0.004) difference in distribution of alleles, Asn (A) and Ser (G) between PCOS patients and control groups. The A allele frequency was (82.7% in PCOS patients versus 67.5% in control group), the OR for such a positive relation was 2.3 with etiological fraction (EF) = 0.46. The genotypes analysis of Asn680Ser SNP showed that the homozygote mutant AA genotype showed a significant (P value=0.005) higher frequency in PCOS patients than in controls (80.0% and 56.7%, respectively), the OR for such a positive relation was 3.06 with EF was 0.53. On the contrary, the G allele and heterozygote AG genotype significantly (P=0.004 and P=0.026 respectively) more frequent in the control group than the PCOS patients group, the OR for such a positive relation were (0.44 and 0.25 respectively) with preventive fraction (PF) = (0.18 and 0.13 respectively). No significant (P value = 0.187) difference was observed in the distribution of the homozygote wild GG genotype among the PCOS and controls (14.7% versus 25.0%, OR=0.52, 95% CI=0.22-1.22). Sequencing analysis of DNA confirms RFLP analysis as shown in Figure 2. The exon ten sequence of the FSHR gene was submitted to the Gene Bank National Center Biotechnology Information (NCBI) under the accession number (MH910500.1).

![Figure 2: Sequencing analysis for exon ten of FSHR gene (Asn680Ser): (AA genotype=one peak), (AG genotype=two peaks) and (GG genotype=one peak) as indicated by arrows.](image)
Discussion

Since the cause of anovulation in PCOS may be due to defects in the early stages of folliculogenesis (17). Therefore, the correlation among FSHR gene SNPs and this syndrome has been widely investigated across different races with inconsistent results. In the present study, the A allele and homozygote mutant AA genotype gave a significant risk of PCOS development among women in Iraq. On the contrary, the G allele and the heterozygote AG genotype gave a significant protective factor from developing PCOS in Iraqi women. This is in agreement with previous studies conducted between different races and also confirmed a significant increase in frequency in the Asn680Ser variant. Sujatha et al. have stated that the A allele and homozygote AA genotype gave a significant risk of PCOS development among women in India (18). In addition, the presence of significant differences in the allele distribution of Asn680Ser SNP in women with PCOS was proven between Iranian women (19) and Korean women (20, 21). On the contrary, the presence of significant risk of PCOS development was not proven between Turkish population (22, 23), Northern Chinese Han women (24) and among Bahraini Arab women (25).

The differences of results that observed in multiple studies may be due to a different PCOS definition and sample size. Moreover, PCOS is a complex and diverse disorder which results from interaction of genetic and environmental agents (26, 27). Therefore, the prevalence and the differences in phenotypes in PCOS women in various populations may be affected by regional and ethnic setting (27-29).

Conclusion

The A allele and homozygote AA genotype of the Asn680Ser variant of the FSHR gene is associated with risk of PCOS development. On the contrary, the G allele and heterozygote AG genotype is a preventive one. So the Asn680Ser variant of the FSHR gene is associated with risk of PCOS development and may consider as the causal factor of PCOS in Iraqi women.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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REFERENCES


Optimization of L-Glutaminase Enzyme Production by 
Staphylococcus Aureus Clinical Samples

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ABSTRACT

L-glutaminase produced from staphylococcus aureus. Where, a 108 sample of bacterial isolates collected from clinical source. S. aureus identified by biochemical test and differential medium. The ability of these isolates for L-glutaminase production was examined. Results showed that of S. aureus isolate were L-glutaminase producers with different degrees. Among them S. aureus S22 was the most efficient in enzyme production and the specific activity of L-glutaminase in its crude was 4.1 U/mg. Upon studying the optimum condition for enzyme production.

Keywords: clinical samples, L-Glutaminase enzyme, Staphylococcus aureus

Introduction

L-glutaminase (L-Glutaminate amidohydrolase EC 3.5.1.2), L-glutaminase occur in wide range of living organism both microorganism (bacteria and fungi) and higher organism (plant and mammalian) (²). L-glutaminase acts to breakdown l-glutamine and converted it to glutamic acid and ammonia group) (¹, ³). The amino acid l-glutamine is considered as very important essential amino acid for cancer cells since these cells lose the mechanism of l-glutamine synthesis which present in normal cells (¹, ³, ⁶) the proliferation of cancer cells blocked when the L-glutamine Depleted from cancer cells environment. The anticancer activity of L-glutaminase tested on multi types of cancer such as breast cancer (³, ⁷), liver cancer (⁷) and others. In addition to l-glutaminase anti-cancer activity, this enzyme used in food industry as flavor enhancer and in biosensor for monitoring glutamine level in mammalian cell culture (⁴). In biosensor L-glutaminase used for healthy monitoring and clinical diagnostic which achieved by analysis of glutamate and glutamine level in body fluid. L-glutaminase used as both free enzyme of immobilized form as biosensor for monitoring glutamine and glutamate level (⁵).

Materials and Method

Sample Collection: Bacterial samples (108 isolates) of burns, wounds and urine infections were collected aseptically from Al-Sader hospital, private analyzer laboratory in Baghdad and AL-Najaf city. Swap specimens transferred to laboratory under cooling conditions. Specimens were inoculated to mannitol salt agar (MSA), chrome agar, and blood agar media then incubated for 24-48h at 37°C under aerobic conditions. All the primary screened isolates then subjected to various morphological and biochemical tests to ensure their identity⁸.

Semi Quantitative Screening: The isolated S. aureus were subjected to rapid screening for L-glutaminase production by agar plate assay. Bacterial isolates were grown on minimal salt medium (KCl.7H₂O 0.5g/l, MgSO₄.7H₂O 0.5g/l, ZnSO₄.7H₂O 1.0 g/l, KH₂PO₄ 1.0 g/l and L-glutamine 5.0 g/l in pH 6.7) with 2.5% phenol red dye and incubated for 48h at 37°C. Change in pH caused change the color of plate from yellow to pink, which indicated a positive result (⁹).

Quantitative Screening of L-glutaminase

Preparation of cell free supernatant: S. aureus was grown in 250 ml minimal salt media at 37°C for 48h. The culture was centrifuged for 30 minutes at 6,000 rpm, and cell free supernatant was used as crude enzyme.
L-glutaminase activity assay method: L-glutaminase activity was assayed as follows: A reaction mixture containing 10 μl of 0.04 M L-glutamine, 10μl of 0.5 M Tris buffer, 10 μl of enzyme, and D.W to a final volume of 40 μl. The mixture was incubated in water bath for 30 min at 37 °C and the reaction was stopped by adding 10μl of 10% trichloroacetic acid (TCA). Blank was prepared by adding TCA before the addition of enzyme. Mixture reaction (25μl) was taken and the volume was completed to 1ml using D.W, then 50μl of Nessler’s reagent was added. The mixture was kept for 20 min at 25°C, then the absorbance at 450 nm was measured, and the amount of released ammonia was determined [21]. One International Unit (IU) of L-glutaminase is the amount of enzyme which liberates 1μmol of ammonia per minute per ml [μmole/ml/min].

Determination of protein concentration: Protein concentration was determined according to the method of Bradford (10).

Optimum conditions for L-glutaminase production: Optimum conditions for L-glutaminase produced by selected isolate were determined by inoculating 100 ml of the minimal salt medium pH 6.7 with 1.0 ml of fresh culture (OD =0.6) of the bacterial isolate and incubated for 24 h at 37°C, then L-glutaminase activity and protein concentration in crude extract were estimated. Optimum factor when reached was used in the next experiment of optimization.

Optimum carbon source: Various carbon sources (starch, glucose, maltose, sucrose and sugar) were added, individually, to the production medium. The final concentrations of all these carbon sources were 0.1 %. L-glutaminase activity, protein concentration and specific activity were determined.

Optimum Nitrogen Source: Various nitrogen sources (casein, meat extract, yeast extract, tryptone) were added individually to the production medium supplemented with optimum carbone source from the previous step at a final concentration of 0.1%. As in the previous step, L-glutaminase activity, protein concentration and specific activity were determined.

Optimum pH: Optimal pH for production of L-glutaminase was determined by adjusting the pH of the production medium to different values (5, 6, 7, 8, 9, and 10), then incubated for 24 h at 37°C. L-glutaminase activity, protein concentration and specific activity were determined.

Optimum temperature: The production medium was inoculated with the selected S. aureus and incubated at different temperatures (25, 30, 37 and 42°C). The optimum temperature for L-glutaminase production was used in the next experiment of optimization.

Optimum incubation period: Effect of incubation period on L-glutaminase production by S. aureus was studied by incubating the production medium at various periods of time (24, 48, 72 and 96 hr.) to determine the optimum period for enzyme production.

Results

Isolation and identification of Staphylococcus aureus: A total of 108 clinical samples were collected from burns, wounds and urine infections, of which 95 isolates produced yellow colonies on MSA media which is typical characteristic of S. aureus [11]. and gray colonies were observed for the same isolates when cultured on chrome agar which is differential media prevent the growth of all bacterial isolates except S. aureus [12, 14]. When these bacterial isolates grown on blood agar media β-hemolysis around their colonies were produced [11]. The primary biochemical test for these isolates showed in table (1). These characteristics came in accordance with cultural characteristics of S. aureus [8].

<table>
<thead>
<tr>
<th>Identification tests</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram stain</td>
<td>+</td>
</tr>
<tr>
<td>Catalase test</td>
<td>+</td>
</tr>
<tr>
<td>Oxidase test</td>
<td>-</td>
</tr>
<tr>
<td>Coagulase test</td>
<td>+</td>
</tr>
</tbody>
</table>

Semi quantitative screening: The semi quantitative screening for l-glutaminase production was done by agar plate assay method. Results showed that the pink color directly related to the quantity of enzyme produced. However, among the 95 bacterial isolates, four isolates showed positive result, S. aureus S22 can be considered as the highest l-glutaminase producer which gave clear pink zone when compared to the other isolates (Figure 1). In minimal glutamine agar, l-glutamine amino acid was the only carbon and nitrogen source, so the organisms capable of producing L-glutaminase would be able to grow on this media. The pH indicator shows colour change from yellow to pink. Appeared of pink zone around colonies related with l-glutaminase enzyme action that disrupted l-glutamine amino acid and release ammonia, which raised pH number (9, 13).
Figure 1: Agar plate assay for qualitative screening of *Staphylococcus aureus* l-glutaminase production were incubated for 48 h at 37°C

A. The plate that inoculated with S22 and incubated for 48 h at 37°C.

B. Blank plate uncultured and incubated 48 h at 37°C

Quantitative screening of *S. aureus* isolates producing l-glutaminase: Upon qualitative screening, the specific activity of L-glutaminase in the crude of the four local *S. aureus* isolates was determined. Result (Table 2) showed that all the isolates were L-glutaminase producers with variable degree of production. The isolate S22 gave the highest specific activity (4.1U/mg) protein. Moreover, isolate S25 showed the lowest specific activity (0.9 U/mg) protein. According to these results, the isolate S22 was selected to be used for improving its ability in L-glutaminase production by optimization.

Table 2: Specific activity of l-glutaminase produced by local isolates of *Staphylococcus aureus* after 48hrs of incubation at 37°C

<table>
<thead>
<tr>
<th><em>Staphylococcus aureus</em> isolates symbol</th>
<th>Specific activity (U/mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S6</td>
<td>1.3</td>
</tr>
<tr>
<td>S22</td>
<td>4.1</td>
</tr>
<tr>
<td>S25</td>
<td>0.9</td>
</tr>
<tr>
<td>S100</td>
<td>1.2</td>
</tr>
</tbody>
</table>

The differences between isolates in the ability for enzyme production could be due to genetic variations of the genes responsible for the production of this enzyme15.

Optimum conditions for l-glutaminase production: The production of l- glutaminase by the most efficient *S. aureus* isolate S22 was optimized using one factor at a time variable and keeping the other factors constant

Optimal Carbon Source: Five carbon sources (starch, glucose, maltose, sucrose and sugar) were used as a optimum source for carbon and energy to determine the optimum for production of l-glutaminase by *S. aureus* S 22. All these carbon sources were added separately to minimal salt medium in a concentration of 0.1 % w/v. Results showed that, the maximum production of l-glutaminase by *S. aureus* S 22 was achieved when starch was used as a source for carbon and energy which gave highest L-glutaminase specific activity of (13.8 U/mg) followed by glucose (10.9U/mg), maltose (9.3 U/mg), sugar (7.6U/mg) and sucrose (5.2 U/mg) figure (2).

![Figure 2: Optimum carbon source for L-glutaminase produced by Staphylococcus aureus S22 after incubation at 37°C for 48 h.](image)

Optimum Nitrogen Source: Nitrogen sources includes yeast extract, meat extract, casein and tryptone were added to the production medium separately in a concentration of 0.1%. Maximum production of l-glutaminase was achieved when the production medium was supplemented with meat extract because enzyme specific activity reached 18.3U/mg protein when this nitrogen source was used (Figure 3). This result related to the fact that meat extract is easier to utilized by this bacterium than the other nitrogen sources to achieve requirements for growth, cell division and production of l-glutaminase and different metabolites. Another previous studies showed that tryptone was the optimum nitrogen source for *Providencia sp.* L-glutaminase production (16).

![Figure 3: Optimum nitrogen source for L-glutaminase produced by Staphylococcus aureus S22 after incubation at 37°C for 48 hrs.](image)
Optimum pH: The initial medium pH was adjusted in a range between pH 5 to pH 10, the maximum L-glutaminase production was obtained when the pH value of the production medium was adjusted to 8, at this value the enzyme specific activity recorded 24.6 U/mg protein (Figure 4).

The three-dimensional structure of proteins related with hydrogen ions (H+) concentration because any change in H+ and/or OH-compete with hydrogen bonds and ionic bonds in an protein, resulting in protein denaturation (17). Also, the pH effect on the stability of the produced enzyme, solubility of the nutritional materials and substrate ionization (18).

Optimum incubation temperature: Different incubation temperatures used in this study (25, 30, 37 and 42°C) to determine optimum temperature for L-glutaminase produced by S. aureus, the results showed that maximum production of L-glutaminase was occurred when the microorganism was grown at 37°C for 48h, with specific activity of 24.9 U/mg (Figure 5). At any enzymatic reaction temperature above or below the optimal will drastically reduce the rate of reaction. This may be lead to enzyme denaturation or to losing its three-dimensional structure. Denaturation of a protein means the breakage of hydrogen bonds and non-covalent bonds (17). Z. rouxii produced L-glutaminase at the same temperature too (16). The optimum temperature for synthesis of the enzyme from P. fluorescens was 37°C (19).

Optimum incubation period: L-glutaminase production by locally isolated S. aureus S22 was determined after different incubation periods (24, 48, 72 and 96hrs). Results in Figure (6) indicated that the enzyme production started at 24 hours, with specific activity of 11.4 U/mg. until it reached to the maximum enzyme production at 48 hours, and the specific activity of 26.3 U/mg. After that, activity of enzyme was decreased to 6.3 U/mg after 96 hours of incubation.

The possible reason for decrease in L-glutaminase production after 72 hr may be due to reduction of nutrients in the medium, assemblage of excess acid in the media because of sugar utilization and developed oxygen tension. or maybe attributed to assemblage of acetate which is inhibitory to cell growth and generation of toxic products that often decreased protein yields (20).

Conclusion

L-glutaminase production was increased when the medium supplemented with 0.1% starch and 0.1% meat extract (pH 8.0) and incubated at 37°C for 48 hours. Under
these conditions, the specific activity of L-glutaminase produced in culture medium was to 26.3 U/mg protein.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Serologic Study to Detect a Relation between Myocardial Infarction Diseases and *Helicobacter pylori* Infections in Baqubah City, Iraq

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ABSTRACT

Myocardial infarction (CAD) is known as the main cause of death in developed and developing countries. A relation between this disease and *Helicobacter pylori* has been displayed in several studies. The purpose of this study was to determine the relationship between *H. pylori* infection and myocardial infarctions diseases.

Methods: 72 myocardial infarction patients as well as 20 Control samples. Levels of serum IgM antibodies against *H. pylori* were measured by ELIZA technique while IgG antibodies by Rapid Cassette test (CAS), also the blood samples were collected sent to rapid tests of CRP – Latex test as an indicator.

From 92 participants, 72 were patients and 20 were control subjects. The percentage of IgM positive cases against *H. pylori* was 86.11% in the case group and 45% in the control group (p: 0.29), while (52.7%) in the case group and (60 %) in the control group were positive to antiHP IgG (p=0.53). according to statistical data, this study showed no significant association between myocardial infarction disease & *H. pylori* infection (P > 0.05).

Keywords: *H. pylori*, Myocardial infarction (MI), antiHP IgM, IgG.

Introduction

*Helicobacter Pylori* was imparted to the world consideration 1983 by Warren and Morshall, it is now recognized that *H. pylori* gastritis is the commonest chronic human bacterial infectious diseases. Although *H. pylori* are asymptomatic they are thoroughly causally related with benign stomach disorders such as peptic ulcer, gastritis disease and malignant gastric conditions such as gastric mucosa-associated lymphoid tissues (¹) Serological signs indicate that 50 % of the adults in developing and developed populations are infected. *H. pylori* colonize the less acidic antrum of the stomach¹², ³. *H. pylori* infections have been recognized to play a vital part in the pathogenesis of diabetes mellitus type two⁴, ⁵.

The effects of *H. pylori* in the pathogenesis of myocardial infarction diseases still remained controversial. In recent years, Several epidemiologic and clinical evidence have recommended the roles of sustained and severe inflammations in emerging atherosclerotic lesions⁶. Inflammations as a response to irritation, oxidative degradation of lipids, or infections are considered majors cardiovascular risk factors⁷. It has been suggested that determined low-grade inflammatory responses that resulting from chronic gastritis *H. pylori* disorders may increase the level of some coagulation factors, such as fibrinogen, which are the indicator of ischemic heart diseases⁸. *H. pylori* with other microorganisms have a main role in the atherosclerotic plaque development by specific and nonspecific mechanisms such as increased clotting ability, increased the formation of adhesion molecules⁹. *H. pylori* is helicoidally spiral-shaped, a gram-negative rod, a unipolar and microaerophilic bacterium. it is characterized by the production of urease, via ammonia production, thus have the opportunity to survive by creating a pH more than that of gastric mucous¹⁰.
Materials and Method

Blood Collection: This study enrolled 92 samples (60 male and 32 female), 20 individuals control study (No history of Cardiovascular diseases) 72 myocardial infarction patients their ages between (40-80) years old, all of them attending the Emergency room and consultation clinics of Baqubah Teaching Hospital and Balad Ruz general hospital at Diyala province from 5/9/2017 to 5/4/2018. Patients with the myocardial infarction in the common clinical forms (unstable angina UA, hypertension diseases), A questionnaire was directed to those patients entered including the history of hypertension, diabetes mellitus, smoking, and coronary artery diseases and Negative history of (gastritis, duodenal ulcer, and gastric ulcer). The blood samples were collected sent to rapid tests of CRP – Latex test. Blood samples (5 ccs) were obtained and sent to the refrigerator at -20°C at the test time.

Detection of H. pylori antibodies: ELISA IgM kit DEHELO3 designer for the quantitative detection of IgM class antibodies against H. pylori in human serum or plasma. Microtiter strip wells are precoated with H. pylori antigen to bind matching antibodies of the specimen.

Statistical Analysis: Statistical Descriptive analysis (Mean, SD, SE, and percentage) was done to describe data, two independent samples T-test, (F-test), correlation analysis was applied (12).

Results

A total of (72) patients were enrolled in the study, 60 (65.12%) male and 32 (34.7%) female (Figure 1).

Table 1: The Percentage of CRP test in all patients

<table>
<thead>
<tr>
<th>CRP test</th>
<th>Positive</th>
<th>%</th>
<th>Negative</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>35</td>
<td>58.4</td>
<td>25</td>
<td>61.6</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>62.5</td>
<td>12</td>
<td>37.5</td>
</tr>
</tbody>
</table>

Analysis of those patients with positive tests revealed the followings: - For antiHP IgM showed that 62 (86.11%) of the Myocardial patients had positive results, while 10 (13.98%) had negative tests for IgM, while the control cases results showed 9 (45%) had positive results and 11 (55%) had negative tests for IgM. for antiHPIgG showed that 38 (52.7%) had positive results while 34 (47.3%) had negative tests while the control cases results showed 12 (60%) had positive results and 8 (40%) had negative tests for IgG (Table 2).

Table 2: Distribution of of H. pylori Ab IgM, IgG In all Patients

<table>
<thead>
<tr>
<th>Anti H. pylori AB</th>
<th>Negative N(%)</th>
<th>Positive N(%)</th>
<th>Total N(%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgM</td>
<td>10 (13.89)</td>
<td>62 (86.11)</td>
<td>72 (100)</td>
<td>0.29</td>
</tr>
<tr>
<td>Healthy Control</td>
<td>11 (55)</td>
<td>9 (45)</td>
<td>20 (100)</td>
<td></td>
</tr>
<tr>
<td>IgG</td>
<td>34 (47.3%)</td>
<td>38 (52.7%)</td>
<td>72 (100)</td>
<td>0.53</td>
</tr>
<tr>
<td>Healthy Control</td>
<td>8 (40%)</td>
<td>12 (60%)</td>
<td>20 (100)</td>
<td></td>
</tr>
</tbody>
</table>

Table (3) show the incidence of H. pylori IgM antibody positive according to age; the results show (100%) of patients with positive results was within sixth decade of life. Statistically, there was no significant difference between the studied groups.

Table 3: The age group variation with positive anti H. pylori antibody

<table>
<thead>
<tr>
<th>2</th>
<th>+ ve antiHP IgM</th>
<th>+ ve antiHP IgG</th>
<th>+ ve antiHP IgM</th>
<th>+ ve antiHP IgG</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 - 39</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>40 – 49</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
The table (3) as shown about 48.3% of patients with Anti IgG and IgM positive results was within fifth decade of life.

**Discussion**

Since *H. pylori* infect the individuals induces the formation of antibodies. Sero-diagnostic tests provide the rapidity, sensitivity, and specificity detection of *H. pylori* (13, 14). *H. pylori* incidence differs in relation to various factors such as geography, age, and economic factors — high in developing countries and lower in the developed world (15, 16). Some studies have shown male predominance in infection (17-19). The incidence of Anti *H. pylori* was highest in the youngest group of <30 years (96.7%), Which may indicate the acquisition of hostility during childhood. In our study, no significant difference in *H. pylori* IgM levels was presented between cases and controls (p=0.29). Patients with MI with positive antiHP IgM was (86.11%) while (52.7%) for antiHP IgG. MI compared with positive antiHP IgM and IgG were statistically no significant differences showed. In Iraq to date, very little studies that show the association between H pylori infections and myocardial infarction disease, so this result was Converged from Azarkar, et.al. that revealed antiHP IgG positivity was (57. 5%) and different from a study was performed by Altaae that revealed antiHP positivity was 38.57 % in CVD. (20, 21). *H. pylori* infections upsurge the production of several metabolites, such as cytokines, that affect the blood flow in vessels and Resulting in its endothelial dysfunction and shrinkage of tiny vessels (22-24). Increase the proportion of fibrinogen lead to in the gastric mucosa of *H. pylori*-infected individuals could increase serum fibrinogen and leukocytes, It appears that the immune response and related reactions in patients with *H. pylori* infection can be demonstrated Accompany this infection and some cardiovascular diseases (25, 26). Finally, this evidence may be consistent with the increase observed in our study of the prevalence of *H. pylori* antibodies among MI patients.

**Conclusions**

1. The prevalence of positive antiHP antibodies was higher in patients Myocardial infraction.
2. Gender disparities are present in our study of patients with positive antiHP patients.
3. The prevalence of antiHP antibodies increases with the rise in the average age.

**Acknowledgments**

We are thankful to the Baqubah technical Institute - for helping us in accomplishing this research.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Assessment of Some Hematological Parameter in People with Hair Loss

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1Department of Pathological Analysis Techniques, Al-Safwa University College, Kerbala, Iraq

ABSTRACT
Hair loss is a common problem in the Iraqi society. To study its causes, 30 people suffering from hair loss were selected, with ages ranging from 18-50 years and of both sexes compared to 10 healthy people. Blood samples were collected from the persons under investigation; some tests were conducted on them, including: Total white blood cells, Hemoglobin (Hb) and level of Ferritin was measured. The study found that the highest percentage of hair loss is found in females by 73.3% compared to males by 26.6%. The result shown there was not significant decrease in WBCs in people suffering from hair loss by $7.115 \times 10^3/\mu l$ compared with control to $7.74 \times 10^3/\mu l$, while shown there are significant decrease level Hb which a record $11.18 \text{ g/dL}$ in people suffering from hair loss While in control about $13.2 \text{ g/dL}$. There was also a not significant decrease in the proportion of Fe in people suffering from hair loss by Ug/Dl 55.29 compared with the healthy group who recorded the ratio of Ug/Dl 59.29.

Keyword: Hair loss, Hemoglobin, ferritin

Introduction
Hair loss is a common problem that affects both males and females of all ages [1]. Hair loss is not just an aesthetic issue; the condition can also cause a great deal of psychological pain. While hair loss sufferers have long attributed their condition to factors like hormones and genetics, immunity [2].

Hair is a keratin protein filament that grows from follicles found in the dermis of skin [3]. The healthy adult scalp contains about 100,000 hairs, of which 90% are actively growing, hair follicles cycle through anagen, catagen and telogen phases showing in figure (1), since the vast majority of patients with hair disorders suffer from an undesired alteration of hair follicle cycling [4-6]. Thus, in a normal adult scalp, there are around 80-90% of hair in the anagen phase, 10-20% in the telogen phase and 1-2% in the catagen phase [7].

Figure 1: Hair Growth Cycle[4]

Reduction in hair thickness and density leads to a reduction in the overall hair volume (average hair thickness x number of hairs) due to many season such as endocrine causes, stressful events, nutritional causes, intoxication, drugs and Inflammatory scalp diseases, Iron deficiency & other, these causes a disruption in hair growth cycle and hair loss [8].

To study some of hair loss causes, we selected 30 people suffering from hair loss, with ages ranging from 18-50 years and of both sexes compared to 10 healthy people and that is through:

1. Blood samples were collected from the persons under investigation.

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Email: hudamk9911@gmail.com
2. Determination of hematological parameters
   A. Total white blood cells (WBCs).
   B. Hemoglobin (Hb).
3. Quantitative determination of Fe serum.

**Materials and Method**

**Samples:** The study method include 30 patients suffering from lost hair and 10 healthy as control with mean age of (50 ± 18) from both sex.

**Collection of Blood Samples:** About 5 ml of blood was withdrawn from the vein of the patients under this study by syringes, and the blood was divided into two parts. It placed 2 ml in the EDTA tube for CBC test and the remaining 3 ml from blood was placed in the gel tube and left the tube at room temperature for 15 minutes, then placed in the centrifuge for 10 minutes at 3000 rpm to separate the serum that was pulled by a pipette and used to measure the Fe ratio.

**Blood Test**

**Determination of hematological parameters:** The full count of blood (CBC) factory determine by Complete blood count (Sysmex Kx2In – Japan) Hematological analyzer.

**Quantitative determination of Ferritin serum:** The level of Fe measured by using i- CHROMA (Bodi Tech Med – Korea) device.

**Statistical Analysis:** Statistical analysis was performed of data using excel program in the computer where the mean value, standard deviation and Statistical significant of difference LSD and between two means were calculated at the level of probability of 0.05.

**Results and Discussion**

**Samples:** A total of 30 samples of people with hair loss were collected after being diagnosed by dermatologists at Hussein Teaching Hospital in the city of Karbala, 10 samples of healthy people were also collected for control with mean age of (50 ± 18) from both sex.

The study found that the highest percentage of hair loss is found in females by 73.3% (22 sample) compared to males by 26.6% (8 sample) as shown in the figure (2). Hair loss among women is a challenging common problem for Dermatologists; Hair loss affects more than 25% of women in developed countries \(^9\). In general, the main risk factors of loss hair are major illness, stress, nutritional deficiencies, medications, androgen and genetics basis in its etiology \(^10,11\).

![Figure 2: Percentage of hair loss among males and females](image)

**Determination of hematological parameters**

**Total white blood cells (WBCs)**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>WBCs (mean) *10^3/µl</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient NO = 30</td>
<td>7.115</td>
<td>2.02 ±</td>
</tr>
<tr>
<td>Control NO = 10</td>
<td>7.74</td>
<td>1.9 ±</td>
</tr>
<tr>
<td>LSD</td>
<td>0.991</td>
<td></td>
</tr>
</tbody>
</table>

The results for WBCs showed not significant decrease P-value> 0.05 (in these number of patient with hair loss by 7.115*10^3/µl compared to 7.74*10^3/ µl control, As shown in the table (1). According to a recent study, researchers found a correlation between certain immune system cells and the skin cells that enable hair to grow, macrophages a type of white blood cells can signal skin cells to produce hair. In a recent PLOS Biology study involving mice, researchers found that administering anti-inflammatory drugs had an effect on hair growth. By treating the macrophages, scientists were able to manipulate the cells into reactivating hair\(^{12}\).

In experiments in mice, UC San Francisco researchers have discovered that regulatory T cells a type of WBCs directly trigger stem cells in the skin to promote healthy hair growth. Without these immune cells as partners, the researchers found, the stem cells cannot
regenerate hair follicles, leading to baldness or hair loss, the other study suggests that defects in T-cell could be responsible for alopecia areata, a common autoimmune disorder that causes hair loss, and could potentially play a role in other forms of baldness, including male pattern baldness\textsuperscript{[13]}.

Table 2: concentration of Hb in study group

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Hb g/dL (mean)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient NO = 30</td>
<td>11.18*</td>
<td>3.39 ±</td>
</tr>
<tr>
<td>Control NO = 10</td>
<td>13.2</td>
<td>± 1.24</td>
</tr>
<tr>
<td>LSD</td>
<td>1.32</td>
<td></td>
</tr>
</tbody>
</table>

According to the results shown in table (2), there was a significant decrease (P-value<0.05) in the level of Hemoglobin (Hb) in people with hair loss 11.18 g/dL while in healthy people 13.2 g/dL, the results of this study were close to those found Elethawi & Jabbar in 2012 [14] which level a to Hemoglobin was ranged from 12.37 g/dl compare with control group by 12.19 g/dl, Hemoglobin (Hb) level may be within normal limits in women with iron deficiency and hair loss. This is because decreased iron stores in body will lead to hair shedding before the development of microcytic anemia\textsuperscript{[15]}.

Quantitative determination of Ferritin (Fe) serum:
Results showed that there was a not significant decrease (P-value> 0.05) in (Fe) serum by 55.29 Ug/Dl at people with hair loss compared to healthy people by 59.29 Ug/Dl. As shown in the table (3).

Table 3: Estimate the level of Fe serum in study group

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Fe Ug/Dl (mean)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient NO = 30</td>
<td>55.29</td>
<td>43.5 ±</td>
</tr>
<tr>
<td>Control NO = 10</td>
<td>59.29</td>
<td>34.6 ±</td>
</tr>
<tr>
<td>LSD</td>
<td>9.43</td>
<td></td>
</tr>
</tbody>
</table>

Hair follicles contain ferritin, decline of ferritin stores in the hair follicle affects the ability of the hair to grow and cause hair loss. Low ferritin levels also causes the hair to exhibit structural changes, dryness, an inability to hold curl or color well, and breakage\textsuperscript{[16]}.

Iron deficiency anemia is the most prevalent nutritional risk factor that faces the dermatologists in daily clinical practice\textsuperscript{[17]}. A serum Ferritin level is using for hair loss assessment and iron supplement is used routinely for hair loss treatment. In spite of this, other authors failed to prove that the iron has an effect on hair loss\textsuperscript{[18]}. Many observational studies have found the association between decreased Ferritin levels and hair loss\textsuperscript{[19-23, 1]}. The reason may be due to a fact that hair follicle matrix cells as the most rapidly proliferating cells in the body appear to have lower levels of Ferritin and higher levels of free iron\textsuperscript{[24]}.

Conclusions

1. There is a relationship between the level of ferritin & Hemoglobin in blood of people suffering from hair loss.

2. It also shows that the people with hair loss there decrease in the immune.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Group A B-Hemolytic Streptococci Infection among Children in Primary School in Samarra City

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Department of Pathological Analyses, College of Applied Sciences, University of Samarra, Iraq

ABSTRACT

Three hundred children aged (3–12) year (160 males and 140 females), presenting with acute pharyngitis to the pediatric and ear, nose, throat (ENT) departments of Samara general hospital.

The study population was examined clinically for the presence or absence of signs and symptoms of pharyngitis, throat swab culture and the isolation of group A and other groups of β-hemolytic streptococci was confirmed using serogrouping strep test. The result of this study show that the isolation rate of β-hemolytic streptococci was 47.66% and of group A was 23.66% among the study population. The isolation was higher in the following situations (4–8) year olds, among children lived in crowded conditions, among children with recurrent tonsillitis. The antimicrobial susceptibility testing revealed that the highest sensitivity rate of the group A streptococci was to Azithromycin (80.3%) followed by Penicillin G (77.5%) and Ceftriaxone (74.7%). Gentamycin was the least effective antimicrobial agent tested.

Keywords: Group A β-hemolysis Streptococci, tonsillitis, Bacitracin, antimicrobial susceptibility patterns

Introduction

The genus Streptococcus which belong to the family streptococcaceae comprises a large and heterogeneous group of organisms, has broad significance in medicine and industry. Various Streptococci are important ecologically as part of the normal microbial flora of animals and humans; some can also cause diseases that range from subacute to acute or even chronic [1]. Streptococci are Gram positive organism, spherical or ovoid, and no larger than 2 μm in diameter [2].

The type of hemolytic reaction displayed on blood agar has long been used to classify the Streptococci. β-hemolysis is associated with complete lysis of red cells surrounding the colony. Serological subdivision of the Streptococci exploits differences in the group- specific polysaccharide antigens in the cell wall. Lancefield thus identified different groups of β- hemolytic Streptococci and her scheme includes 20 serogroups designated sequentially with the letters A-H and K-V [3]. According to this classification, Streptococci will be considered as follows: (i) Pyogenic streptococi (Lancefield groups), (ii) Pnumococci, (iii) Viridans streptococci, and (iv) Other, principally non-hemolytic streptococci [4].

Penicillin remains the drug of choice for group A streptococci, it is safe, inexpensive, and of narrow spectrum and there is no direct or indirect evidence of loss of efficacy [5]. The reason for the lack of penicillin resistance is not known. However, some strains have developed penicillin tolerance by inhibiting the bactericidal effects of the antibiotic [6]. Erythromycin is often used when allergy to penicillin is suspected or when a decision is made to treat a carrier. This may happen when there are recurrence of tonsillitis despite penicillin treatment [7]. GABHS are also susceptible to other macrolides like clarithromycin and azithromycin and also susceptible to cephalosporins [8].

There are significant resistance of GABHS to certain antibiotics in defined geographic areas; this has been temporally related to increased or excessive use of specific antimicrobial agents, the best example of this,
the macrolides resistance [8]. During the last few years, erythromycin-resistant \textit{S. pyogenes} has been reported in different parts of the world. Two distinct mechanisms of erythromycin resistance are described among group A streptococci. One consists of target site modification by erymethylase strains that express the MLSb phenotype of resistance; the other consists of an active drug efflux that pumps 14-and 15-membered macrolides out of the cell [9].

This study is conducted in order to determine the rate of isolation and antibiotic susceptibility of group A \(\beta\)-haemolytic streptococci among children with acute pharyngitis.

Materials and Method

The study was carried out during six months (October 2017 to March 2018) in Samarra general hospital located in the center of Samaraa city, 120 Km north of Baghdad. Three hundred children with acute pharyngitis were examined, aged 3–12 year from different areas of Samaraa city. Throat swab was taken by disposable cotton swab. The throat swab was rolled on two types of Selective media, the first was crystal violet blood agar (HiMedia/india) which is selective for GABHS and other streptococci and inhibit the growth of \textit{staphylococci} and some other bacteria [10]. The second selective medium was blood agar supplemented with sulphamethaxazole (23.75 \(\mu\)g/ml) and trimethprim (1.25 \(\mu\)g/ml) [11] which suppresses the growth of normal flora and growth of groups of C, F and GBHS. After inoculation, the plates were incubated aerobically at 37\(^\circ\)C for 18-24 hours.

Lancefield grouping of BHS: The lancefield serological system for identification of BHS is based on the immunological differences in their cell wall polysaccharide. After enzyme extraction, these group specific polysaccharide antigen are demonstrated when the enzymically extracted antigen is mixed with latex particles coated with the corresponding antibody and agglutinate it [12].

Antimicrobial susceptibility test: In this study, the disc diffusion method was used to assess the sensitivity of GABHS isolates to a number of antibacterial agent according to [13].

Results and Discussion

\(B\) \textit{hemolytic streptococci} were isolated from 143 (47.66\%) throat cultures, and 157 (52.33\%) of throat culture show growth of one or more of other bacteria. Isolation rates BHS groups are shown in table (1). Seventy one (49.65\%) of isolated BHS were group A and Seventy two (50.35\%) were non\_group A, among these group C from the highest isolation rate 28 (19.58\%) followed by group G 26 (18.18\%). Group A\(\beta\)-hemolytic \textit{streptococcus} associated pharyngitis is an important infection in children because of its potential to complicate into rheumatic fever and rheumatic heart disease. Despite progress in streptococcal vaccine design, there is no specific prophylaxis of group A streptococcal infection now, which determines the high value of antiepidemic measures [14]. So the primary prevention of spread of streptococcal pharyngeal infection and developing their sequelae depends on identifying children with GABHS in their throats. The results of this study show that BHS were isolated from 143 (47.66\%) throat culture and 52.33\% of our samples were negative throat culture to BHS. Similar results were reported [15,16].

That illustrates the large proportion of pharyngitis that is caused by bacterial pathogens in this population of children. The proportion GABHS among the BHS was 49.65\% which represent 23.66\% from the total examined children. This result was in agreement with that reported by [17] in AL_Tameem (21.3\%) and [18]. The reasons for this difference in solution rates of GABHS among different population are due to the age, population size, season, socioeconomic statutes, geographic location, environmental factors, residence and personal hygiene.

Table 1: Isolation rates of BHS groups

<table>
<thead>
<tr>
<th>BHS Group</th>
<th>No.</th>
<th>% within group</th>
<th>% within Total population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>71</td>
<td>49.65</td>
<td>23.66</td>
</tr>
<tr>
<td>Non_group A</td>
<td>72</td>
<td>51.35</td>
<td>24.00</td>
</tr>
<tr>
<td>Group B</td>
<td>8</td>
<td>5.59</td>
<td>2.67</td>
</tr>
<tr>
<td>Group C</td>
<td>28</td>
<td>19.58</td>
<td>9.33</td>
</tr>
<tr>
<td>Group D</td>
<td>6</td>
<td>4.20</td>
<td>2.00</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Group</th>
<th>Bacitracin sensitive</th>
<th>Bacitracin resistant</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group F</td>
<td>4</td>
<td>2.8</td>
<td>1.33</td>
</tr>
<tr>
<td>Group G</td>
<td>26</td>
<td>18.18</td>
<td>8.67</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100</td>
<td>47.66</td>
</tr>
</tbody>
</table>

**Susceptibility to bacitracin:** Bacitracin susceptibility test was used as a presumptive method for differentiation of group A from other BHS. Table (2) show that the false positive result was 13.9%, i.e. Other group of BHS which were bacitracin sensitive, and false negative result was 7.40%, i.e. Serologically identified group A that were bacitracin resistant.

In our study, a presumptive differentiation of group A from other groups of BHS based on inhibition of the growth of group A by the use of bacitracin disc (0.04 unit). A false negative result of 7.04% and a false positive of 13.9% were detected when bacitracin sensitivity test compared with the Lancefield serogrouping test. The validity of bacitracin test in this study indicate sensitivity of 95% and specificity of 90%. Thus the bacitracin test was of value to differentiate between group A and other groups of BHS since it was with high sensitivity and specificity. Age has with high been reported to be an important factor in the microbiological, Etiology of pharyngitis[19].

**Table 2: Correlation of bacitracin susceptibility and serological grouping of BHS**

<table>
<thead>
<tr>
<th>Bacitracin susceptibility</th>
<th>Group A identified by serogrouping</th>
<th>Non-group A identified by serogrouping</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Bacitracin sensitive</td>
<td>66</td>
<td>92.96</td>
</tr>
<tr>
<td>Bacitracin resistant</td>
<td>5</td>
<td>7.04</td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
<td>100</td>
</tr>
</tbody>
</table>

Sensitivity = 95%; Specificity = 90%

**Age Distribution:** Table (3) show the isolation rate of BHS was highest in the 4-8 year age groups (67.2%) compared with 32.8% in other age group and same thing for GABHS (70.45%) in the 4-8 year age groups. In our study the age distribution of children according to throat culture results was 67.2% of BHS isolated from throat of children aged 4_8 year age groups compared with 32.8% in other age groups and 70.45% of GABHS was also isolated in children in same age group.

Type specific immunity that developed with age to the most serologic types of GABHS may explain why group A are isolated less frequently from human as they get older. In our study GABHS isolated more from children in age 4-8 years may be due to variation in number of children in different age group e.g. children in these age groups were more than other [20].

**Table 3: Age distribution of population with BHS**

<table>
<thead>
<tr>
<th>Age (year)</th>
<th>BHS</th>
<th>GABHS</th>
<th>Non_GABHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>7.0</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>12.6</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>11.2</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>13.3</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>25</td>
<td>17.5</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>12.6</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>12</td>
<td>8.3</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>6.3</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>7.0</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>6</td>
<td>4.2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100</td>
<td>71</td>
</tr>
</tbody>
</table>
Crowding Index: The association between isolation rate of GABHS and crowding index is shown in table (4). Group ABHS was predominant (91.7%) in children with crowding index of three and over.

Several epidemiologic studies in developing countries have demonstrated that crowding index, poverty and low education are interrelated of diseases. In this work GABHS was predominant (91.7%) in children living in crowded conditions. This result was in agreement with that reported by [21]. It was possible that traditional behavior of mothers, poor personal hygiene, in adequate caring practices and poor sanitation may favor development of streptococcal pharyngitis.

Table 4: Relation between isolation of GABHS and the crowding index. (n = 71)

<table>
<thead>
<tr>
<th>C.I. Crowding index</th>
<th>GABHS isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
</tr>
</tbody>
</table>

Child history of tonsillitis: Table (5), show the relation between isolation rate of GABHS and child history of tonsillitis. Group ABHS was predominant (71.8%) in children with history of tonsillitis of more than four times per year.

Table 5: Relation between isolation of GABHS and child history of tonsillitis

<table>
<thead>
<tr>
<th>No. of episodes</th>
<th>GABHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>1/month</td>
<td>14</td>
</tr>
<tr>
<td>1/2 month</td>
<td>21</td>
</tr>
<tr>
<td>1/season</td>
<td>16</td>
</tr>
<tr>
<td>1/year</td>
<td>10</td>
</tr>
<tr>
<td>Seldom</td>
<td>7</td>
</tr>
<tr>
<td>Tonsillectomy</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>71</td>
</tr>
</tbody>
</table>

Antimicrobial susceptibility test: Table (6) show the susceptibility patterns of GABHS to ten antimicrobial agents. GABHS isolates were highly susceptible to azithromycine (80.3%) followed by penicillin G and ceftriaxone 77.5% and 74.7% respectively. GABHS show highest resistant rates to gentamycin (63.4%) followed by lincomycin and ampicillin 46.5% and 42.3% respectively.

Table 6: Susceptibility of GABHS to ten antimicrobial agents

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Sensitive</th>
<th>Moderate</th>
<th>Resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin G</td>
<td>25 35.2</td>
<td>30 42.3</td>
<td>16 22.5</td>
</tr>
<tr>
<td>Augmentin</td>
<td>18 25.4</td>
<td>25 35.2</td>
<td>28 39.4</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>16 22.5</td>
<td>25 35.2</td>
<td>30 42.3</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>14 19.7</td>
<td>29 40.9</td>
<td>28 39.4</td>
</tr>
<tr>
<td>Amikacin</td>
<td>19 26.8</td>
<td>26 36.6</td>
<td>26 36.6</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>11 15.5</td>
<td>15 21.1</td>
<td>45 63.4</td>
</tr>
<tr>
<td>Lincomycin</td>
<td>20 28.1</td>
<td>18 25.4</td>
<td>33 46.5</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>20 28.1</td>
<td>32 45.1</td>
<td>19 26.8</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>24 33.8</td>
<td>29 40.9</td>
<td>18 25.4</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>27 38</td>
<td>30 42.3</td>
<td>14 19.7</td>
</tr>
</tbody>
</table>

The pattern of bacterial susceptibility to different antimicrobial agents varies considerably with different factors like geographical area, environmental conditions, and virulence of the organism [22]. Increased or excessive use of antimicrobial agents in treating all cases of throat infections although a high percent of these infections are viral rather than bacterial, this leads to significant appearance of antimicrobial resistance and treatment failure. For this reason susceptibility of GABHS were tested against ten antimicrobial in practice.
for the treatment guide lines have advocated for the use of penicillin as first line and the use of a macrolide in penicillin allergic individuals who are suspected to have GABHS pharyngitis. Although this believing that GABHS are uniformly highly sensitive to the action of penicillin, it is found in this study that 22.5% of the isolated group A were resistant to penicillin.

Our result was in disagreement with [23]. Who showed no penicillin resistance among BHS isolates. In our study a high resistant rates of GABHS were reported to gentamycin (63.4%) followed by lincomycin (46.5%) and ampicillin (42.3%).

Macrolides including erythromycin and lincomycin have been widely used for treatment of acute pharyngitis and invasive infection of GABHS. In our study the azithromycin resistance was 19.7% which is higher than (5.2%) that reported by [23].

Conclusion
The result of this study show that the isolation rate of GABHS, was age related crowding index and child history of tonsillitis. Group A form the highest isolation rate among other groups of B_haemolytic streptococci, group A strep isolates show highest rate to Gentamycin followed by Lincomycin and ampicillin.

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Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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REFERENCES


Relationship between BMI and Risk Factor of Breast Cancer

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ABSTRACT

Breast cancer is the commonest cancer affecting women worldwide. Different studies have dealt with the etiological factors of that cancer aiming to find a way for early diagnosis.

This investigation was carried out on 74 patients (all were females) who received satisfactory therapy. The present study investigated the relationship between BMI and evaluation of some etiological risk factors among breast cancer patients in Iraq.

They were confirmed for breast cancer by histopathological examinations at Nanakali Hospital in Erbil. All women were between 20-72 years. Ages, Weight, height, stage (II, III), hormone receptors ER, PR and Her2 were taken into account as risk factors.

Among the breast cancer patients, 45% were pre-menopausal and 28% were menopausal and 27% were post-menopausal. Body mass index (BMI) is widely used as a measure of obesity. We investigated the relationship between obesity (BMI ≥ 30 kg/m²) and outcomes in women with ER-positive early stage breast cancer.

Women with high BMI presented with more aggressive stage at the time of diagnosis. Their tumor usually show positive hormonal status (ER/PR), HR+/Her2- being the most Predominant molecular subtypes. most of obese women have tumor hormonal status positive with favorable molecular subtype (ER+/Her2-), thus Decreasing weight will mainly contribute to decrease tumor exposure to high endogenous estrogen especially in postmenopausal age dramatically effect response to treatment in return.

Keywords: BMI, Breast cancer, Risk factor

Introduction

Breast cancer is the commonest malignancy found in women in Europe and the United States, and the incidence continues to rise slowly (1). Breast cancer is the most common cancer among women in Arab countries with a younger age of around 50 years at presentation. Locally advanced disease is very common and total mastectomy is the most commonly performed surgery (2). In Iraq, breast cancer is the commonest type of female malignancy, accounting for approximately one-third of the registered female cancers according to the latest Iraqi Cancer Registry. This shows that the breast is the leading cancer site among the Iraqi population in general, surpassing even bronchogenic cancer (3).

Worldwide, at least 2.8 million people die each year as a result of being overweight or obese, and an estimated 35. 8 million (2.3%) of global Disability –Adjusted Life Years (DALYs) are caused by overweight or obesity. Overweight and obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Risks of coronary heart disease, ischemic stroke and type 2 diabetes mellitus increase steadily with increasing body mass index (BMI), a measure of weight relative to height. Raised body mass index also increases the risk of cancer of the breast, colon, prostate, endometrium, kidney and gall bladder (4).

It was shown from studies that obesity is associated with the incidence of breast cancer (5-7). Overweight patients with breast cancer often have higher mortality rate than patients with normal weight. Obesity is a factor leading to poor prognosis in breast cancer (8-10). At present, body mass index (BMI) is applied to measure whether a person is obese or not. Both the weight and the height of the body are considered in BMI, which reflect the relationship between body mass and height. BMI is
easy to measure, and it is currently the standard index used internationally to measure the extent of obesity and to evaluate the overall fitness.

Materials and Method

Patients: This study was a retrospective-prospective study, carried out at Nanakali hematology/oncology hospital of Erbil on a sample of 74 cases, who were diagnosed with breast cancer (stage II and stage III).

Collected data included full questionnaire regarding (age, weight, height, body mass index) and clinic-pathological assessment (such as TNM staging, histology grade, ER/PR and HER2 status).

Body Mass Index (BMI): BMI was calculated as weight in kilograms divided by height in meters squared and rounded to the nearest tenth, according to the following equation (11).

\[
\text{Body Mass Index (BMI) = } \frac{\text{Weight (kg)}}{\text{Height m}^2}
\]

Following current recommendations, normal weight was defined as a BMI of 18.5-24.9, overweight as BMI of 25.0 to 29.9, and obesity as a BMI of 30.0 or higher (12).

Data Analysis: The relationship of BMI to the stage of breast cancer at diagnosis was evaluated using the x² test for frequency tables of BMI by stage of breast cancer. The Pearson correlation test was used to determine any association between BMI and age.

Results and Discussions

A total of 74 breast cancer patients (age range = 20–72 years) were included in the present study (Table 1).

Table 1: Menopausal Distribution of Breast Cancer Patients

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premenopausal</td>
<td>33</td>
<td>45</td>
</tr>
<tr>
<td>Menopausal</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>100</td>
</tr>
</tbody>
</table>

We classified them into three age groups:

1. Premenopausal: women less than 45 years of age (45% of patients)
2. Menopausal women between 45 - 50 years of age (28% of the patients)
3. Postmenopausal those greater than 50 years of age (27% of the patients).

(81%) of our breast cancer patients had positive ER, (82%) of breast cancer patients had positive PR. About one third (38%) of our breast cancer patients had positive HER2 and 62% of them had negative HER2. These findings are shown in Table 2. This was similar to studies done in Iraq and Turkey (13, 14).

Table 2: Hormone Receptors, HER2 Receptors Status and TNM Staging of Breast Cancer Patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>60</td>
<td>81</td>
</tr>
<tr>
<td>Negative</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>100</td>
</tr>
<tr>
<td>PR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>61</td>
<td>.82</td>
</tr>
<tr>
<td>Negative</td>
<td>13</td>
<td>.18</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>.100</td>
</tr>
<tr>
<td>Her2/neu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>28</td>
<td>.38</td>
</tr>
<tr>
<td>Negative</td>
<td>46</td>
<td>.62</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>.100</td>
</tr>
<tr>
<td>TNM Staging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>49</td>
<td>66.2</td>
</tr>
<tr>
<td>III</td>
<td>25</td>
<td>33.8</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>100</td>
</tr>
</tbody>
</table>

As regards the staging of breast cancer, according to AJCC staging, stage II and III breast cancer were found in 66.2% and 33.8% of the patients (Table 2).

They were classified according to BMI into three groups Normal (9.4% of the patients), Overweight (36.4% of the patients) and Obese (54.2% of the patients). Mean BMI of the studied breast cancer patients was 32.9 Kg/m² (Table 3).

Table 3: BMI Distribution of Breast Cancer Patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI mean ± SD</td>
<td>(32.9 ± 3.8 Kg/m²)</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>7</td>
<td>9.4</td>
</tr>
<tr>
<td>Overweight</td>
<td>27</td>
<td>36.4</td>
</tr>
<tr>
<td>Obese</td>
<td>40</td>
<td>54.2</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>100</td>
</tr>
</tbody>
</table>
There was a significant association between obesity and breast cancer patients with positive ER (p≤0.05) by using chi square test. A significant association was observed between obesity among breast cancer patients and positive PR (p<0.05). Data are shown in Table 4.

**Table 4: Distribution of Hormone Receptors, HER2 Receptor, and Stage According to BMI Categories**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>P-value</td>
</tr>
<tr>
<td>ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>3</td>
<td>43</td>
<td>24</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>4</td>
<td>57</td>
<td>3</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>PR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5</td>
<td>71</td>
<td>23</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>2</td>
<td>29</td>
<td>4</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Her2/neu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>3</td>
<td>43</td>
<td>10</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>4</td>
<td>57</td>
<td>17</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Nottingham Grading System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>4</td>
<td>57</td>
<td>20</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>43</td>
<td>7</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

There was a significant association between breast cancer patients with positive ER and obesity (p≤0.05), as showed in Table 4 and a significant association was also observed between Breast cancer women with positive PR and obesity. These findings are consistent with results of Peng Xing, et al study (15).

There was significant association between BMI categories and breast cancer patients regarding stage of tumor (Nottingham Grading System) (p <0.05). Data are shown in Table 4. Breast cancer patients in our study with TNM stage II and III were associated significantly with obesity (p≤0.05), see Table4. This finding agreed with results of study done by Eichholzer M. et al study and Cui y. et al study which suggested that higher body mass index was associated with advanced stages of breast cancer (16, 17). There may be several reasons for the observed association between body mass and stage of breast cancer at diagnosis. First, this association could be due to a delay in diagnosis among obese women. Overweight/obese women have larger breasts, and thus tumor detection may be more difficult in these women simply because tumors are more difficult to palpate in larger breasts. This hypothesis is supported by several studies that show a positive relationship between breast size and stage of breast cancer. (18) Second, obesity is associated with advanced breast cancer at diagnosis, high tumor proliferation rates, and more triple-negative phenotypes, indicating that it may adversely contribute to prognosis. (19) Some studies suggest that locally increased estrogen levels promote tumor growth. (20) Obesity causes an increased production of the estrogen known as estrone via the aromatization of androstenedione in peripheral adipose tissue. In addition, obesity is associated with low levels of sex hormone-binding globulins, which results in a significantly higher level of the biologically active, unbound form of estrogen known as estradiol. (15) Therefore, it is possible that obesity leads to an overall increase in the active levels of estrone and estradiol and that the high levels of these hormones promote the growth of breast tumors in obese women.

There is significant association between obesity and hormonal receptor subtype ER+/PR+ (P≤0.001), as shown in Table 5.
Table 5: ER/PR Receptor Distribution According to BMI in Breast Cancer Patients

<table>
<thead>
<tr>
<th>BMI ER &amp; PR</th>
<th>ER &amp; PR +ve</th>
<th>ER+ve/PR-ve</th>
<th>ER-ve/PR+v</th>
<th>ER &amp; PR. -ve</th>
<th>X²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>3</td>
<td>0.5</td>
<td>7</td>
<td>46.6</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Overweight</td>
<td>23</td>
<td>42.0</td>
<td>3</td>
<td>20.0</td>
<td>27</td>
<td>39.1</td>
</tr>
<tr>
<td>Obese</td>
<td>29</td>
<td>57.5</td>
<td>5</td>
<td>33.4</td>
<td>40</td>
<td>57.9</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td>100</td>
<td>15</td>
<td>100</td>
<td>69</td>
<td>100</td>
</tr>
</tbody>
</table>

There is strong association between high BMI and ER+/PR + hormone receptor subtype in our study (p ≤0.001), as shown in Table 5. These results are somewhat similar to results of 9 cohort and 22 case-control studies comparing the highest versus the reference categories of relative body weight showed that the risk for ER+PR+ tumors was 20% lower (95% CI = −30% to −8%) among premenopausal (2, 643 cases) and 82% higher (95% CI = 55–114%) among postmenopausal (5, 469 cases) women (21). Current study found a significant association between obese postmenopausal breast cancer patients and HR+/Her- subtype (p<0.001) and this finding was more significant in postmenopausal obese women (p=0.001) as data show in Table 6. This finding agrees with results of study carried in Iraq (22).

Table 6: Distribution of BMI According Molecular Subtypes for Menopausal and Postmenopausal Breast Cancer Patients

<table>
<thead>
<tr>
<th>Molecular Subtypes</th>
<th>Premenopausal BMI</th>
<th>Menopausal BMI</th>
<th>Postmenopausal BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Overweight</td>
<td>Obese</td>
</tr>
<tr>
<td>HR+/Her2-</td>
<td>3</td>
<td>100</td>
<td>7</td>
</tr>
<tr>
<td>HR+/Her2+</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>HR-/Her2+</td>
<td>2</td>
<td>5</td>
<td>15.5</td>
</tr>
<tr>
<td>HR-/Her2-</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Statistical test</td>
<td>χ²=6. 123</td>
<td>χ²=3. 651</td>
<td>χ²=3. 715</td>
</tr>
<tr>
<td>P Value</td>
<td>0.295</td>
<td>0.06</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Obesity has been recognized as a significant risk factor of breast cancer among postmenopausal women and is associated with poor prognosis. This result was in agreement with the results of another study that showed patients with high BMI are most clearly associated with hormone receptor–positive tumors and suggest that triple-negative tumors may have distinct etiology (23, 24).

This result disagrees with Lesley A. Stead study that triple negative tumors were equally common in black wo men diagnosed before and after age 50 (31% vs 29%), and who were obese and non-obese (29% vs 31%). Considering all patients, as BMI increased, the proportion of triple negative tumors decreased (p=0.08) (25). Body mass index (BMI) is widely used as a measure of obesity. Dignam et al. investigated the relationship between obesity (BMI ≥30.0 kg/m²) and outcomes in women with lymph node-negative, ER-positive early stage breast cancer. They found that obese women as compared with normal weight women had greater all-cause mortality (26). Obesity also has an adverse prognostic effect in women with lymph node-negative and ER-
negative breast cancer. However, this prognostic effect has not been consistent and may be influenced by several factors such as menopausal status, extent of disease, and receptor status (27, 28)

Conclusions

1. Most of Iraqi women with breast cancer were either obese or overweight at the time of diagnosis.
2. Women with high BMI presented with more aggressive stage at the time of diagnosis. Their tumor usually show positive hormonal status (ER/PR), HR+/Her2- being the most predominant molecular subtypes.
3. Increase awareness for not only breast cancer patients but also their physician about the importance of weight control during management of breast cancer patient and also breast cancer survivors.
4. Hence most of obese women have tumor hormonal status positive with favorable molecular subtype (ER+/Her2-), thus decreasing weight will mainly contribute to decrease tumor exposure to high endogenous estrogen especially in postmenopausal age, dramatically effect response to treatment in return.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Approaches of Removal Missed intrauterine Contraceptive Device (IUD)

Khalidah Mohammed Amin

Department of Gynecology & Obstetric, College of Medicine, Kirkuk University, Iraq

ABSTRACT

Background: Globally, more than one hundred million women choose intrauterine contraceptive device (IUD) for family planning. The complications related to IUDs are minor with low incidence and included pain, pelvic inflammatory disease, bleeding, ectopic pregnancy and missing or malposition of IUD. The missing IUD may be caused by displacement, perforation, embedding or expulsion of IUDs in uterine cavity or in peritoneal cavity. Current study was aimed to evaluate the pattern of diagnosis and management of missed or migrated intrauterine contraceptive device (IUD) by minimal access surgery, laparoscopy & hysteroscopy.

Method: The study was a prospective study in (54) patients referred to gynecological department in Azadi Teaching Hospital in Kirkuk between September 2009 and April 2018. The site of missed (IUD) was diagnosed by ultrasonography and x ray.

Results: Intrauterine contraceptive devices were removed after dilatation of cervix and exploration of uterine cavity in (28) patients, (7) cases by hysteroscopy, (15) cases by laparoscopic removal, in (3) cases by laparotomy and in one case IUD was taken out through cystoscopy.

Conclusion: It is recommended that approach for removal of missed IUDs should be planned according to the site. Laparoscopy is superior to laparotomy in perforated outside the uterus. Intrauterine device should be inserted by trained medical professionals.

Keywords: IUD, Laparoscopy, Hysteroscopy, Laparotomy, ultrasonography.

Introduction

Globally, more than one hundred million women choose intrauterine contraceptive device (IUD) for family planning [1]. The IUDs are regarded as common and effective contraceptive method [2]. The complications related to IUDs are minor with low incidence and included pain, pelvic inflammatory disease, bleeding, ectopic pregnancy and missing or malposition of IUD. The missing IUD may be caused by displacement, perforation, embedding or expulsion of IUDs in uterine cavity or in peritoneal cavity [3]. These missing complications had an incidence rate of less than 1%, but they are serious and accompanied by high risk of uterine perforation [4]. Prevalent risk factors accompanying the missing IUDs are inexperience of physicians, type or size of IUDs, lactating women and anomalies of uterus or cervix [5]. The removal of IUDs is commonly easy and safe procedure accomplished by detecting the IUD strings with grasping and pulling [6]. In Iraq, many complications were reported in relation to the intrauterine contraceptive devices like bleeding and migration or missing device [7, 8].

Diagnosis of missing IUD is dependable on regular evaluation of women after insertion of IUD every 6 months by history, physical examination, plain x-ray and trans-vaginal ultrasound examination. Two- or three-dimensional ultrasonography are routinely used for assessment of IUDs complication. However, in some cases with visceral perforation, computerized tomography is used [9]. Most of women with missing IUD were diagnosed in first 3 months after insertion of IUDs [10, 11].

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Laparoscopy and laparotomy were also used for management of missing IUDs and associated with high effectiveness rates and less complications [12, 13]. These removal procedures could be implemented with or without anesthesia according to severity of complications as in some cases using only paracervical block, while in uterine perforation cases, general anesthesia is mandatory. For pregnant women, the IUD either left inside or removed if associated with high risk on pregnancy [11-13].

Unfortunately, Iraqi women had low knowledge and interest in family planning in addition to primitive weak national family planning program which is dependable on newly graduated low experienced physicians [14,15]. For that, this study was aimed to evaluate the pattern of diagnosis and management of missed or migrated intrauterine contraceptive device, by minimal access surgery, laparoscopy & hysteroscopy in a sample of Iraqi women.

Patients and Method

The design of current study was prospective clinical follow up study that was carried out in Gynecological Department of Azadi Teaching Hospital in Kirkuk governorate in Iraq through duration from 1st of September 2009 to 30th of April 2018. Study population was all women referred to Gynecology Department with missing intrauterine contraceptive device. Reproductive age group women with missing IUD were the inclusion criteria. The exclusion criteria were women with normal or ectopic pregnancy with IUD, and those women that refused to participate. A sample of 54 women with missing IUD was included in the study. The ethical considerations were in accordance with Helsinki Declaration and oral or written consent was taken from each woman before enrolling in the study. Approval of study was obtained from hospital authorities and the researcher was responsible for monitoring and managing the women with missed IUD.

The suspected women with IUD were referred from primary health care centers or from private clinics. After their admission, assessment of women was done by the researcher through taking history, clinical and gynecological examinations. The women were referred to x-ray unit in the hospital for Trans-vaginal or abdominal ultrasonography and some of them to abdominal, pelvic and hysterosalpingogram with uterine sound x-rays. The ultrasonography and x-ray were done for women with missing IUD by Radiologist in Azadi Teaching hospital or in private clinic (Figures 1 and 2). The diagnosis was confirmed by the researcher. Other principal pre-operative investigations, like blood film, blood sugar, HIV and hepatitis viral screen, were done in the laboratory of the hospital.

Planning for management and approaches implemented were done by the researcher depending on status of the women and availability of treatment facilities. Conventional approach was done by dilation of the cevix and exploration of uterine cavity searching for IUD strings and this approach was done for missing IUDs that appeared by ultrasonography, close and easily grasped. The conventional approach was done under local or general anesthesia. Regarding laparoscopic approach, it was done by the researcher in laparoscopy room in Azadi hospital for pregnant women and those unfit for general anesthesia or cannot tolerate pain. Laparoscopy equipment was not always available during study period. Laparatomy was done for women with perforated uterus or migrated IUD to adjacent viscera. This surgical operation was implemented in Surgical Theater of Azadi Teaching Hospital by the researcher.
under general anesthesia. Hysteroscopy and cystoscopy were done for special cases of women who failed in removing missing IUD by conventional approaches and cystoscopy was done for one case diagnosed as vesicle stone and missed IUD. All the women with missing IUD were followed up for 1 month after removal of IUDs by three visits to hospital and checking by researcher in addition to phone calling to assess the post-procedure complications of each procedure like pain, fever, bleeding, suturing infection, etc. The anesthetic complications were assessed intra- and post-operatively by the researcher which might be nausea and vomiting, anaphylaxis, respiratory depressions, etc. Duration of each procedure and hospital stay of women were also recorded by the researcher.

The data collected were analyzed statistically by SPSS software version 22. Chi-squared test and Fischer’s exact test were applied for analyzing data as suitable. Level of significance (p value) was regarded statistically significant if it was ≤0.05.

**Results**

This study included 54 women with missing IUD. Mean age of studied women was 32.4 years; 13% of them were less than 20 years age, 31.5% of them were in age group 20-29 years, 51.8% of them were in age group 30-39 years and 3.7% of them were ≥40 years. Mean parity of women with missing IUD was 3 children; 14.8% of them had 1-3 children, 66.7% of them had 4-6 children and 18.5% of them had more than 6 children (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean = 32.4 years)</td>
<td></td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>7 (13.0)</td>
</tr>
<tr>
<td>20-29 years</td>
<td>17 (31.5)</td>
</tr>
<tr>
<td>30-39 years</td>
<td>28 (51.8)</td>
</tr>
<tr>
<td>≥40 years</td>
<td>2 (3.7)</td>
</tr>
<tr>
<td>Total</td>
<td>54 (100.0)</td>
</tr>
<tr>
<td>Parity (mean = 3 children)</td>
<td></td>
</tr>
<tr>
<td>1-3 children</td>
<td>8 (14.8)</td>
</tr>
<tr>
<td>4-6 children</td>
<td>36 (66.7)</td>
</tr>
<tr>
<td>&gt;6 children</td>
<td>10 (18.5)</td>
</tr>
<tr>
<td>Total</td>
<td>54 (100.0)</td>
</tr>
</tbody>
</table>

Regarding IUDs characteristics of studied women; mean duration of implementing IUD was 3.6 months, as 48.1% of women with IUD duration of 6 months and less, 35.2% with IUD duration of 7-12 months and 16.7% of women with IUD duration of more than 12 months. Types of IUDs used by women were distributed as follows; Cooper (87.1%) and Mirena (12.9%) (Table 2).

<table>
<thead>
<tr>
<th>Variable</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (mean = 3.6 months)</td>
<td></td>
</tr>
<tr>
<td>≤6 months</td>
<td>26 (48.1)</td>
</tr>
<tr>
<td>7-12 months</td>
<td>19 (35.2)</td>
</tr>
<tr>
<td>&gt;12 months</td>
<td>9 (16.7)</td>
</tr>
<tr>
<td>Total</td>
<td>54 (100.0)</td>
</tr>
<tr>
<td>Types of IUDs</td>
<td></td>
</tr>
<tr>
<td>Cooper</td>
<td>47 (87.8)</td>
</tr>
<tr>
<td>Mirena</td>
<td>7 (12.9)</td>
</tr>
<tr>
<td>Total</td>
<td>54 (100.0)</td>
</tr>
</tbody>
</table>

The management approaches for women with missing IUD were mainly conventional (dilation of cervix and exploration of uterus) for about half of women (51.9%), laparoscopic (27.8%), hysteroscopy (12.9%), laparotomy (5.6%) and cystoscopy (1.9%) (Table 3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>28 (51.9)</td>
</tr>
<tr>
<td>Hysteroscopy</td>
<td>7 (12.9)</td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>15 (27.8)</td>
</tr>
<tr>
<td>Laparotomy</td>
<td>3 (5.6)</td>
</tr>
<tr>
<td>Cystoscopy</td>
<td>1 (1.9)</td>
</tr>
<tr>
<td>Total</td>
<td>54 (100.0)</td>
</tr>
</tbody>
</table>

There was significant association between conventional approach for removing missing IUD and higher rate of post-procedure complications (p=0.02); women with laparoscopic removal of IUDs had no complications. No significant differences were observed between different approaches of IUDs removal regarding anesthesia complications (p=0.6). A significant association was observed between shorter procedure duration and laparoscopic removal of missing IUDs.
IUDs (p=0.006). Longer hospital stay was significantly prevalent for women with laparotomy while shorter hospital stay was significantly observed for women with laparoscopic removal of IUDs (p=0.002) (Table 4).

Table 4: Distribution of complications according to different approaches (n = 54)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No (%)</td>
<td>No (%)</td>
<td>No (%)</td>
<td>No (%)</td>
<td>No (%)</td>
<td>No (%)</td>
<td></td>
</tr>
<tr>
<td>Post procedure complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>12 (42.8)</td>
<td>2 (28.6)</td>
<td>0 (0)</td>
<td>1 (33.3)</td>
<td>1 (100.0)</td>
<td>0.02*</td>
</tr>
<tr>
<td>Negative</td>
<td>16 (57.2)</td>
<td>5 (71.4)</td>
<td>15 (100.0)</td>
<td>2 (66.7)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Anesthesia complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>4 (14.3)</td>
<td>0 (0)</td>
<td>3 (20.0)</td>
<td>1 (33.3)</td>
<td>0 (0)</td>
<td>0.6**</td>
</tr>
<tr>
<td>Negative</td>
<td>24 (85.7)</td>
<td>7 (100.0)</td>
<td>12 (80.0)</td>
<td>2 (66.7)</td>
<td>1 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 hour</td>
<td>10 (35.7)</td>
<td>3 (42.8)</td>
<td>13 (86.7)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.006*</td>
</tr>
<tr>
<td>≥1 hour</td>
<td>18 (64.3)</td>
<td>4 (57.2)</td>
<td>2 (13.3)</td>
<td>3 (100.0)</td>
<td>1 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Hospital stay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 day presentation</td>
<td>22 (78.5)</td>
<td>5 (71.4)</td>
<td>15 (100.0)</td>
<td>0 (0)</td>
<td>1 (100.0)</td>
<td>0.002*</td>
</tr>
<tr>
<td>≥1 day</td>
<td>6 (21.5)</td>
<td>2 (28.6)</td>
<td>0 (0)</td>
<td>3 (100.0)</td>
<td>0 (0)</td>
<td></td>
</tr>
</tbody>
</table>


Discussion

The intrauterine contraceptive device is public family planning method used worldwide [16]. Despite its importance and safety, it has a low rate of complications such as bleeding, pain, displacement, infection and pregnancy [13]. Present study revealed that during 9 years period, 54 women were collected with missing IUD. In Nigeria, 10 years follow up study by [17] found that among 44,975 women with IUD, 168 women of them had missing IUD. These data confirming facts that complications of IUD are characterized by low rate (less than 1%) [18]. Mean age of women with missing IUD was 32.4 years. This finding was similar to results of [2] in Iran who found that age of woman with missing IUD was within age group 30-39 years. The mean parity of women with missing IUD was 3 children. Similarly, [19] reported para 3 for woman with missing IUD. Pregnancy was observed in 11.1% of women with missing IUD. A recent Turkish study reported that retaining IUD in uterine cavity of a pregnant woman results in high risk of premature rupture of membranes [20].

Current study showed that mean duration of missing IUD was 3.6 months. This finding was consistent with results of previous studies [21,22] who reported that high proportions of women with missed IUD were within first six months after insertion and mostly in mean of 3 months. In our study, Cooper IUDs represented prevalent type for missing IUDs. Similar findings were reported by [23] who found high prevalence of Cooper IUD type for missing IUD among studied women, however, this higher prevalence was attributed to long life of Cooper IUD type that may reach 10 years which was experienced to have high rate of missing.

In present study, 51.9% of women with missing IUD were managed with conventional approach, while 27.8% of them were managed by laparoscopy. This finding was similar to results of [24] who documented that most of women with missing IUD were managed by dilation of cervix and exploration of uterine cavity. This conventional method is common in hospitals of developing countries as the facilities for other approaches are limited [25]. The post-procedure complications were significantly higher for women with missing IUD managed by conventional approach. This finding coincides with results of [1] who reported high complications rate for conventional approach of removing missing IUD in comparison to other approaches. Our study showed that laparoscopic removal of missing IUD was associated significantly
with shorter procedure and hospital stay durations. These findings were in agreement with results of [26] who found that laparoscopic removal of missing IUD is accompanied with high success rate and safety in addition to shorter hospital stay.

**Conclusion**

The laparoscopic removal of missing intrauterine contraceptive device is a safe approach. It is recommended that removal approach should be planned according to the site, as laparoscopy is superior to laparotomy in perforated outside the uterus. Also, intrauterine device should be inserted by trained medical professionals.

**Acknowledgment**

Special thanks for all workers in Gynecology Department at Azadi Teaching Hospital in Kirkuk for their support.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


The Study of Photothermal Effects of Radiation Laser on Human Skin Tissue

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1Department of Physics, Faculty of Education for Girls, 2College of Medicine, University of Kufa, Najaf, Iraq

ABSTRACT

Background: The physical principle of laser is the mutual effect between light and material. The energy produced by this effect can be precisely guided. This makes its use in biological materials results in tissue changes that can have therapeutic advantages. However, it should be noted that inappropriate use of radiation intensity invalidates and destroys the skills of surgeons. The aim of current study to study thermal and optical properties of human skin layers.

Results: Thermal penetration depth (of human skin layers (Epidermis, Dermis and Fatty tissue) increased with increasing the time(t seconds). Also, optical penetration depth (L/mm) of human skin layers (Epidermis, Dermis and Fatty tissue) was increasing with decreasing absorption coefficient(α/m). Moreover, increasing heating relaxation time () with decreasing the absorption coefficient (α/m).

Conclusion: As it was observed that the thermal penetration depth value of human skin layers was increased with increasing the time. Therefore; increasing optical penetration depth values with decreasing absorption coefficient of the human skin layers (Epidermis, Dermis and Fatty tissue). Also, increasing the heating relaxation time with decreasing absorption coefficient of human skin layers.

Keywords: Optical Penetration depth, time, Ztherm, heating relaxation time, absorption coefficient.

Introduction

The physical principle of laser is the mutual effect between light and material. The energy produced by this effect can be precisely guided. This makes its use in biological materials results in tissue changes that can have therapeutic advantages. However, it should be noted that inappropriate use of radiation intensity invalidates and destroys the skills of surgeons. The optics properties of skin depend on the shape, thickness and amount of melanin in skin tissues. The surgeon must know the characteristics of the tissue he is dealing with. It is necessary to know the type of laser (whether it is pulse or continuous), the intensity of the pumping and the wavelength of the laser[1,2].

In addition, it is necessary to know laser reaction with tissues as the biologic effects of different radiations differ in the different tissues. These effects can depend on the reflection of.

Thus, there is a specific use for each type of laser and depends on the therapeutic effects of laser on the spread of heat produced by radiation of the tissue. If it is carried out or reflected, there is no effect in it. In the case of dispersion of radiation, it means absorption of a larger area of the tissue and the spread of its effects and weakness. The degree of energy absorption by the tissue is determined by the wavelength of the laser and the length of exposure of tissue to the radiation.

Other factors include the size and speed of blood flow in the blood vessels as well as the intensity of the cutting area when the laser is used to cut the tissue[3-6].

The type of laser absorbed by the tissue may cause symptoms like clicking, cut the bleeding, fumigation and cracking of tissues[7].
Distribution and quantity of highly absorbing chromophores, for example haemoglobin and melanin, also scattering structures, for example filamentons proteins may affect light transport inside the skin \[8\]. Through the equation, which is called spectrum intensity-weighted average, we can calculate the effective optical absorption coefficient of human skin tissues (hair, epidermis and dermis)\[9\].

\[
\mu_x = \mu_y \cdot v_{f_y} \cdot S_{f_y} + \mu_{water} \cdot v_{f_{water,x}} \cdot S_{f_{water,x}} \quad \ldots(1)
\]

\(\mu\) = optical absorption coefficient, \(v_f\) = volume fraction of chromophore (collagen and blood) to the melanin and dermis for hair and epidermis, \(S_f\) = the spectrum percentage absorbed via chromophore and water, \(x\) = hair, dermis and epidermis, \(y\) = chromophore and water, \(X\) = the water inside tissue \(x\).

**Theory of Study**: This study depends on the laser interaction with human skin, The cell contains water and other chemical components, Two types of interactions are there; thermal and chemical.

The thermal effects on the tissue can result in:
1. Changes in cell membrane,
2. Changes in the nature of cells.
3. Composition of molecules.
4. Cut in the continuity of the tissue.

These effects lead to changes in viscosity, density and water content. Photothermal effects are affected by vaporization of water in the human skin layer. Moreover, the thermal properties are different in dermis, fatty tissue and epidermis \[3,10-12\] as shown in Figure (1).

**Beer’s Law showed\[13\]**:

\[
I_Z = I_0 \exp(-\mu_a Z) \quad \ldots(2)
\]

\(Z\): thickness

\(I_Z\): Absorbed intensity measured in W/cm\(^2\)

\(I_0\): Incident intensity measured in W/cm\(^2\)

\(\mu_a\): absorption coefficient measured in cm\(^{-1}\)

In addition, Wien’s displacement law showed\[5\]:

\[
\lambda_{max} = \frac{2898}{T} \quad \ldots(3)
\]

\(\lambda_{max}\) = the maximum wave length, \(T\) = temperature

where \[14\]:

\[
\lambda_{max} \propto \frac{1}{T} \quad \ldots(4)
\]

**Results and Discussion**

**The relation between absorption Coefficient and Optical Penetration depth in human skin layer**

Optical Penetration depth of the layer of the human skin was measured according to the following equations\[13\]:

\[
L = \frac{1}{\mu_a} \quad \ldots(5)
\]

\(L\) = Optical penetration depth

\(\mu_a\) = Absorption Coefficient

Absorption Coefficient of the layer can be found by using Laser Diode at wave length 1552nm which was showed in the Table (1)\[10\].

**Table 1: The relative amid thickness and absorption Coefficient**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness (mm)</th>
<th>Absorption coefficient (\mu_a) (mm(^{-1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermis</td>
<td>0.05</td>
<td>1</td>
</tr>
<tr>
<td>Dermis</td>
<td>1</td>
<td>0.80</td>
</tr>
<tr>
<td>Fatty tissue</td>
<td>1.5</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Whereas increasing optical penetration depth will decrease the absorption Coefficient and results are listed in Table (2), while Figure (2) showed the relative amid absorption Coefficient and optical penetration depth.
Table 2: The optical penetration depth

<table>
<thead>
<tr>
<th>Layer</th>
<th>Optical penetration depth (L) (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermis</td>
<td>1</td>
</tr>
<tr>
<td>Dermis</td>
<td>0.80</td>
</tr>
<tr>
<td>Fatty tissue</td>
<td>0.50</td>
</tr>
</tbody>
</table>

The relative amid heating penetration depth and periodic time in human skin layer: Heating penetration depth of the layer of the human skin was measured according to the following equations $^{15}$:

$$Z_{\text{therm}} = \sqrt{\frac{4Kt}{\mu a}}$$

$Z_{\text{therm}}$: thermal penetration depth

$K$: Temperature conductivity which is equal to $1.4 \times 10^{-7} \text{m}^2/\text{sec}$

The time measured in second. Increasing thermal penetration depth will increase the time (Table 3).

Table 3: The relation between time and thermal penetration depth

<table>
<thead>
<tr>
<th>Time (second)</th>
<th>Thermal penetration depth (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.007</td>
<td>0.00000000006</td>
</tr>
<tr>
<td>0.014</td>
<td>0.0000000009</td>
</tr>
<tr>
<td>0.028</td>
<td>0.000000125</td>
</tr>
<tr>
<td>0.056</td>
<td>0.0000000018</td>
</tr>
<tr>
<td>0.07</td>
<td>0.000019</td>
</tr>
<tr>
<td>0.1</td>
<td>0.00023</td>
</tr>
</tbody>
</table>

The relative amid heating relaxation time and absorption coefficient: Heating relaxation time of the layer of the human skin was measured according to the following equations $^{15}$:

$$\tau_{\text{therm}} = \frac{1}{\mu a 5.6 \times 10^{-7}}$$

$\tau_{\text{therm}}$: heating Relaxation time

$\mu a$: Absorption coefficient

Absorption coefficient of the layer can be found by using Laser Diode at wave length 1552nm (Table 1)$^{10}$.

Where increasing heating relaxation time will decrease the absorption coefficient (Table 4). Figure (3) showed the relation between absorption coefficient and heating relaxation time.

Table 4: The relation between absorption coefficient and heating relaxation time

<table>
<thead>
<tr>
<th>Layer</th>
<th>Heating Relaxation time (second)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermis</td>
<td>$1.79 \times 10^{-10}$</td>
</tr>
<tr>
<td>Dermis</td>
<td>2,232,142.857</td>
</tr>
<tr>
<td>Fatty tissue</td>
<td>3,571,428.571</td>
</tr>
</tbody>
</table>

Figure 3: The relation between absorption coefficient and heating relaxation time

Conclusion

This study of the Photothermal properties of human skin layers showed the influence of radiation of laser on human skin layers. As it was observed that the thermal penetration depth value of human skin layers was increased with increasing the time. Therefore; increasing optical penetration depth values with decreasing absorption coefficient of the human skin layers (Epidermis, Dermis and Fatty tissue). Also, increasing the heating relaxation time with decreasing absorption coefficient of human skin layers.

Acknowledgement

We would like to thank Department of Physics, Faculty of Education for Girls and College of medicine in the University of Kufa.
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**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


Double Lumen Subclavian Catheter Complications among Patients with End Stage Renal Disease on Continuous Hemodialysis

Mohammed Hakim Shamran Al-Hchaim¹, Bashar R. Mohammed Ali¹, Abeer Miri Abdullah¹

¹Adults Nursing, Faculty of Nursing, University of Kufa, Iraq

ABSTRACT

This study aims to assess the double lumen subclavian catheter complications among patients with end stage renal disease and to find out the relationship between the patient double lumen subclavian catheter complications and their demographic characteristics.

A descriptive study was carried out through the present study in order to achieve the early stated objectives. The study was begun from February, 1st, 2017 to April, 10th, 2017. The study is conducted in Al-Najaf City in Iraq in dialysis centers of Al-Sadder Medical City and Al-Hakeem General Hospital. A non-probability (Convenience) sample of (29) patients with ESRD who are admitted to the dialysis centers. The data was collected on structured questionnaire designed specifically for this study, and it is consist of two parts: Part 1 Included Socio-demographic characteristics, and Part 2 Include (13) items concerned with the complications of double lumen subclavian catheter.

Double lumen subclavian catheter for hemodialysis is preferred by many because catheters can be left in longer than femoral or jugular catheters in mobile patients, but the subclavian vein catheterization is associated with a variety of complications.

The researcher can conclude that the infection of the catheter’s orifice is high percentage among double lumen subclavian catheters complications and the result shows that there is no significant relationship between socio-demographic data and complications.

The study recommends that the catheter should be performed only by trained personnel and should enhance the methods of sterile techniques in hemodialysis unit to decrease infection by improving the nursing practice through training course.

Keywords: Double Lumen, Subclavian, Catheter, End Stage Renal Disease, Hemodialysis.

Introduction

Renal failure (RF) is global health problem, which strikes millions of people worldwide, and causing either a lifetime severe disability or death. About (110,000) patients in the United States started treatment for RF in 2007 (1). A hemodialysis machine has a special filter called a dialyzer, or artificial kidney, to clean your blood. To get blood into the dialyzer, the doctor needs to make an access, or entrance, into blood vessels. This is done with minor surgery, usually to the arm. Three different types of access can be made—a fistula, a graft or a catheter (2).

The third type of access, called a catheter, is inserted into a large vein in the neck or chest. This type of access is generally used when you need dialysis for a short period of time. Catheters may be used as a permanent access but only when a fistula or a graft cannot be placed. The patient will be referred to a special surgeon for placement of the access (3-7).

The major risks are the complication associated with insertion (8). With expert techniques these complications

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are extremely uncommon. Chronic complications include catheter related sepsis, thrombosis of the catheter which will cause neck swelling and venous hypertension in the extremity \(^9\). Venous access under ultrasonographic and fluoroscopic guidance has the added advantage of significantly reducing the rate of immediate complications \(^5\). Inadvertent arterial puncture, ateriovenous fistula, thoracic duct injury, brachial plexus injury, laceration of the subclavian vein, and air embolism are the well described complication of the central line insertion \(^6\).

Materials and Method

**Design of the Study:** A descriptive study was carried out through the present study in order to achieve the early stated objectives. The study was began from February, 1st, 2017 to April, 10th, 2017 in Al-Najaf City in Iraq in dialysis centers of Al-Sadder Medical City and Al-Hakeem General Hospital.

**The Sample of the Study:** A non-probability (Convenience) sample of (29) patients with ESRD who are admitted to the dialysis centers.

**The Study Instrument:** A questionnaire was constructed by the researcher to assess the double lumen subcalvian catheter complication among patients with end stage renal disease. The questionnaires was constructed and composed of two parts Part 1: Scio-Demographic characteristics consisted of (8) items, including (age, gender, residency, socio-economic status, educational level, marital status, duration of disease and duration of dialysis). Part II. Complications of double lumen subclavian catheter consisted of (13) items.

**Data Collection:** The data was collected individually by interview technique in the hemodialysis center. They were interviewed in a similar way, in the same place, for all the sample who were included in the study.

**Data Analyses:** The data of the study were analyzed through the use of statistical package of social sciences (SPSS) version 19 through descriptive and inferential statistical analyses. The statistical data was analyzed by using descriptive statistics and inferential statistics.

**Results**

The majority of the study sample is within the first category of age groups and accounted for (31.0%). also shows the majority of the study sample (55.2%) are males and the remaining are females (44.8%). Relative to subject, residency, the results indicate that the majority of study sample (58.6%) were from rural area. In addition, the study results indicate that (62.1%) of patients were exhibit satisfied to some extent in related to socio-economic status. Also the study results indicate that the high percentage (34.5%) of study sample are illiterate in related to the level of education. Regarding to the subjects marital status, the majority of them are married and they accounted for (62.1%) of the whole sample.

Furthermore, with hemodialysis period, the study result shows that the majority of the study subjects (79.31%) were under hemodialysis for (one) year. Finally, with duration of renal failure, the study result shows that the majority of the study subjects (51.72%) were under renal failure for (one) year.

The frequencies of complication in patient with double lumen subclavian catheter: about 13 (44.8%) of patients have failure to insert catheter puncture, 7 (24.1%) of patients have puncture of subclavian artery, 6 (20.7%) of patients have inadvertent entry of the catheter into internal jugular vein, 16 (55.2%) of patients have bleeding, 18 (62.1%) of patients have the infection of the catheter’s orifice, 17 (24.1%) of patients have infectious endocarditis, 17 (58.6%) of patients have thrombosis of subclavian vein, 8 (27.6%) of patients have delayed pneumothorax, 16 (55.2%) of patients have insufficiency flow, 17 (58.6%) of patients have bacteremia related with the catheter. Finally, 7 (24.1%) of patients have the accidental extrusion of the catheter (Table 1, Figure 1).

<table>
<thead>
<tr>
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<th>Frequency (total 29)</th>
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<tr>
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<td>puncture of subclavian artery</td>
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<td>inadvertent entry of the catheter into internal jugular vein</td>
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<td>bleeding</td>
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<td>Yes</td>
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### Discussion

The results of the present study show that the higher percentage of the study sample with in age group (41 – 52) years old. (10) pointed in their study that the highest percent “84 (42.0%) were in 40-59 age group”. (11) find that the majority of study sample were between 41-50 age years.

Regarding to the study subjects gender, the results indicate, that the majority of the study sample are males. Which is in consistency with (12), they mentioned that “the characteristics of the studied patients was 80: 47 (58%) men and 33 (42%) women”.

Regarding to marital status, the majority of study sample are married. This result is agreed with (13), he found that the highest percentage is for married patients. In addition, it’s clear that the patients in the same age are often married when compared with those with early age groups. Also those patients are part of the east population; those population often marry early, as compared with other people from other cultures.

In regarding to the duration of disease, the majority is for those who are suffering from the disease for more one year, which is in consistency with (14) in his dissertation “Internal Jugular Vein Cannulation with Two Silicone

<table>
<thead>
<tr>
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<td>11</td>
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<td>infectious endocarditis</td>
<td>7</td>
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<td>0.05</td>
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<tr>
<td>thrombosis of subclavian vein</td>
<td>17</td>
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<td>delayed pneumothorax</td>
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<td>hemotorax</td>
<td>3</td>
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</table>

<table>
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<th>P-value</th>
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<tbody>
<tr>
<td>hematoma</td>
<td>1</td>
<td>28</td>
<td>0.03</td>
</tr>
<tr>
<td>insufficiency flow</td>
<td>16</td>
<td>13</td>
<td>0.05</td>
</tr>
<tr>
<td>bacteremia related with the catheter</td>
<td>17</td>
<td>12</td>
<td>0.07</td>
</tr>
<tr>
<td>the accidental extrusion of the catheter</td>
<td>7</td>
<td>22</td>
<td>0.08</td>
</tr>
</tbody>
</table>

**Fig. 1: The complication of double lumen subclavian catheter**

P-value < 0.05: significant relationship
Rubber Catheters: A New and Safe Temporary Vascular Access for Hemodialysis” who mentioned that the majority of study subjects suffer from disease < 1 year.

In addition to the duration of dialysis, the majority of study subjects are dialyzed for period one year and less than. (15), in agreement with this result they found that the majority of study subjects were use dialysis for (>6 months).

Double lumen subclavian catheter for hemodialysis is preferred by many because catheters can be left in longer than femoral or jugular catheters in mobile patients. However, subclavian vein catheterization is associated with a variety of complications including failure to insert catheter puncture, puncture of subclavian artery, inadvertent entry of the catheter into internal jugular vein, bleeding, the infection of the catheter’s orifice, infectious endocarditis, thrombosis of subclavian vein, delayed pneumothorax, hemothorax, hematoma, insufficiency flow, bacteremia related with the catheter and the accidental extrusion of the catheter.

This result is supported by many previous study (10,12,16), they mentioned that many complication occur with insertion of subclavian catheter. Also all them mentioned that “the most common complication were failure to cannulate (4%) and inadvertent arterial puncture (4%). In adventent arterial puncture in our study was similar to a study by (6) in which it was found that Arterial puncture occurred in 9.7% among on which 13 had resultant subcutaneous hematoma. This might be due to less prominent anatomical landmarks for subcutaneous insertion and deeply located veins requiring steeper angle for catheterization. The second commonest complication was mal-positioning/kinking in 2% cases. Some of the insertion related complications can be reduced with the aid of image guidance during catheter placement. However the use of ultrasound guidance during subclavian venous catheterization had mixed results in clinical trials, probably for anatomical reasons”.

Some of the above mentioned complications are comparatively low in number probably because of the small size and majority of the insertions were carried out by the well-trained personnel. Also stated the patients that had catheter at the initiation of the dialysis presented a higher morbidity and mortality than those who have had a fistula – the survival at 12 months was 60% vs. 83%.

Concerning the result related to associations between duration of disease and clinical data for patients with ESRD: The present study reveals that there is no significant association between study subject duration of disease and their clinical data. These finding agrees with a study of (10), in their study “Complications of Insertion of Double Lumen Catheter in Subclavian Vein in Patients of Renal Failure” they stated that there is no significant association between patients’ duration of disease and complication of cannulation.

**Conclusions**

According to the result of present study, the researcher concluded that: double lumen subclavian catheter for hemodialysis is preferred by many because catheters can be left in longer than femoral or jugular catheters in mobile patients but this access associated with many sever complications like (bleeding, infection of the catheter’s orifice, thrombosis of subclavian vein, insufficiency flow and bacteremia related with the catheter), also the result shows that there is no significant relationship between socio-demographic data and double lumen subcalvian catheter complications.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Nutritional Status Assessment among Children with Autistic Spectrum Disorder

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¹Medical college, University of Kufa, Iraq; ²Community Medicine, Najaf Health Directorate, Iraq; ³Community Medicine, University of Baghdad, Iraq

ABSTRACT

The childhood Autism was a neurodevelopment disorders that symptoms are appear throughout the patient’s life which is characterized by lack of social & communication interactions in addition to repetitive, restricted interests and behavior. Recent studies revealed that the commonness of Autism Spectrum Disorders is rising, which could be because of diagnostic classification of ASD been updated. An essential step in the autism treatment is earlier detection to convalesce the quality of life of subjects.

The aim is to conclude the nutritional status of ASD children in Al-Najaf province 2015

A descriptive cross–sectional study conducted to evaluate state of nutrition in children with autism. Convenient model of autistic children in (Al Imam Al Husain Institute of Autism) and autistic patients in psychiatric department in AL-Hakeem hospital from 30th of April 30th of August 2015. The data were collected by questionnaire developed and filled by investigator through direct interview with autistic patient parents that visit psychiatric department in Al-Hakeem hospital and from case study sheet that present in AL-Imam Al Husain Institute of Autism which include ID, gender, residency, age of child (or date of birth??), the age level of education of parents, their occupation, and by measuring weight and height of children and compare with wt./age, wt/ht, ht/age & BMI/age growth charts. Epi-info software and Excel sheet for entry and analysis of data.

The sample size was 98 child, 86 boys and 12 girls & males to females ratio was 8:1, age groups were (28%) ≤ 5yr,72 % more than 5 year in which (52%) of them were normal, (33.9%) were overweight and (14%) were underweight, (28%) of the ≤5yr. were (45%) of them were overweight (37%) of them had underweight,& (16%) were normal, no significant association between the nutritional state with gender, residency, father’s oldness, mother’s oldness, father’s vocation, mother’s vocation, father’s scholastic achievement and but there were significant association between level of education of mother and age group. p value 0.03. and between age group of children and NS p value less than 0.0000.

Most cases below and equal 5 yrs. were overweight& obese 45% and large percent of above 5years 33% were overweight & obese, there is significant associations between nutritional status and level of education on of mothers for children >5 years and NS.

Keywards: Autism Spectrum Disorders (ASD), Pervasive Developmental Disorders group (PDD).

Introduction

The Autism Spectrum Disorders (ASD) is characterized of sober Neuro-developmental disorders, categorized as symptoms of the Pervasive Developmental Disorders group (PDD). The disorder often develops in the first three years of lifespan [1]. Its described by a distinct weakening in social interaction, suspended employment of linguistic and constrained configurations of behavioral; labelled as a triad

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of behavioral impairments. In add-on, autistic kids commonly exhibit serious behavioral instabilities, such as hostility, irritabilities and self-mutilating conduct [2, 3]. The occurrence of ASD is growing global. It is anticipated that at tiniest 10-20 per 10 thousand babies are born yearly with autism [4].

Whilst autism is exceedingly inheritable, investigators questionable both ecological and genomic dynamics as triggers [5]. In erratic suitcases, autism is strappingly concomitant with proxies that because birth absconds[6]. Arguments mount other projected ecoterrorist origins [7], for instance, the vaccine postulations have been refuted. Autism touches information managing in the brain by modifying in what way nerve cells and their synapses associate and unify; in what way this ensues is not satisfactory comprehended [8]. It remains lone of three predictable illnesses in the autism spectrum disorders (ASDs), the other two actuality Asperger syndrome, which absences postponements in cognitive elaboration and speech, and pervasive developmental disorder, not else specified which is spotted when the packed traditional of standards for autism or Asperger syndrome are not encountered [9].

Prompt idiom or behavior intercessions can aid kids with autism advance self-care, societal, and communication proficiencies [2]. Though nearby is no notorious therapy [2], there have been recounted patients who improved [10]. Not countless autistic patients alive autonomously after accomplishment maturity, nevertheless fewer suited fruitful [11]. An autistic society has established, with some personages pursuing a treatment and others deeming autism must be acknowledged as a dissimilarity and not cured so an illness [12].

The aim is to conclude the nutritional status among ASD children in Al-Najaf province.

**Materials and Method**

**Data Collection Time:** From 30th of April 30th of August 2015.

**Study Population Sampling:** Convenient sample patients with autism in (Al Imam Al Husain Institute of Autism) and autistic patients in psychiatric department in AL-Hakeem hospital.

Inclusion criteria all patient from age 3—19 years old and diagnosed as ASD.

Exclusion criteria every patient that visit psychiatric department and present in Al Imam Al Husain Institute of Autism) to avoid duplication of patient, and all patient less than 3 years old because ASD not diagnosed before that age and not more 19 years old.

**Data Collection Tools:** By questionnaire developed and filled by investigator through direct interview with autistic patient parents and from case study sheet the questioner including ID, gender, residency, age of child, father’s oldness, mother’s oldness, father’s & mother’s scholastic achievement etc. and by measuring weight of children in kilogram using UNICEF SCALE which using in screening after standardization and measuring the height of children in centimeter by stadiometer after bearing of feet and standing in upright position and by using growth charts weight for age and sex (normal if the point of intersection between age and weight at normal line of Z score, above if point of intersection between age and weight above normal line of Z score, below if point of intersection between weight and age below normal line of Z score), length for age and sex (normal, above, below by consuming Z results), weightiness on behalf of length and gender for kids fewer than five years (Z scores) and BMI for age and either normal, hazard of weighty, fatness, wasting & greater wasting) and weight for age and sex, age for height sex, and BMI for age and sex charts for children above 5 years old. Epi-info software and Excel sheet for entry and analysis of data. Family writing consents approved before measuring height and weight.

**Limitations**

1. Some child with ASD hyperactive so too difficult to get uprights position to measure the weight of child.
2. Increase days’ number of holidays because of hot weather that limit sample size.

**Results**

The whole selected sample was 98 children with ASD, the reported age range from 3-11years (39 -129) months, the mean age was 72.7 months with (stander deviation = ± 18.8) month, 86 of them were males & 12 were females, The males to females’ ratio 8:1. (Figure 1).
The majority of the age group 72% more than 5 years, 28% was less than 5 years which is shown in Figure (2).

Most of the cases found in urban region (86%) and (13.9%) in rural area (Figure 3).

The father ages range from 20- 50years; most of them (53%) were within 30-39 years age group, (34%) in 40-49 years age group and (12%) within age group 20-29 years as shown in Figure (4).

While the age of the mothers was ranged between 15-45 years in 3 main age groups most of them (48%) within the age group 25-34 years, (41%) of them within 15-24 years and the minority (11%) within age group 35-44 years as in Figure (5).

The educational levels of the fathers ranging from literate to post graduate studies & most of them were colleges graduated (54%), (35%)were secondary level, (8.2%) were primary level while post graduates form only (2%) as in Figure (6).

The levels of education of the mothers were (47%) of them were colleges graduates,(35%)were secondary levels, 16% primary levels and (1%) were illiterate.

Regarding the occupation of the fathers (48%) of them were employed, while the remainder were police men, workers and others. While most of the mothers were housewives, employs, worker and the others (students).

It was found that 50% of the autistic children were high weight for age by using weight for age and sex growth chart, while 31% were wasting and just 19% is normal.

By using the height for age growth chart it was found that 51% of the autistic children were above normal, 36% were below normal while just 13% were normal.
The weight for height chart showing that 62% of children less than 5 years old were above normal, 29% of them were below normal while only 8.3% of them were normal.

About (23%) of all sample size were below or equal to 5 years old, who were distributed according to their BMI & by using the BMI for age chart & found that 11(45%) of them were overweight, 9 (37%) of them had wasting, & 4 (16%) were normal. While in children over 5 years with ASD 74 (72%) out of the total sample it was found that 38 (52%) of them were normal, 25 (33%) were overweight and 11 (14%) were underweight.

By testing the association between the nutritional status with gender, residency, father’s oldness, mother’s oldness, father’s employment, mother’s employment, scholastic achievement of fathers and mothers it was discovered that there were not at all significant association, but there was a significant association between nutritional grade and level of schooling of mother and nutritional state and age groups.

**Discussion**

The total no. of sample size is 98, males to females’ ratio 8:1 higher than the study done in [13] in which it was four times among boys (4:1) than girls, this may be due to small sample size or may be the family concentrate attention toward male than female.

The majority were found in urban area which may reflect that the people in rural remote sites lack of autism signs awareness by parents and even by doctors, in addition to limited psychiatric health services in Al-Najaf where there is only one psychiatric department in one hospital (Al-Hakeem general hospital) which is located in center of Al-Najaf which is responsible to diagnose ASD and there is no psychiatric department in rural area.

Regarding the educational levels of the fathers & mothers of the ASD cases; most of them (47% of mother cases & 53% of father cases) were college levels because they were alert to their abnormal child’s behaviors than those in the other levels, and could be also due to their high socioeconomic status.

Regarding the occupation of the fathers most of them were employee (48%) like physician, engineer, teache etc., which reflect their educational levels and their awareness toward their children [13]. The same is true for the occupation of the mothers where 46% of total sample size were college levels, but most of them were housewives 60% which may be due to special care needed for their children.

The weight for age nutritional status assessment 50% of cases were obese & overweight which can stay accredited to that the offspring per autism were further often over heaviness competed to those with Attention Deficit Hyperactivity Disorder (ADHD) and to an age accorded allusion populace [2]. Others reveal that over-eating remains unique of furthermost corporate adverse consequence of medicine secondhand for tension linked behaviors in autism disorders [3].

The height for age assessment 51% of them were tall for their age, this is may be related to their good nutritional status & overweight.

The BMI chart for age. For children 5 years old & less, there is frank percent (45%) of overweight or obese, and for children larger than 5 years old the overweight and obesity were (33%) of sample size, this is due to patients with ASD consumed be stated to have unfamiliar eating traditions, which well-known that patients with ASD have distastes to particular surfaces, insignia, aromas, heats, and trademark labels of nutrients, with some partialities for lenient and sweetened foodstuffs [4-7].

High percentage of overweight & obesity is similar to national study conducted in Karbala [14] were obese and overweight forms 54% of total sample size. In, Scheck et al. [8] who conveyed that broods with autism validated added diet discrimination than characteristically emerging kids and they favored vigor condensed nourishments within diet clusters for instance chicken nugget, peanut lard, cake, sausage etc.). In totaling, persons may have nonconforming bodily commotion and consumption designs that are exclusively linked with the progress of fatness, & they are acknowledged to have motor deficiencies that may unfavorably disturb their capability partakes in sporting or corporeal accomplishments magnificently. Such motor deficiencies incorporate deprived motor proficiencies, unfairness of child-development milestone attainment, little muscular tone, mouth motor complications, & postural unsteadiness [9-12]. In toting, kids plus ASDs
may knowledge little intensities of physical commotion owing to their deficiencies in community proficiencies which might edge contribution in systematized behaviors with colleagues. Indeed, a modern report discovered that praxis/motor scheduling in kids with autism was powerfully connected among the societal, communicative, & behavior deficiencies that demarcate the illness [15].

Other study done in USA 2004 exploiting body mass index pro oldness & gender [16] which amount the occurrence of obesity in offspring amid long-lasting illness, this study unearthed that the commonness of obesity amongst kids thru autism was 23.4%. In toting to the report completed by Carol Curtin [17] wherever the occurrence of obesity in Autistic’s children was 30.4% which proximate the outcome in existing study?

In this study by testing the association between the nutritional status with gender, residency, age of the fathers, & mothers, occupation of the fathers, & mothers, educational level of the fathers and mothers it was found that there were no significant association, but nearby existed a significant relationship amongst nutritional state & scholastic accomplishment of moms were most of the normal weight children more than 5 years old in non-college level may be due to those mothers spent more time with their children and care about them than those with college level most time are busy and the children receive the attention from other person. Other significant association between nutritional status and age groups could be due to most of the sample size 62% of children from 6-8 years were normal weight.

Conclusion

Most cases below and equal 5 yrs. were overweight & obese 45% and large percent of above 5 years 33% were overweight & obese, there is significant associations between nutritional status and level of education on of mothers for children >5 years and NS.

Recommendations

1. Nutritional education of the mothers of ASD children about dietary pattern and avoid high caloric meals and encourage healthy foods

2. Training courses to parent, teacher in kindergarten and schools GP doctors about early detection of ASD in early childhood.

3. Media coverage in considering the predisposing factors stated in development the constellation of sign and symptom of ASD

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCE


10. Wing, L., & Potter, D. The epidemiology of autistic spectrum disorders: Is the prevalence


In vitro Experimental Research for Using the Silver Nanoparticles as Plasmid Curing Agent in Some Types of Multi-Antibiotic Resistant Pathogenic Bacteria

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ABSTRACT

Background: Nanomaterials, between the present scenarios, bear born new avenues in medicine, diagnosis, or therapeutics. In try concerning this, the present-day discipline goals in imitation of deciding the working efficiency concerning silver nanoparticles in accordance with treatment plasmids of bacteria.

Method: A total of sixteen multi-antibiotic resistant isolates made up of 4 (25%) Escherichia coli, 4 (25%) Pseudomonas aeruginosa, 4 (25%) Staphylococcus aureus and 4 (25%) Streptococcus pyogenes were collected from different samples of burn and wound infections from patients attended to Al-kadhemyiah Teaching Hospital/Baghdad/Iraq. These strains were diagnosed molecularly by PCR on 16S rRNA using primers named 27F and 1492R; which yielding of 1,500bp or extra as shown with sequencing data.

Results: Strains showed multi antibiotic resistance to Gentamycin, Ciprofloxacin, Ofloxacin, Ampicillin, Nitrofurantoin and Erythromycin respectively. Resistance plasmid DNA of multi-antibiotic resistant strains used to be cured with three different concentrations of 0.75, 1.5, and 3 ppm of silver nanoparticles were confirmed by PCR technique for plasmids curing assay where, at 0.75 ppm of silver nanoparticles the plasmid curing percentage relatively were 50%, 75%, 100% and 100% respectively while at 1.5 ppm plasmid curing percentage were 75%, 50%, 100% and 100% and at 3.0 ppm plasmid curing percentage were 100%, 100%, 100%, 100% for (Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus and Streptococcus pyogenes respectively) and cured traces have been again subjected to in vitro antibiotic sensitivity trying out to confirm curing actions.

Keywords: antimicrobial resistance, multi-antibiotic resistance, nanoparticles, silver.

Introduction

Infectious illnesses stay certain regarding the lead motives of vice and mortality worldwide. The WHO and CDC have expressed giant hassle involving the continued extend into the improvement of multidrug drawback amongst bacteria (1). This has caused initiatives world after enhance fresh yet more positive antimicrobial compounds as properly namely in accordance with enhance new delivery then targeting strategies (2). The antimicrobial property concerning silver nanoparticle is the fundamental purpose because its wide-scale usage, which consists of software program inside antibacterial fabrics, cosmetics, cloud filters and medicinal or meals packaging products (3). The bactericidal impact concerning silver among its more than a few chemical varieties has been exploited for the reason that historical civilizations, in the course of the 18th century, silver used to be typically back in accordance with deal with contaminated ulcers, yet greater recently, within the quickly 1920s, Ag-NPs were blanketed because anger treatment by using the US Food and Drug Administration due in accordance with their intensive toxicity in opposition to a huge spread regarding microorganisms (4,5). In this review, we pleasure reduce the contemporary lookup over nanoparticles yet what it is then may be applied in the after fight multidrug strong bacteria.
Also, its animadversion consists of the latest procedures among the development over modern nano biotechnology methods so may additionally project the scientific action after battle bacteria or particularly MDR bacteria.

Materials and Method

Sampling: Nanoparticles form silver were imported from NANO pars SPADANA Technology. The concentration was 4000 mg/l for silver Nanoparticles and six antibiotics were used as follows: gentamycin (GEN), ciprofloxacin (CPR), nitrofurantoin (NIT), ampicillin (AMP), chloramphenicol (CHL) and erythromycin (ERY) were commercially purchased from laboratory achievements; from Sigma Company (St. Louis, MO). In addition, more than 170 wound and burn swabs about sufferer’s reception therapy at the scientific wards of the Al-Kadhemyiah Teaching Hospital/Baghdad, Iraq have been randomly selected. Collection over samples used to be made barring attention because of age, sex, occupation or household background.

Processing over Samples: The silver nanoparticles have been stored in sealed glass bottles kept in a dark area at apartment heat (~25°C) then different concentrations (0.75, 1.5 and 3.0ppm) of silver nanoparticles were prepared from the stock solution of silver nanoparticles that hold the concentration of 4000ppm. Obtained swabs had been made to the laboratory right away for processing. Two swabs were taken from each patient. Swabs were collected in duplicates per a patient. While one was used for Gram staining, the other was used for culture.

Antibiotic Sensitivity Testing: This is used to be once celebrated between pursuance among consequence concerning the modified (6); Disc diffusion technique. Sterile Mueller Hinton agar plates and peptone water were prepared and dispensed into plane tubes in accordance with manufacturer’s instructions.

Phenotypic and genotypic characterization regarding the bacterial strains: Phenotypic characterization was carried out by mounting part of the viable culture and observed under the microscope to determine the morphological characteristics (7). Genotypic characterization of bacteria was carried out using wizard genomic DNA extraction kit, Agarose, Ethidium Bromide Solution (10mg/ml), GoTag Green Master Mix, nuclease free water, absolute ethanol, isopropanol, TAE 40X, Quantifior dsDNA system from Promega, USA (https://worldwide.promega.com/resources/) according to the manufacturer’s instruction.

MIC and MBC undertaking concerning silver nanoparticles: Minimal Inhibitory Concentration (MIC) was determined by broth micro-dilution technique based on the protocol described by (8). Cultural growth indicator was used to check the efficacy of nanoparticles against the test organisms. Gentamicin was used as a positive control and bacterial growth in the plate was inspected visually.

Plasmid Extraction: Extraction of bacterial plasmids was done by the following of PureYield™Plasmid Miniprep System protocol. This kit was purchased online and accomplished as provided instructions. (www.promega.com • Phone 608-274-4330 or 800-356-9526 • Fax 608-277-2601)

Plasmid Curing: Plasmid curing of Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli and Pseudomonas aeruginosa strains that were antibiotics-resistant (did not show any zone of inhibition after incubation on Muller Hinton agar plates) where done by, to 10ml of overnight nutrient culture broth of it with different concentrations (0.75, 1.5 and 3.0ppm) of silver nanoparticles were added. The resulting of serial suspensions were then used as stock solutions and then incubated for up to 2 days then tested for presence of plasmid(s) or not by PCR technique.

In vitro Antibiotic Sensitivity Testing concerning Cured Strains: Plasmid cured traces have been once more subjected according to antibiotic sensitivity testing in accordance in imitation of the approach about Kirby-Bauer meanwhile described above.

Statistical Analysis: Statistical evaluation was performed using SPSS version 21.0.0 software program (SPSS Inc, Chicago, USA).

Results

Out of the 170 samples processed, only 120(71.0%) strains were isolated, made up of 41(35.0%) Staphylococcus aureus, 22(19.0%) Streptococcus pyogenes, 19(16.0%) Escherichia coli and 36(30.0%) Pseudomonas aeruginosa strains were obtained. In addition, results of current study showed that 8(19.5%) Staph. aureus, 4(18.1%) Streptococcus pyogenes, 5(26.3%) Escherichia coli and 12(33.3%) Pseudomonas aeruginosa strains showed multi-antibiotics resistance (Table 1).
Table 1: Occurrence concerning multi antibiotic counteractive traces among samples processed

<table>
<thead>
<tr>
<th>Isolates</th>
<th>No. of strains isolated</th>
<th>No of strains showing multi antibiotic resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>41 (35.0%)</td>
<td>8 (19.5%)</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>22 (19.0%)</td>
<td>4 (18.1%)</td>
</tr>
<tr>
<td><em>E. coli</em></td>
<td>19 (16.0%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>Pseud. aeruginosa</td>
<td>38 (30.0%)</td>
<td>12 (33.3%)</td>
</tr>
<tr>
<td>total</td>
<td>120 (100.0%)</td>
<td>29</td>
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</tbody>
</table>

From all the isolates mention above, a total of sixteen isolates made up of 4 (25%) Staphylococcus aureus, 4 (25%) Streptococcus pyogenes, 4 (25%) Escherichia coli and 4 (25%) Pseudomonas aeruginosa which were diagnosed as multi-antibiotic resistant strains where chosen to check their antibiotics sensitivity before and after curing by treatment with different concentrations of 0.75, 1.5, and 3 ppm of silver nanoparticles as a curing agent.

**Bacterial Strains Diagnosis:** *In vitro* genotypically, the chosen strains were diagnosed by PCR amplification, agarose gel electrophoresis was adopted to confirm the presence of amplification. All processes including Bacteria gDNA extraction, PCR amplification, sequencing and assembly. For these Bacteria, PCR on 16S rRNA using 27F and 1492R primers and yielding 1,300 bp or more sequencing data. The presence of 16s RNA genes of unknown bacterial species were fractionated on 1% agarose gel electrophoresis stained with Eth.Br. Lane 1: 100 bp DNA marker (Figure 1)).

**Standard Sequencing:** PCR product was sent for Sanger sequencing using ABI3730XL, automated DNA sequencer, by Macrogen Corporation – Korea. The results were received by email then analyzed using genious software.

**Figure 1:** PCR amplification of 16s RNA gene of bacterial species was fractionated on 1% agarose gel electrophoresis stained with Eth.Br. Lane 1: 100 bp DNA marker.
Minimum Inhibitory Concentration and Minimum Bactericidal Concentration: The MIC and MBC of silver nanoparticles against all chosen multi-antibiotic resistant bacterial strains in this study were found to be 0.75 and 3ppm, respectively.

Curing Activity of Silver Nanoparticles: The results of using silver nanoparticles at different concentrations (0.75, 1.5, and 3ppm) against chosen multi-antibiotic resistant bacterial strains to check their plasmid curing activity was cleared by their actions in comparison with six antibiotics sensitivity tests % (gentamycin, ciprofloxacin, ofloxacin, ampicillin, nitrofurantoin and erythromycin) before and after treatments (Tables 2, 3 and 4).

Table 2: In vitro, summary of resistance pattern of *Streptococcus pyogenes* after curing with different concentrations (0.75, 1.5, and 3) ppm of silver nanoparticles

<table>
<thead>
<tr>
<th>No. of strain</th>
<th>Organisms</th>
<th>Conc. of Ag NPs ppm</th>
<th>Percentage of resistance (%)</th>
<th>Change (Reduction) in Resistance (%)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Strept. pyogenes</td>
<td>0.75</td>
<td>GEN 100 CPR 0 OF 70 AMP 100 NIT 100 ERY 80</td>
<td>50 GEN 70 CPR 50 OF 50 AMP 50 NIT 55 ERY 45.8</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Before 100 0 70 100 100 80</td>
<td>After 50 0 70 50 50 25</td>
<td></td>
<td>50 GEN 70 CPR 50 OF 50 AMP 50 NIT 55 ERY 45.8</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Change (Reduction) in Resistance (%)</td>
<td>75 0 70 75 100 80</td>
<td>66.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Before 100 0 70 100 100 80</td>
<td>After 25 0 70 25 0 0</td>
<td></td>
<td>75 GEN 100 CPR 100 OF 100 AMP 100 NIT 100 ERY 75</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Change (Reduction) in Resistance (%)</td>
<td>100 0 70 100 100 80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After curing, *Staphylococcus aureus* didn’t show any sensitivity change to ciprofloxacin (CPR) as all strains remained sensitive before and after treatment with different concentrations (0.75, 1.5, and 3ppm) of silver nanoparticles. There were (50, 50, 50 and 50%) reduction in resistance to gentamycin, ampicillin, nitrofurantoin and erythromycin, respectively, after treatment or curing with concentration 0.75ppm of silver nanoparticles. Also there were (75, 75, 75 and 75%) reduction in resistance to gentamycin, ampicillin, nitrofurantoin and erythromycin, respectively, after treatment or curing with concentration 1.5ppm of silver nanoparticles.

After curing, *Streptococcus pyogenes* didn’t show some sensitivity trade to ciprofloxacin (CPR) so all traces remained sensitive before yet below treatment along special concentrations (0.75, 1.5, and 3ppm) of silver nanoparticles. There were (50, 50, 50 and 55%) reduction within resistance in conformity with gentamycin, ampicillin, nitrofurantoin and stability erythromycin, respectively, afterwards cure yet curing with awareness 0.75ppm concerning silver nanoparticles. However, every line remained preventive after ofloxacin before then below curing (Tables 3). On average, at that place have been (45.8, 66.6, and 75 %) reduction between obstruction to the antibiotics since curing at concentrations (0.75, 1.5, and 3ppm) of silver nanoparticles, respectively.
Table 3: *In vitro*, summary of resistance pattern of *Escherichia coli* after curing with different concentrations (0.75, 1.5, and 3) ppm of silver nanoparticles

<table>
<thead>
<tr>
<th>No. of strain</th>
<th>Organisms</th>
<th>Conc. of Ag- NPs ppm</th>
<th>Percentage of resistance (%)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>E. coli</td>
<td>0.75</td>
<td>GEN 75, CPR 75, OF 80, AMP 100, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Before</td>
<td>GEN 100, CPR 75, OF 80, AMP 100, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After</td>
<td>GEN 75, CPR 50, OF 60, AMP 75, NIT 75, ERY 75</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change (Reduction) in Resistance (%)</td>
<td>GEN 25, CPR 25, OF 20, AMP 25, NIT 0, ERY 25</td>
<td>20</td>
</tr>
<tr>
<td>1.5</td>
<td></td>
<td>Before</td>
<td>GEN 100, CPR 75, OF 80, AMP 100, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After</td>
<td>GEN 50, CPR 25, OF 40, AMP 50, NIT 75, ERY 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change (Reduction) in Resistance (%)</td>
<td>GEN 50, CPR 50, OF 20, AMP 0, NIT 25, ERY 50</td>
<td>36.6</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Before</td>
<td>GEN 100, CPR 75, OF 80, AMP 100, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After</td>
<td>GEN 0, CPR 25, OF 0, AMP 25, NIT 75, ERY 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change (Reduction) in Resistance (%)</td>
<td>GEN 100, CPR 50, OF 80, AMP 75, NIT 0, ERY 75</td>
<td>63.3</td>
</tr>
</tbody>
</table>

After curing, *Escherichia coli* strains gave (25,25, 20, 25 and 25%) reduction in resistance to gentamycin, ciprofloxacin, Ofloxacin, ampicillin, and erythromycin, respectively, after treatment or curing with concentration 0.75ppm of silver nanoparticles. However, all strains remained resistant to nitrofurantoin before and after curing (Tables 4). On average, there was (20, 36.6 and 63.3%) reduction in resistance to all the antibiotics after curing at concentrations (0.75, 1.5, and 0.3ppm) of silver nanoparticles, respectively.

Table 4: *In vitro*, summary of resistance pattern of *Pseudomonas aeruginosa* after curing with different concentrations (0.75, 1.5, and 3) ppm of silver nanoparticles

<table>
<thead>
<tr>
<th>No. of strain</th>
<th>Organisms</th>
<th>Conc. of Ag NPs ppm</th>
<th>Percentage of resistance (%)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>P. aeruginosa</td>
<td>0.75</td>
<td>GEN 75, CPR 75, OF 100, AMP 100, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Before</td>
<td>GEN 75, CPR 75, OF 100, AMP 100, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After</td>
<td>GEN 50, CPR 50, OF 75, AMP 75, NIT 75, ERY 75</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change (Reduction) in Resistance (%)</td>
<td>GEN 25, CPR 25, OF 25, AMP 0, NIT 25, ERY 25</td>
<td>20.8</td>
</tr>
<tr>
<td>1.5</td>
<td></td>
<td>Before</td>
<td>GEN 75, CPR 75, OF 100, AMP 75, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After</td>
<td>GEN 25, CPR 25, OF 50, AMP 75, NIT 50, ERY 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change (Reduction) in Resistance (%)</td>
<td>GEN 50, CPR 50, OF 0, AMP 0, NIT 50, ERY 50</td>
<td>45.8</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Before</td>
<td>GEN 75, CPR 75, OF 100, AMP 75, NIT 75, ERY 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After</td>
<td>GEN 0, CPR 0, OF 25, AMP 25, NIT 75, ERY 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change (Reduction) in Resistance (%)</td>
<td>GEN 75, CPR 75, OF 75, AMP 100, NIT 0, ERY 75</td>
<td>66.6</td>
</tr>
</tbody>
</table>

In concerning to *Pseudomonas aeruginosa* strains after curing, they gave (25,25, 25, 25 and 25%) reduction in resistance to gentamycin, ciprofloxacin, Ofloxacin, ampicillin and erythromycin, respectively, after treatment or curing with concentration 0.75ppm of silver nanoparticles. Also there were (50, 50, 75, 50 and 50%) reduction in resistance to gentamycin, ciprofloxacin, Ofloxacin, ampicillin and erythromycin, respectively, after treatment or curing with concentration 1.5ppm of silver nanoparticles as well as there were (75, 75, 75, 100 and 75%) reduction in resistance to gentamycin, ciprofloxacin, Ofloxacin, ampicillin and erythromycin, respectively, after treatment or curing with concentration 3.0ppm of silver nanoparticles.
Curing activity of silver nanoparticles: In vitro genotypically, the results of using silver nanoparticles at different concentrations (0.75, 1.5, and 3ppm) against chosen multi-antibiotic resistant bacterial strains to check their plasmid curing activity is cleared by their actions by applying PCR manifestation or agarose gel electrophoresis was adopted after ensuring the presence concerning manifestation earlier than yet then treatments (Figure 2).

These results clarify that the curing activity of different concentrations of silver nanoparticles (0.75, 1.5 and 3.0ppm) against these selected strains. The curing percentages were 50%, 75%, 100% and 100%, respectively, while at 1.5ppm plasmid curing percentages were 75%, 50%, 100% and 100%, however, at 3.0ppm plasmid curing percentage were 100%, 100%, 100% and 100% against Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus and Streptococcus pyogenes, respectively. Each percentage recorded above evaluated as numbers of band missing or standing in each adding curing agent (silver nanoparticles).

**Discussion**

Over the preceding not many decades, even has been a developing pastime concerning exploring alternative techniques after format then develop present day antimicrobials appropriate between conformity including the excellent study concerning microbial resistance in the direction of oft ancient antibiotics (9). Silver nanoparticles (Ag-NPs) hold learnt significant activity due to imitation along their alluring physicochemical homes. Several reports have shown so nanoparticles committed above about extraordinary basic metals execute lie back to flail each stopping then nonresistant bacterial strains (10). Ultimately, within current manuscripts, a lot on researchers improve in their workshop so silver nanoparticles so focused on multidrug stopping bacteria as S. aureus, E. coli, P. aeruginosa along extraordinary mechanisms on antibacterial moves as like bacteriostatic and bactericidal agent (11), it attempts hold been widely explored due to the fact that they furnish environmentally friendly or reasonably-priced routes in conformity with the synthesis over metal nanostructures, within addition in imitation of being effortlessly scalable production processes.

**Conclusion**

Resistance plasmid DNA of multi-antibiotic resistant lines used to be cured with three different concentrations of 0.75, 1.5, and 3ppm of silver nanoparticles were confirmed by PCR technique for plasmids curing assay where at 0.75ppm of silver nanoparticles the plasmid curing percentage relatively were 50%, 75%, 100% and 100%, respectively, while at 1.5ppm plasmid curing percentage were 75%, 50%, 100% and 100% and at 3.0ppm plasmid curing percentage were 100%, 100%, 100% and 100% for Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus and Streptococcus pyogenes, respectively, and cured traces have been again subjected to in vitro antibiotic sensitivity trying out to confirm curing actions.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both
environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


The Compatibility between the Neem Oil of *Azadirachta Indica* and *Bacillus Thuringiensis* in Controlling Fig Moth (*Ephestia Cautella*)

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ABSTRACT

**Background:** Fig moth *E. cautella* (Lepidoptera: Pyralidae) is an economically important pest in the world, because it infects the storage product of wide range of agricultural crops specially grains and their derivative foods. This has directed the need for development of alternative strategies which are safe, low cost and effective against pest and the more important strategy is the biocontrol which includes the use of pathogens, parasitoids and plant extract. This study was conducted to evaluate the activity of the neem oil of *Azadirachta indica* and *B. thuringiensis* alone and in combination in controlling fig moth *E. cautella*.

**Method:** the study evaluated the effect of *Bacillus thuringiensis kurstaki* on larvae of *E. cautella*, the effect of Neem oil in the larvae of *E. cautella* and the the combined effect of *B. thuringiensis kurstaki* and Neem oil on larvae of *E. cautella*. Statistical analysis was conducted using completely randomized design CRD and Duncan test. Probit analysis was used to obtain the median lethal concentrations (LC₅₀) in addition to the median lethal time (LT₅₀), within SPSS system version 20.

**Results:** The results showed that there was significant increase in the effect of *B. thuringiensis* with increasing the concentration on the larvae of fig moth and the percentages of death were 9.7% and 50% at the concentrations 0.01% and 0.1%, respectively, after one day of treatment with a median lethal concentration (LC₅₀) 0.1 and increased to 53% and 100%, respectively, after four days of treatment with LC₅₀ of 0.008%. The effect of neem oil on the larvae of *E. cautella* showed a marked variation with the concentrations. The effect of the combination of *B. thuringiensis* and neem oil showed an increase in the mortality rate of larvae treated with both of them compared with the treatment of each separately.

**Conclusion:** *B. thuringiensis* and neem oil induced significant insecticidal effects on larvae of *E. cautella*, higher mortality was observed when the larvae were treated with both *B. thuringiensis* and neem oil in comparison to larvae that were treated with only one of these bioinsecticides. There were no indications of any side effects on human, environment and natural enemies.

**Keywords:** *Ephestia cautella*, Biocontrol, *Bacillus thuringiensis*, Neem oil, LC₅₀

Introduction

Fig moth *E. cautella* (Lepidoptera : Pyralidae) is an economically important pest in the world, because it infects the storage product of wide range of agricultural crops specially grains and their derivative foods. This has directed the need for development of alternative strategies which are safe, low cost and effective against pest and the more important strategy is the biocontrol which includes the use of pathogens, parasitoids and plant extract[1].
**B. thuringiensis** are gram positive bacteria, spores producing bacteria and have good characters that make them good biocontrols. It produces certain protein called Cry- protein that has insecticidal activity and was used commercially as a biopesticide.\[2\] The neem plant *A. indica* (Meliaceae) distributed in tropical and subtropical regions throughout the world and has been given much attention due to its chemical components.\[3\] Another study showed that the azadirachtin may directly influence the growth and development of treated insects through the inhibition of growth, death of larvae and decrease of age and fertility.\[4\] The individual effects of biocontrol agents have been well studied on different pest insects, but there are relatively few studies on the combined effects of them; therefore, current study was aimed to study the effects of neem oil and *Bacillus thuringiensis* alone and in combination on the fig moth (*E. cautella*).

**Materials and Method**

**Effect of Bacillus thuringiensis kurstaki on larvae of E. cautella:** Toxicity of *B. thuringiensis kurstaki* for the larvae of *E. cautella* was tested by exposing the fifth larval stage to 0.01%, 0.03%, 0.05% and 0.1% of bacterial suspension, as follows: 1) Direct spraying of each concentration, and then transfer the larvae to petri dishes containing 5g of diet. 2) Feeding on mixture of diet and bacterial suspension (3ml/10g), 3) treat the larvae by contamination the pieces of filter paper with bacterial suspension in the Petri dishes containing 5g of diet. 4) Control treatment by use of distilled water as an alternative to bacterial suspension of all previous exposure conditions. All treatments (3 replicates, 10 larvae/replicate) incubated under the same conditions of rearing, the larvae were monitored and rate of daily mortality was calculated.

**Effect of Neem oil in the larvae of E. cautella:** The effect of neem oil on fig larvae was evaluated by exposing the fifth larval stage to 0.0, 0.5%, 1%, 2%, 3% and 5% of the neem oil with 0.01% Tween-80 to facilitate solubility and emulsification with all cases described in the previous paragraph. All treatments (3 replicates, 10 larvae/replicate) incubated under same conditions of rearing, the larvae were monitored and rate of daily mortality was calculated.

The combined effect of *B. thuringiensis kurstaki* and Neem oil on larvae of *E. cautella*: The synergy between neem oil and Bt was performed by treating the fifth larval stage with 1% neem, 2% neem, 0.01Bt, 0.03Bt, 1% neem+0.01Bt and 2% neem+0.03Bt. All treatments (3 replicates, 10 larvae/replicate) incubated under same conditions of rearing, the larvae were monitored and rate of daily mortality was calculated. The data corrected by using\[1\] equation. The expected mortality of the treatment with a combination of both agents was obtained using the formula: \(E = O_a + O_b \times (1-O_a/100)\); where E represents the expected mortality and \(O_a\) represents the observed mortality caused by the neem alone and \(O_b\) is observed mortality caused by of *B. thuringiensis* alone.\[5\] Chi-squared (\(X^2\)) test was performed by calculating the \(X^2\) value using the formula:

\[X^2 = (O_c - E)^2/E\]

Where \(O_c\) represents observed mortality for combination treatment, and then compared to the table value for df 1 (>3.84). If the calculated \(X^2\) value exceeds the tabulated value, it indicates a non-additive effect (either synergistic or antagonistic) of the two control agents. A significant interaction of neem oil- Bt combination was determined through the difference of \(O_c\) \(\leq\) E, where positive = synergistic and negative = antagonistic. If the tabulated value exceeds the calculated \(X^2\) value, it represents an additive effect at \(P\leq0.05\).

**Statistical Analysis:** Statistical analysis was conducted using completely randomized design CRD and Duncan test. Probit analysis was used to obtain the median lethal concentrations (\(LC_{50}\)) in addition to the median lethal time (\(LT_{50}\)), within SPSS system version 20.

**Results and Discussion**

The effect of *B. thuringiensis* on larvae of *E. cautella*: The results (Table 1) showed that the death of larvae increased significantly with increasing the concentration of bacterial suspension and the percentages of death were 9.7%, 50% at the concentrations 0.01%, 0.1%, respectively. After one day of treatment with a median lethal concentration (\(LC_{50}\)) of 0.1%, the death of larvae increased to 53% and 100%, respectively, after four days of treatment with \(LC_{50}\) of 0.008%.

The percentages of death of larvae were increased also with increasing time after treatment which was 9.75
days after one day of treatment and increased to 53% after four days of treatment at the concentration 0.01% and the LT$_{50}$ was 4.2 days, while the percentages of death of larvae at the concentration 0.1 were 50% and 100% after one and four days, respectively, and the LT$_{50}$ was 1.1 day.

Table 1: The effect of B. thuringiensis on the larvae of E. cautella

<table>
<thead>
<tr>
<th>Bacterial suspension (Concentration)</th>
<th>(%) Death (days after treatment)</th>
<th>LT$_{50}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>0.01%</td>
<td>9.7a</td>
<td>20.3a</td>
</tr>
<tr>
<td>0.03%</td>
<td>30.3b</td>
<td>45.3b</td>
</tr>
<tr>
<td>0.05%</td>
<td>33b</td>
<td>53b</td>
</tr>
<tr>
<td>0.1%</td>
<td>50c</td>
<td>74.3c</td>
</tr>
<tr>
<td>LC$_{50}$</td>
<td>0.1</td>
<td>0.038</td>
</tr>
</tbody>
</table>

There were no significant differences between the exposure methods (Filter paper contamination, Diet or Spray) of larvae to bacterial suspension (Figure 1), but the saturated filter paper was the best one in which the percentage of death was 77%.

Figure 1: Effect of treatment methods of Bt suspension 0.03% on mortality of E.cautella larvae

The color of dead larvae had been changed from white to brown and then black and this may be due to the effect of the toxin of Bacillus thuringiensis. This result agreed with the result of [6] who referred to the dead larvae and pupae of Culex and their color changed to brown and they referred also to the stopped feeding after ingestion of toxin, because the Cry toxin binds to midgut receptor and then inserts into the membrane to form lytic pores and causes septicemia and changed the color to brown.

The effect of neem oil on larvae of E. cautella: The result of the effect of neem oil on larvae of E. cautella (Table 2) showed that the effect was corporate with the concentration and percentage of mortality after one day of treatment was 13.3% at the concentration 0.5% and increased to 37, 42, 47 and 64% at the concentrations 1, 2, 3, 5%, respectively, and the LC$_{50}$ was 2.78%. The percentages of mortality increased after four days of treatment which were 44%, 91% at the concentrations 0.5 and 5%, respectively, and the LT$_{50}$ was 4.99 days at the concentration 0.5% and decreased to 0.7 day at the concentration 5%.
Table 2: Effects of neem oil on larvae of *E. cautella*

<table>
<thead>
<tr>
<th>Neem oil (Concentration)</th>
<th>(%) Mortality of larvae (Days after treatment)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>LT&lt;sub&gt;50&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.99</td>
</tr>
<tr>
<td>1%</td>
<td></td>
<td>13.3a</td>
<td>23.3a</td>
<td>36.6a</td>
<td>44a</td>
<td>4.99</td>
</tr>
<tr>
<td>2%</td>
<td></td>
<td>37b</td>
<td>47.7b</td>
<td>57.3b</td>
<td>73b</td>
<td>1.83</td>
</tr>
<tr>
<td>3%</td>
<td></td>
<td>42b</td>
<td>64c</td>
<td>74.7c</td>
<td>84b</td>
<td>1.41</td>
</tr>
<tr>
<td>5%</td>
<td></td>
<td>47.7c</td>
<td>69.3cd</td>
<td>76c</td>
<td>87bc</td>
<td>1.27</td>
</tr>
<tr>
<td>LC&lt;sub&gt;50&lt;/sub&gt;</td>
<td></td>
<td>2.78</td>
<td>1.35</td>
<td>0.8</td>
<td>0.41</td>
<td></td>
</tr>
</tbody>
</table>

The study of the effects of exposure methods of larvae to neem oil (Figure 2) showed that the saturated filter paper method more effective than other methods and the percentages of mortality of larvae was 43, 54 and 76% after 24, 48 and 72 hr. Lowest percentage of mortality was recorded with the diet method which was 50.4% after 72 hr.

Figure 2: Effect of treatment methods of neem oil 5% on mortality of *E. cautella* larvae

The result also showed that the neem oil elongates the diapause period of treated larvae and emergence of abnormal adults, longest diapause period was recorded at the concentration 5%. These alterations may be due to the effect of alkaloids extracts like phenols and terpenoid which affect the development process like the effect on juvenile hormone which is important in the development of diapause to adult [7].

In this study, the lowest amount of food consumed was observed in larvae, this reduction in feeding was at least partially attributed to a reduction in \( \alpha \)-amylase activity. The level of \( \alpha \)-amylase may be a key factor in the efficient propagation of this pest insect [8].

Moreover, [9] mentioned that the neem oil was more effective than the insecticide Hocklicombi in the inhibition of the emergence of adults through the development of the fig moth *E. cautella*. Also, [2] recorded that the LC<sub>50</sub> of neem oil against the pest *H. armigera* was 12.95 mg/ml and affects the age length, productivity of female and the diapause emergence, the LC<sub>50</sub> of *Bacillus thuringiensis* against the same pest was 96.8 mg/ml.
The results also were in agreement with the result of \[10\] who found that the neem extract caused concentration-dependent effects on the mortality of pupae and the pupae that failed to emerge in adults had multiple abnormalities.

**Integral effect of *B. thuringiensis* with neem oil against larvae of *E. cautella*:** The study of the effects of the combination between *B.thuringiensis* and neem oil against larvae of *E. cautella* (Table 3) showed that there was an increase in death of larvae that were treated with *B.thuringiensis* combined with neem oil compared with larvae that were treated with each one alone. The percentage of death in the case of combination between (1% neem +0.01% Bt) was 80% after four days of treatment, while in the case of *B.thuringiensis* (0.01% Bt) alone was 53.7% and neem oil (1% neem) alone was 73% with significant differences between them.

The median effective time to cause 50% mortality (\(LT_{50}\)) was decreased in all combination treatments compared with the individual treatments and the lowest \(LT_{50}\) was recorded at the combination between 2%Neem + 0.03% Bt which was 0.97 day.

### Table 3: Integral effect of *B. thuringiensis* with neem oil against larvae of *E. cautella*

<table>
<thead>
<tr>
<th>Treatments (Concentration)</th>
<th>% Death of larvae (Days after treatment)</th>
<th>LT(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1 1% Neem</td>
<td>37b</td>
<td>47.7a</td>
</tr>
<tr>
<td>2 0.01% Bt</td>
<td>9.7a</td>
<td>20.3b</td>
</tr>
<tr>
<td>3 1% Neem + 0.01% Bt</td>
<td>40.7b</td>
<td>50.3a</td>
</tr>
<tr>
<td>1 2% Neem</td>
<td>42b</td>
<td>64b</td>
</tr>
<tr>
<td>2 0.03% Bt</td>
<td>30.3c</td>
<td>45.3c</td>
</tr>
<tr>
<td>3 2% Neem + 0.03% Bt</td>
<td>57a</td>
<td>69a</td>
</tr>
<tr>
<td>1 1% Neem</td>
<td>37a</td>
<td>47.7b</td>
</tr>
<tr>
<td>2 0.03% Bt</td>
<td>30.3b</td>
<td>45.3b</td>
</tr>
<tr>
<td>3 1% Neem + 0.03% Bt</td>
<td>44a</td>
<td>60.7a</td>
</tr>
<tr>
<td>1 2% Neem</td>
<td>42b</td>
<td>64a</td>
</tr>
<tr>
<td>2 0.01% Bt</td>
<td>9.7c</td>
<td>20.3b</td>
</tr>
<tr>
<td>3 2% Neem + 0.01% Bt</td>
<td>53a</td>
<td>67a</td>
</tr>
</tbody>
</table>

According to the value of Chi-squared (\(X^2\)), the type of interaction between the two biocontrol agents was additive and there is no synergism between them (Table 4).

### Table 4: Interaction between neem oil and *B. thuringiensis* according to Chi-squared (\(X^2\)) value

<table>
<thead>
<tr>
<th>Treatments and Concentration</th>
<th>(%) Mortality of Larvae</th>
<th>X(^2) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Combination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expected</td>
<td>Observed</td>
</tr>
<tr>
<td>Bt  Neem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01% 1%</td>
<td>53</td>
<td>73</td>
</tr>
<tr>
<td>0.01% 2%</td>
<td>53</td>
<td>84</td>
</tr>
<tr>
<td>0.03% 1%</td>
<td>76</td>
<td>73</td>
</tr>
<tr>
<td>0.03% 2%</td>
<td>76</td>
<td>84</td>
</tr>
</tbody>
</table>

A chi-squared comparison that exceeds 3.84 with df= 1 and \(\alpha= 0.05\) is considered synergistic.
The difference between *B. thuringiensis* and neem oil in their efficacy against *E. cautella* may have resulted from the nature and mode of action of these bioagents and the synergism that shown between *B. thuringiensis* and neem oil may be partially explained by their binding to different receptors on the same midgut cell and targeting same tissue, this cooperation had been reported previously [11].

The synergistic relation between *B. thuringiensis* and neem oil may depend on different factors like the dose that was combined, the mode of action, the type of target pest and the environment. A study [6] was conducted to evaluate the synergistic effect of *B. thuringiensis* and botanical insecticide containing azadirachtin in different sublethal combinations against *Spilarctia obliqua* revealed that there was no synergistic effect observed when treatment was given at level 0.021% of Btk + 0.06% of azadirachtin, but it was observed when treatment was given at level 0.003% of Btk + 0.004% of a zadirachtin and this result was in agreement with that of this study.

**Conclusion**

*B. thuringiensis* and neem oil induced significant insecticidal effects on larvae of *E. cautella*, higher mortality was observed when the larvae were treated with both *B. thuringiensis* and neem oil in comparison to larvae that were treated with only one of these bioinsecticides. There were no indications of any side effects on human, environment and natural enemies so this study indicated that both *B. thuringiensis* and neem oil, either individually or in combination, have significant potential for use in controlling programs of *E. cautella*.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding.

**REFERENCES**


3. Lacey LA, Unruh TR. Biological control of codling moth (Cydia pomonella, Lepidoptera: Tortricidae) and its role in integrated pest management, with emphasis on entomopathogens. Vedalia 2005; 12: 33-60.


ABSTRACT

Background: Lithotriptic technique by shock wave is a common medical method in management of calculi in the kidney. Stones are formed when salts and mineral substances were crystallized in the kidney as an outcome of disturbance in the metabolism. The study objective was to assess lithotripsy technique by shock wave in treatment of kidney stones.

Method: 234 patients were recruited randomly at the period from January to December 2018 at lithotripsy unit in Baquba Teaching Hospital. All patients had kidney stones. Their ages ranged from 18–75 years. Patients were treated by shock waves 1100-4000 impulse per minutes.

Results: This study showed that 33% were females (60% had stones in left kidney, while 40% had stones in right kidney) and 67% were males (69% had stones in left kidney versus 31% who had stones in right kidney), stones size ranged between (7–19) mm. The outcome of treatment by shock waves included: 164 patients had complete breakdown of stones at first session, 43 patients had successful fragmentation of stones at second session and 27 patients had best crushed of stones at third session.

Conclusion: From the obtained outcome in the present study, we concluded that the lithotripsy technique by shock wave was effective and vital procedure for management of kidney stones.

Keywords: Kidney stones, lithotripsy, shock waves, fragmentation.

Introduction

Lithotriptic technique by shock waves is a common medical method for management of calculi in the kidney [1]. In this technique used shock waves with high energy that were generated from lithotripter machine and then these shock waves were concentrated by focusing system and sent into the body, passes through tissues and hit the target (kidney stones) [2] by sequences of shock waves the stone will fragment into small particles which can be excreted out of the body during urination [3]. Calculi are formed when salts and mineral substances were crystallized in the kidney as an outcome of disturbance in the metabolism [4]. There are many factors that lead to form calculi in kidney such as [5]:

1. Dehydration: It is most common factor that contributes to calculi formation.
2. Some disease such as hyperparathyroid. 3- Medications intake.
4. Inflammation in urinary tract.
5. Diet with high protein (especially animal protein), salt, calcium oxalate[6].

Materials and Method

This study included 234 patients. They were included randomly from lithotriptic unit at Baquba Teaching Hospital during the period from January to December 2018, their ages were between (18–75) years. All patients had calculi in the kidney, they were examined by radiography (tacked X-ray picture) to detect location of stones and their size then all of them transmitted to lithotriptic unit for management by shock waves.

The patient was positioned in supine on the treatment table over apparatus (head therapy). Fluoroscopy was used as a guide for detecting location of stones and then
directed shock waves toward stones, sizes of stones ranged (7–19) mm. A sequence of shock waves were required to fragment stones in kidney (different numbers of shock wave impulses were used depending on fragmentation of stones), range of shock waves and energy were increased gradually until reached in some cases a maximum of 4000 shock waves and 9 joule of energy.

**Results**

Table 1: Demographic characteristic of patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males</th>
<th></th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td></td>
<td></td>
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<tr>
<td><strong>Age group/yr</strong></td>
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<td></td>
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<tr>
<td>20 -</td>
<td>5</td>
<td>2.1</td>
<td>6</td>
<td>2.6</td>
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</tr>
<tr>
<td>30 -</td>
<td>62</td>
<td>26.5</td>
<td>28</td>
<td>12</td>
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<tr>
<td>40 -</td>
<td>29</td>
<td>12.4</td>
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<td>60 – 80</td>
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<td>4.3</td>
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<td><strong>Total</strong></td>
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<td>77</td>
<td>33</td>
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<tr>
<td><strong>Site of stones</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Left</td>
<td>109</td>
<td>69</td>
<td>46</td>
<td>60</td>
<td></td>
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<td></td>
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<td>Right</td>
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<td>31</td>
<td>40</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Body Mass Index (Kg/m²)</strong></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>150</td>
<td>95.5</td>
<td>56</td>
<td>84.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean ± SD</strong></td>
<td>22.51 ± 2.17</td>
<td>21.71 ± 2.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Over weight</td>
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<td>4.5</td>
<td>12</td>
<td>15.6</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Mean ± SD</strong></td>
<td>25.81 ± 3.37</td>
<td>27.62 ± 4.11</td>
<td></td>
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<td><strong>Types of stones</strong></td>
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<td></td>
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</tr>
<tr>
<td>Solitary</td>
<td>147</td>
<td>93.6</td>
<td>62</td>
<td>80.5</td>
<td></td>
<td></td>
<td></td>
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<td>15</td>
<td>19.5</td>
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<td><strong>Size of stones (mm)</strong></td>
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<td>7 -</td>
<td>121</td>
<td>51.7</td>
<td>61</td>
<td>26.1</td>
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<td></td>
</tr>
<tr>
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<td>35</td>
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<td>23</td>
<td>9.8</td>
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<td></td>
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</tr>
<tr>
<td>13 -</td>
<td>15</td>
<td>6.4</td>
<td>11</td>
<td>4.7</td>
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<td></td>
<td></td>
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<td>16 – 19</td>
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<td>1.3</td>
<td>7</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Refers to highly significant. P: probability level. df: degree of freedom, X²: chi-squared.*

Table (1) showed that 157(67%) of patients were males, while 77(33%) were females and a higher percentage of patients who had stones in kidney at the age group (30–39) year, including 62(26.5%) males and 28(12%) females. Regarding site of stones, 109(69%) males and 46(60%) females had stones in the left kidney. **Moreover,** according to body mass index, we noted that a high percentage of patients had normal weight where 150(95.5%) of were males and 65(84.4%) were females and regarding types of stones, results from current study indicated that the majority of patients had solitary stones where 147(93.6%) of them were males and 62(80.5%) were females. Furthermore, related to size of stones, we found that common size of stones was between (7–9.9) mm.
Table 2: Distribution of patients by Fragmentation of kidney stones during sessions

<table>
<thead>
<tr>
<th>Variables</th>
<th>First session</th>
<th>Second session</th>
<th>Third session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males Frequency</td>
<td>Females Frequency</td>
<td>Males Frequency</td>
</tr>
<tr>
<td>Age group/yr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20&gt;</td>
<td>5</td>
<td>4</td>
<td>----</td>
</tr>
<tr>
<td>20 -</td>
<td>17</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>30 -</td>
<td>45</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>40 -</td>
<td>18</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>50 -</td>
<td>21</td>
<td>5</td>
<td>----</td>
</tr>
<tr>
<td>60 – 80</td>
<td>9</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>49</td>
<td>26</td>
</tr>
<tr>
<td>Site of stones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>88</td>
<td>33</td>
<td>15</td>
</tr>
<tr>
<td>Right</td>
<td>27</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>Body Mass Index (Kg/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>113</td>
<td>49</td>
<td>23</td>
</tr>
<tr>
<td>Obese</td>
<td>2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>22.91 ± 2.00</td>
<td>21.41 ± 1.63</td>
<td>21.82 ± 1.91</td>
</tr>
<tr>
<td>Types of stones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solitary</td>
<td>109</td>
<td>43</td>
<td>24</td>
</tr>
<tr>
<td>Multiples</td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Size of stones (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total No. (234)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 -</td>
<td>81</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>10 -</td>
<td>20</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>13 -</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>16 – 19</td>
<td>1</td>
<td>3</td>
<td>---</td>
</tr>
<tr>
<td>No. shock waves (Mean ± SD)</td>
<td>2426.3 ± 578.23</td>
<td>2831.2 ± 634.71</td>
<td>3218.25 ± 512.14</td>
</tr>
<tr>
<td>Energy (Mean ± SD)</td>
<td>4.041 ± 0.52</td>
<td>5.311 ± 0.54</td>
<td>6.21 ± 0.5</td>
</tr>
</tbody>
</table>

Table (2) showed that successful fragmentation of stones in 164 patients (115 males and 49 females) at first session and in 43 patients (26 males and 17 females) at second session and indicated that complete fragmentation of stones in 27 patients (16 males and 11 females) at third session.

Discussion

Current study was done to assess lithotripsy technique by shock wave in treatment of stones in kidney. The results showed that the majority of patients had stones where 157(67%) were males and 77(33%) were females, so stones were more prevalent in males due to different factors that contributed to forming stones in kidney as males had larger mass of muscles than females and metabolic abnormalities “tissues were broken-down daily that leads to increase the waste produced from metabolism” [7,8]. Our results showed highly significant difference between both genders (P<0.000), the result conformed those of [9,10].

Regarding age, most of patients who had kidney stones were at age group (30–39) years, this result agreed with [11,12], another study [13] found that more occurrence of renal calculi in patients at age group (30–50) years. The present study demonstrated significant relationship between age and incidence of stones (P<0.001).

According to the site of stone, there was no relationship between localization of stones and their occurrences. We found that 109(69%) of males and 46(60%) of females had stones in left side, this result was in agreement with [14].

In the present work, we found that majority of patients who were with normal weight 150(95.5%) were males and 65(84.4%) were females. Our results were similar to the results of study done by [15].
Patients who had solitary stones were 147 males and 62 were females, whereas 10 males and 15 females had multiples stones. Present study accordant with [16]. A large number of patients, 164 males and 49 females, showed excellent fragmentation of stones at first session, while 43 patients (26 males and 17 females) were treated during second session and remaining 27 patients were managed from stones at the third session, fragmentation of stones were different depending on [17]:

1. The properties of materials that the stones were composed of.
2. Number and energy of shock waves that strike the stones.
3. Respiratory movement may lead to missed shots of shock waves [18].
4. Body mass index affected the results of management, if the patient is overweight, the physician can’t put the stones precisely at the target point [19].

Our results were in agreement with [20,21] as these studies showed successful treatment of stone in kidney by using lithotripsy technique by shock waves.

Conclusion

From the obtained outcomes in the present study, we concluded that the lithotripsy technique by shock wave was effective and vital procedure for management of kidney stones.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Urinary Tract Infection Caused by *Escherichia Coli* and its Resistance to Antibiotics in Pregnant Women

Akmam Ali Habeeb

*Department of Biological Sciences, College of Sciences, Wasit University, Kut, Iraq*

ABSTRACT

**Background:** The infections that affect urinary tracts and caused by pathogenic bacteria are called urinary tract infection (UTI). It has been mentioned that the infection rate of UTI is increased in women due to their sex-based changes and revealed that UTI rate increases in women with type 2 diabetes, because of hormonal alterations during pregnancy. In addition, having multiple-deliveries in women increases the rate of UTI in these women. Current study was aimed to diagnose urinary tract infections (UTI) in women in Al-Kut City, Iraq.

**Method:** From Al-Zahra’a General Teaching Hospital, 60 samples of urine were collected from 60 pregnant and 20 non-pregnant women with and without UTI symptoms, respectively. There were also 15 samples of urine that were collected from women which suffered type 2 diabetes. The investigational study was continued from April, 2016 to April, 2017. Microscopic, cultivation, and biochemical tools were used.

**Results:** the isolated bacteria were from 5 species; *Escherichia coli*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, *Proteus mirabilis*, and *Streptococcus agalactiae*. Using biostatistics, there were no significant differences ($P>0.05$) between pregnant and non-pregnant women regarding the isolated bacterial species. To measure the effect of age on prevalence of the infection, the current study result didn’t show any significant effect of this factor on this rate. However, it showed significant influence of sex factor on the incidence of the infection. In fact, the present study infection rate, 47.5%, occurred mostly in ages of women between 26 to 35 years. The present study also detected that the anatomical specification and the many deliveries of some women played important roles in increasing the rate of UTI. The resulted isolates showed various rates of resistance against antibiotics that ranged from the highest (55.8%) in *Proteus mirabilis* to the lowest (13%) in *Streptococcus agalactiae*. For the antibiotics, the highest resistance rate was against tetracycline (62%), while the lowest rate was against gentamycin (10%).

**Conclusion:** there are many bacteria especially *E. coli* that cause UTI in pregnant women. Current study results suggested launching future studies and following scientific approaches on better control and use of antibiotics against UTI in women.

**Keywords:** UTI, pregnant, non-pregnant, diabetic women, antibiotics resistance.

Introduction

The infections that affect urinary tracts and caused by pathogenic bacteria are called urinary tract infection (UTI). The condition is considered as a common problem that affects women of 20 to 50 years old (1). The inflammation that happens in this condition causes a painful process and risky situation that could affect kidneys if the treatment is not taken into consideration. Pregnant women are most affected by this condition, so as the uterus gets bigger and bigger at 6 weeks of pregnancy, it increases the pressure on the urinary bladder which leaves it always filled with urine and is not completely emptied when urinate. This also increases dampness in these affected parts which leads to increase the growth of pathogenic bacteria (2). It has been mentioned that the infection rate of UTI is increased in women due to their
sex-based changes and revealed that UTI rate increases in women with type 2 diabetes, because of hormonal alterations during pregnancy. In addition, having multiple-deliveries in women increases the rate of UTI in these women (3). UTIs are wide-spread problems in women, so this study was initiated to understand the causative agents inducing these infections.

**Materials and Method**

**Sample Collection:** Current study was aimed to diagnose UTIs (UTI) in women in Al-Kut City, Iraq. From Al-Zahra’a General Teaching Hospital, 60 samples of urine were collected from 60 pregnant and 20 non-pregnant women with and without UTI symptoms, respectively. There were also 15 samples of urine that were collected from women which suffered type 2 diabetes. The investigational study was continued from April, 2016 to April, 2017. The samples were mid-urine samples.

**Microscopic examination of urine samples:** The samples were placed in tubes and centrifuged at 5000rpm for 15min. The supernatant was discarded, while the precipitant was homogenized. A drop from that precipitant was placed on a clean glass slide and covered with a cover slide to visualize pus cells under a microscope using 400x of zooming power (3).

**The bacteriological and the antibiotic sensitivity tests:** Bacteriological examination of the urine was performed as it was shown in Table (1).

<table>
<thead>
<tr>
<th>Age</th>
<th>Group 1*</th>
<th>Group 2 **</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>16-25</td>
<td>20</td>
<td>37.5</td>
</tr>
<tr>
<td>26-35</td>
<td>22</td>
<td>47.5</td>
</tr>
<tr>
<td>36-45</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of gestation</th>
<th>Group 1*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>1-3</td>
<td>20</td>
</tr>
<tr>
<td>4-6</td>
<td>18</td>
</tr>
<tr>
<td>7-9</td>
<td>22</td>
</tr>
<tr>
<td>total</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bacterial isolates</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>E. coli</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Staphylococcus</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>Strepto-coccus</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>3</td>
<td>7.4</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-squared ($X^2$) = 5.080
Results and Discussion

Age effect and the UTI: Current study results showed no significant differences ($p>0.05$) between both groups. The results also revealed that there were no significant ($p>0.05$) effect of age on infection rate in the tested women. The results indicated that the infection rate (47.5%) increased in the ages between 26-35 years. Moreover, ages of 16-25 years showed an infection rate of 37.5%. These results agreed with most studies around the world when it has been found that UTI is a common infection in school girls in a rate of 4%. It has been also discovered that the rate of infection reached 5% in various ages especially in teenage girls. Diabetes and pregnancy increased the rate of UTI in women (4).

Relationship between UTI rate and number of deliveries: The infection rate was highest in women with 1 to 3 deliveries. This rate was shown in 20 (50%) of the collected samples. There was a rate of 45% in 18 samples for women that had (4-6) deliveries in their life before the sampling time. These results agreed with (4) who mentioned that the rate of UTI increased in women due to their sex-based changes and revealed that UTI rate increased in women with type 2 diabetes, because of the hormonal alterations during pregnancy. Having multiple deliveries in women increased the rate of UTI in these women (4).

Bacterial isolates and microscopic analysis of urine samples: For the first group, 40 species of bacteria were isolated that contained 20 (50%) isolates of E. coli, 8 (20%) Klebsiella, 5 (12.5%) Staphylococcus aureus, 4 (10%) Streptococcus and 3 (7.5%) Proteus mirabilis. There were no significant ($p>0.05$) differences between numbers of bacterial isolates from both groups. For the case of urine examination, pus cells were dominant in a range of 7-18 cell/HPF, crystals were 1-17 cell/HPF, different cells were (1-11) cell/HPF and red blood cells were (11-15) cell/HPF. The bacterial presence in the urine was tested under microscope and was measured according to the significant occurrence of 30000/ml (4). Cultivation of 15 urine samples showed insignificant bacterial growth in only 10 samples although most studies suggested bacterial presence in the urine of women who suffer from type 2 diabetes (3). It had been previously suggested that most of the UTIs were induced by bacteria that were present in the UTs of the women with or without diabetes (5).

There was one bacterium that was isolated in the second group which was Proteus mirabilis (10%). For the case of urine general examination, the test showed normal values of crystals, red blood cells, epithelial cells and pus cells (6). The current study revealed that E.coli was the frequent bacterium that was isolated from diabetic pregnant women that had UTI and this agreed with (7) who had found that this bacterium was the most bacterium that caused UTI in women. Klebsiella pneumoniae and Proteus mirabilis have also shown the second highest presence in the affected diabetic-pregnant women with UTIs. The normal location of E. coli is the intestine as this bacterium is a member of normal flora. This bacterium when leaves the intestine, it is transferred to the external urinary tract parts in women and causes UTI. The infection is considered higher in females than males, but the reasons behind this phenomenon are not well known. The occurrence of infection in females is higher than that in males and the reasons behind that could be shorter (3cm) urethra in females than that (15cm) in males. The close urethral opening in females to the vagina entrance might also play a role in increasing UTI rate in females. The personal hygiene after mating, injuries after deliveries, injuries to the hymen membrane, proper way of cleaning after defeation and imprisonment of urine after mating might also place impact on getting UTI in females. Pregnancy encourages the occurrence of UTIs as a result of the presence of hormonal changes, changes in the urine pH and increased glucose in urine of diabetic pregnant women (8).

E. coli secrets hemolysin and this is considered cytotoxic substance which destroys the red blood cells and releases hemoglobin to be used by the bacterium to proliferate. In addition, hemolysin inhibits phagocytosis and chemotaxis processes of white blood cells (9). Moreover, some of the enterobacteriaceae family members have a capsule, characteristic feature that leads to formation of mucoid membranes and prevents phagocytosis. They also have pili that enhance bacterial attachment to epithelial cells (10). Some of these members don’t have pili, but also could attach to these epithelial cells without those pili. This ability of attachment to the epithelial cells helps bacteria evade clearance by urination process. Streptococcus agalactiae (Group B Streptococcus; GBS) was among isolated bacteria in both groups and it is considered as a normal-flora bacterium that is present in the genital tract of females (11). Klebsiella and E.coli caused UTI in diabetic patients (8), but Streptococcus Group B and Enterococci induced UTI in pregnant women at (10-30%). These bacteria...
may lead to premature labor or abortion in women (9). *Staphylococcus aureus* was the second frequent bacterial isolate from infected women and increasing numbers of studies indicated that *Staphylococcus aureus* caused UTI in women. This bacterium has various virulent factors such as capsule forming and hemolysin and protease secretions. These make the bacterium strong enough to induce UTI in people and more specifically women (12). *Proteus mirabilis* and *E. coli* were found to be the most bacterial species that had been isolated in previous studies. The results also revealed that tetracycline gave the highest resistance (67%), while gentamicin was the lowest (10%) in all isolates. Many studies revealed that bacteria that cause UTI infections usually resist many antibiotics. This might be related to the fact that most of the recognized genera carry resistance factors on their DNA and they transfer this ability to the next generations. In addition, excessive intake of antibiotics led to initiation of what is known as superbacteria that can resist most antibiotics. Ampicillin is one of the antibiotics that were used safely for mothers and newborns till recently when it started to give resistance. Piperacillin and tetracycline were the highest antibiotics that gave resistance in this study compared to erythromycin and amikacin. In addition, *proteus mirabilis* bacteria gave the highest resistance to all antibiotics in this study comparing to the others.

In conclusion, there are many bacteria especially *E. coli* that cause UTI in pregnant women. Current study results suggested launching future studies and following scientific approaches on better control and use of antibiotics against UTI in women.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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**REFERENCES**


Hallucinations in Chronic Mental Illness–A Clinical Study of Iraqi Patients

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ABSTRACT

Background: Hallucination as a sensory perception without external stimulation of the relevant sensory organ. Hallucinations in schizophrenia are neither mental image nor true perception. Chronic mental illness is residual symptoms beyond 2 years of initial recognition. The aim of current study was to study the frequency of hallucinations of all modalities and to compare Schneider’s first rank hallucinations with other hallucinatory modalities in same group of patients and to compare the results of present work with result from studies done in other cultures.

Method: This is cohort study, each patient was clinically interviewed. The diagnosis was made according to the criteria of DSM-IV-TR through the use of the national institute of mental health diagnosis interview schedule (NIMH-DIS).

Results: The results of this study were compared to others and found to be relatively comparable. The types of Hallucinations experienced by patients were 72(86.15%) of patients had auditory type, 30(43.07%) had visual, the Schneider’s first rank hallucinations were found in 14(21.04%) patients. The other types of hallucination as tactile and olfactory were rare.

Keywords: hallucination, sensory perception, external stimulation, schizophrenia, chronic mental illness, residual symptoms.

Introduction

Chronic severe mental illness is characterized by persistent disabling psychiatric symptoms or by severely impaired function (1). Several events in the 1950s, including the development of antipsychotic medications and new commitment laws, led to dramatic changes (i.e. deinstitutionalization) in the treatment of the severely and persistently mentally ill. The 1960s brought the Community Mental Health Center Program as an alternative to state hospitalization, as well as new federal programs (Supplementary Security Income [SSI], Social Security Disability Insurance [SSDI], Medicaid and Medicare health benefits) (2). The prevalence of mental illness is higher in cities and in lower-class neighborhoods. This is largely due to the drift of chronically ill patients towards urban environments. Roughly, one-third to one-half of homeless persons in the United States suffer from schizophrenia although such estimates remain controversial (3).

Hamilton suggested a definition, it is a false perception that spring into begin in a primary way and are not transpositions or distortions of any genuine perception, and occur simultaneously with and a long-side real perception. He also distinguished hallucination from true perception in that they come from within although the subject reacts to them as if they were true perceptions (4).

Psychopathology of hallucinations: Although the exact cause and pathogenesis of hallucinations are not known, there is a substantial body of knowledge that points toward multiple etiological factors for hallucinatory phenomena.

Psychophysiological approach: The dissociation–disinhibition theory in which the CNS is seen as having three evolutionary levels; cortex, basal ganglia and spinal cord, and when the usual inhibitory influences of the upper most level are impeded, thus leading to the release of middle level activity in the form of hallucinations (5). The perceptual release theory suggested that the brain continually receives sensory stimuli of all sorts from the external and internal environments, then selectively excludes from consciousness the majority of impulses.
that are irrelevant to attentiveness or otherwise not needed for environmental adaptation. If the sensory input is disturbed or absent, as in the case of excessive.

The proposed a sensory-motor ratio theory focusing on disequilibrium between the internal and the external sensory inputs to the CNS leading to increased sensory awareness and decreased motor responsiveness. They proposed a theory of abnormal brain excitability as a mechanism for the production of hallucinations, they demonstrated that electrical stimulation of certain cortical and subcortical structures may induce different types of hallucinations. They supported the theory of hyper excitation of the CNS indicated that abnormal excitation of brain tissue and abnormal regulation of cognitive activity in left frontal lobe may contribute to hallucinations. By using a C.T. scan technique they found that a lateralization phenomenon of complex auditory hallucinations could be considered a significant clinical sign indicating the existence of a in the superior temporal gurus opposite the hallucination side.

By using a PET scan with fluorodeoxyglucose in chronic schizophrenic patients, it was found that metabolism in Boc's region and its right hemisphere homologue correlated positively and significantly with hallucinations, as it did in anterior cingulate and left superior temporal areas. The traced skin conductance in schizophrenic patients during periods of auditory hallucinations and found a substantial rise in the spontaneous fluctuation rate of skin conductance.

Psychobiochemical approach: Dopamine was believed to play a major role in those phenomena. It is also known that drugs which block central dopamine activity (antipsychotics) may alleviate the hallucinations. Further evidence was that D amphetamine, an indirect dopamine agonist, induces psychosis and hallucinations. Serotonin has also been considered in the biochemistry of hallucinations-it was believed that low central levels (brain stem) of serotonin might be an important factor that a number of hallucinogenic drugs such as lysergide (LSD), mescaline and amphetamine appear to act at least in part by blocking central serotonergic receptors. Furthermore, LSD causes a decrease in the rate of brain serotonin turnover and it is itself structurally similar to serotonin.

Psychodynamic approach: The interpretation of dreams felt that hallucinations are very similar to dreams and that both conditions represent psychotic states in which there is a complete lack of time sense, with the transformation of thoughts into images, mainly of a visual sort. Hallucinations may also be experienced in response to wish fulfillment. Modern psychodynamic views presented by object relations theorists offer another understanding suggested that hallucinations are the results of projective identification, with the violent expulsion and projection of what he termed bizzare objects.

Hallucination in chronic mental illness: Auditory hallucinations are the most frequent type usually formed and complex the voices may be heard as from outside or inside the head and schizophrenic patients of both sexes can hear both male and female voices. The auditory hallucinations in a clear sensorium are characteristic of schizophrenia - even pathognomonic stated that three types of hallucinations are diagnostic of schizophrenia; audible thoughts, voices conversing about the patient in the third person and voices in the form of running commentary.

Visual hallucinations: Have been described in many ways, either as common phenomena in schizophrenia or less frequent or even rare but not entirely unknown. Visual hallucinations in psychotic disorders appear suddenly, do not change if the eyes are closed or open. In schizophrenia are continuous except when asleep accompanied by other sensory disturbances, frightening, three dimensional, normal in size, bright in color and appear to be moving. The visual hallucinations in schizophrenia were less colored, complex and moving.

Tactile hallucinations: They occur principally in toxic states. It took place either in the form of abnormal perception under the skin (formication) - or in the form of electrical and sexual feeling in the body which occur more in schizophrenia. Bodily senses as touch or heat have been described as simple hallucination - while feelings of pain, electricity or sexual excitement which are attributed to external agency have been described as passivity experiences.

Coenaesthetic hallucinations: are peculiar visceral sensations not perceived under appropriate physiological conditions as burning sensation in the brain, blood flowing inside the blood vessels.

Kinesthetic hallucinations: are perceptions of body movement or part of it that are not actually moving. The African schizophrenics with somatic hallucination ascribed their experiences to witches, poisonous objects and insects that are being thrown at them.
Olfactory hallucinations: usually infrequent in schizophrenia or described as not uncommon in schizophrenia with lesion of temporal lobe and of bad character.

Gustatory hallucination: an uncommon type- of unpleasant nature - and usually accompanied by olfactory hallucination. It appeared to predict outcome in schizophrenia (more in the acute type) \(^{(21)}\).

Aim of the study

The purpose of this research was to study the frequency and types of hallucinations of all modalities in a group of Iraqi patients with chronic mental illness and compare Schneider’s first rank hallucinations with others in the same group of patients. Also, to compare the present results with those from studies done in other cultures.

Patients and Method

A Cohort composed of (300) patients suffering from chronic schizophrenia diagnosed by more than one consultant psychiatrist throughout their entire admissions. The study was carried out during the period from 1\(^{st}\), January 2014 to 1\(^{st}\), January 2016. Forty one patients (33 males and 8 females) were excluded from the study because of severe speech retardation - severe formal thought disorder impaired cognitive functions and language barrier. The rest 193 patients, 128 patients had only negative symptoms (85 males and 43 females) and 65 patients (33.6 %) had positive symptoms of hallucinations and delusions. It was composed of 33 males (50.76 %) and 32 females (49.23 %). The diagnosis was made according to the criteria of DSM- IV-TR through the use of national institute of mental health diagnostic interview schedule (NIMH-DIS) questions specific for the diagnosis of schizophrenia \(^{(21)}\).

Descriptive Statistics were used in the analysis of data which included frequency, mean, range and standard deviation, z-test and chi-squared test. Level of significance was tested at \(P\leq 0.05\).

Results

The point prevalence of hallucinations in the whole sample (65 patients) was 33.6%. Table (1) showed types of hallucinations experienced by the patients. Forty eight patients (86.15%) had auditory type, 11(43.07%) visual, 4(9.23%) had tactile and 2(3.07%) had olfactory type. Table (2) explained that the frequency of both pure auditory hallucinations and mixed ones was nearly equal in the sample (Table 2). In the present study visual, tactile and olfactory hallucinations were associated with auditory type. On the other hand, Table (3) clarified the content of both types of auditory hallucinations. Table (4) presented visual hallucinations experienced by 11 patient (43.07%) and their contents are demonstrated. Table (5) showed the frequency of tactile hallucinations and their contents, pain was the most prominent one. Moreover, Table (6) revealed that out of 65 patients with hallucinations, 34 patients (50.76%) had expressed delusional experiences.

Discussion

The male: female ratio in this study was almost equal (33: 32). This is probably due to the influence of strict criteria used in patients selection (chronic schizophrenics, with active symptoms of hallucination and delusions). In the original sample of 300 patients, males were found to be more than females (151: 83).

The mean age of males was 45.6 years, while that for females was 37.7 years. In this sample, 48(86.15 %) patients had auditory hallucinations, 11(43.07 %) patients had visual type, 4(9.23 %) patients had tactile type and 2(3.07 %) patients had olfactory type (Table 1).

Data from current study showed that auditory hallucinations were the most frequent types in the present, whereas visual and other types were relatively high.

The frequency of both pure auditory hallucinations and mixed ones was nearly equal in current sample (Table 2). In the present study, visual, tactile and olfactory hallucinations were associated with auditory type.

Olfactory hallucinations were too few (4 patients) in the present study probably due to a relatively small sample size. The point prevalence of associated delusions in the present study was 50.76% with a male: female ratio (10: 23; Tables 3-6).

Conclusion

Several types of hallucinations were found to occur in chronic mental illness. They may involve more than one sensory modality. The Schneider’s first rank hallucinations and delusions seemed to occur less
frequently in chronic schizophrenia and probably of little diagnostic significance. Visual hallucinations seemed to occur in sufficient numbers and are considered relatively specific to the syndrome of schizophrenia.

Table 1: Types of hallucinations among the chronic mental illness

<table>
<thead>
<tr>
<th>Types</th>
<th>No.</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory</td>
<td>48</td>
<td>86.15</td>
<td>32</td>
<td>24</td>
</tr>
<tr>
<td>Visual</td>
<td>11</td>
<td>43.07</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Tactile</td>
<td>4</td>
<td>9.23</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Olfactory</td>
<td>2</td>
<td>3.07</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gustatory</td>
<td></td>
<td></td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

$X^2=18.67, P=0.001$

Table 2: Comparison of types of hallucination in this study

<table>
<thead>
<tr>
<th>Types</th>
<th>No.</th>
<th>Z-test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory hallucination</td>
<td>48</td>
<td>$Z$-test = 3.37</td>
<td>0.0007</td>
</tr>
<tr>
<td>Visual hallucination</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditory hallucination</td>
<td>60</td>
<td>$Z$-test = 6.82</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Tactile hallucination</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditory hallucination</td>
<td>60</td>
<td>$Z$-test = 7.57</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Olfactory hallucination</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual hallucination</td>
<td>30</td>
<td>$Z$-test = 3.918</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Tactile hallucination</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditory hallucination</td>
<td>30</td>
<td>$Z$-test = 4.91</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Olfactory hallucination</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tactile hallucination</td>
<td>8</td>
<td>$Z$-test = 1.426</td>
<td>0.153</td>
</tr>
<tr>
<td>Olfactory hallucination</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Contents of auditory hallucinations unrelated to Schneider's F.R.S (n:44)

<table>
<thead>
<tr>
<th>Content</th>
<th>No.</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abusive</td>
<td>22</td>
<td>43.18</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Noises</td>
<td>11</td>
<td>22.72</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Protective</td>
<td>9</td>
<td>18.18</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Command</td>
<td>7</td>
<td>15.90</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>100</td>
<td>24</td>
<td>29</td>
</tr>
</tbody>
</table>

$X^2=0.0233, P=0.9$

Table 4: Contents of Visual hallucinations (n:30)

<table>
<thead>
<tr>
<th>Content</th>
<th>No.</th>
<th>%</th>
<th>Male %</th>
<th>Female %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td>4</td>
<td>39.28</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Terrifying</td>
<td>3</td>
<td>32.14</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Angels</td>
<td>2</td>
<td>14.28</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Animals</td>
<td>1</td>
<td>7.14</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Light</td>
<td>1</td>
<td>7.14</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>100</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

$X^2=13.901, P=0.01.$
### Table 5: Contents of tactile hallucinations (n: 6)

<table>
<thead>
<tr>
<th>Contents</th>
<th>No.</th>
<th>%</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>2</td>
<td>66.66</td>
<td>1</td>
<td>66.66</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Sexual</td>
<td>1</td>
<td>16.66</td>
<td>1</td>
<td>16.66</td>
<td>0</td>
<td>----</td>
</tr>
<tr>
<td>Coenesthetic</td>
<td>1</td>
<td>16.66</td>
<td>0</td>
<td>16.66</td>
<td>0</td>
<td>----</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8</td>
<td>100</td>
<td>2</td>
<td>50</td>
<td>2</td>
<td>50</td>
</tr>
</tbody>
</table>

z- test =1.3, P= 0.01.

### Table 6: Point prevalence of delusion in the study sample (n : 65)

<table>
<thead>
<tr>
<th>Delusion</th>
<th>No.</th>
<th>%</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33</td>
<td>50.76</td>
<td>10</td>
<td>15.38</td>
<td>23</td>
<td>35.38</td>
</tr>
</tbody>
</table>

z- test = 0, P= 0.04.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

**REFERENCES**


Bolton’s Ratios in Normal, Spaced and Crowded Dental Arches (Iraqi Study)

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ABSTRACT

Background: Determination of mesio-distal width of human teeth is very important due to its relation to many dental fields like aesthetic dentistry, orthodontics, anthropometrics, prosthodontics, studying the differences between ethnic groups and in gender determination in forensic dentistry. So that Bolton developed an analysis to assist in establishing the discrepancy between the mesio-distal widths of the maxillary and mandibular teeth. This study was aimed to determine and compare the anterior and overall Bolton’s ratios in normal, crowded and spaced dentitions.

Method: One hundred fifty pair of dental casts belonged to 150 Iraqi individuals having class I dental relationship with normal, crowded and spaced dentition after analyzing the space in both dental arches. The mesio-distal crown widths of the maxillary and mandibular permanent teeth anterior to the second molars were measured using electronic digital vernier with 0.01mm accuracy to calculate Bolton’s ratios. Unpaired t-test, one-way ANOVA and post hoc Tukey’s test were used to compare the measured parameters.

Results: The combined mesio-distal crown widths were significantly higher in crowded dentition followed by normal then spaced dentition. Bolton’s ratios neither showed significant gender and group differences nor followed the same pattern of the combined mesio-distal crown widths.

Conclusions: The difference in Bolton’s ratios was related to the difference in the mesio-distal widths and dental arch discrepancy that must be addressed in details.

Keywords: Bolton’s ratio, crowding, spacing, tooth size discrepancy, mesio-distal crown width.

Introduction

Determination of mesio-distal width of human teeth is very important due to its relation to many dental fields like aesthetic dentistry, orthodontics, anthropometrics, prosthodontics, studying the differences between ethnic groups and in gender determination in forensic dentistry.(1)

The decision of removing enamel (dental stripping) or teeth (dental extraction) from the dental arches must not be done in an arbitrary manner, because the final results of successful orthodontic therapy comprised of achieving ideal interdigitation, overjet, overbite and alignment of teeth. In order to get such an optimum interarch dental relationship, the maxillary tooth materials should have a reasonable ratio with the mandibular tooth materials. So that, Bolton (2,3) developed an analysis to assist in establishing the discrepancy between the mesio-distal widths of the maxillary and mandibular teeth. This analysis consisted of two ratios; the anterior ratio obtained from dividing the collective mesio-distal widths of mandibular anterior teeth from canine to canine by their opposing and the overall ratio gained by dividing the collective mesio-distal widths of mandibular teeth from first molar to its antimere by their antagonists.

Teeth erupted in the oral cavity either in well-aligned state, crowded or spaced. The causes of the two latter problems were related to the discrepancy in the size of the jaw and teeth or may be related to different local factors (4).
A number of previous studies (5-8) concluded that a difference in the mesio-distal widths among normal, spaced and crowded dental arches did exist.

In Iraq, several studies had been conducted to establish the Bolton’s ratio in crowded dental arches with class I dental relation (9), class II division 1 with crowding and spacing (10), spaced dental arches with class I dental relation (11), in Down’s syndrome patients (12), in different malocclusion cases (13) and in different ethnic groups (14,15). On the other hand, (16) determined the real site of anterior tooth size discrepancy in different anterior Bolton’s ratio.

To the best of authors’ knowledge, there was no study compared the anterior and overall Bolton’s ratios among normal, crowded and spaced dentitions; therefore, the aim of current study as to determine and compare the anterior and overall Bolton’s ratios in normal, crowded and spaced dentitions.

**Materials and Method**

**Sample:** The sample of current study comprised of 150 pairs of dental casts belonged to patients attended the Department of Orthodontics at the College of Dentistry/University of Baghdad and students from the same college. They were selected according to the following criteria:

1. All individuals were Iraqi Arabs in origin within an age range of (18-25) years.
2. All had sound, fully erupted permanent dentition with Angle’s class I dental relationship.
3. No one had undergone orthodontic treatment.
4. Bimaxillary protrusion cases were excluded.
5. No periodontal problems like gingivitis or periodontitis.
6. No history of bad oral habits or congenital deformities like cleft lip and palate.

**Method**

Following clinical examination to check the fulfillment of the inclusion criteria, maxillary and mandibular dental impressions were taken using Alginate hydrocolloid impression material (Tropicalgin, Chromatic alginate, Zhermack, Italy), rinsed with running water, disinfected with sodium hypochlorite (1:10) and stored in closed plastic bag for ten minutes (17). Then after, the impressions were rinsed again and poured with dental stone (Elite Rock, Sandy brown, Zhermack, Italy) and just before the final setting of the dental stone, a base was prepared using plastic mold and plaster (Plaster of Paris, Al-Ahleea Co., Iraq). The base was labeled for participant’s name and number to be ready for the measuring procedure.

To classify the sample in current study, the arch length was measured by dividing the dental arch into four segments. The posterior segments were measured mesial to the first molars to the contact between the canines and the first premolars from the right and left sides. The anterior segments were measured from the distal contact point of the canines to the mesial contact point of the central incisors from the right and left sides (18). The mesio-distal width of all teeth anterior to the first molars was measured using electronic digital caliper (S.H®, China) with 0.01mm accuracy. Space was then analyzed using the following equation: Space analysis = (Arch length - Teeth width)

Any arch with negative three millimeters or more was assigned as crowded arch, whereas any arch whose space analysis revealed positive three millimeters or more was allocated as spaced arch, on the other hand, 0 ± 3mm regarded as normal.

As a final point, the samples were divided into three groups (5):

1. **1st group:** normal (well-aligned) dentition comprised of fifty pairs of study models belonged to 23 males and 27 females with equal and less than 3mm crowding or spacing per arch.
2. **2nd group:** crowded dentition composed of fifty pairs of study models belonged to 23 males and 27 females with more than 3mm crowding per arch.
3. **3rd group:** spaced dentition consisted of fifty pairs of study models belonged to 21 males and 29 females with more than 3mm spacing per arch.

The anterior and overall Bolton’s ratios were calculated according to the following equations (2,3):

Anterior ratio = (sum of mandibular 6 anterior teeth/ sum of maxillary 6 anterior teeth) × 100.
Overall ratio = (sum of mandibular 12 teeth/sum of maxillary 12 teeth) × 100.

The posterior teeth including both premolars and first molars were summed and posterior ratio was calculated according to the following equation:

Posterior ratio = (sum of mandibular 6 posterior teeth/sum of maxillary 6 posterior teeth) × 100.

Statistical Analyses: Data were analyzed using SPSS version 24 (IBM Co., New York, USA). The statistical analyses included means and standard deviations as descriptive statistics and independent sample t-test, one-way ANOVA test followed by Tukey’s test as inferential statistics. P-value was set at 0.05.

Results

Descriptive statistics and groups’ differences of the combined mesio-distal widths of teeth from canine to canine, first molar to first molar and from first premolar to first molars in the other side in both arches and different groups were demonstrated in Table (1). Generally, crowded arches possessed wider teeth followed by normal then spaced dentition with statistically significant differences among the groups as indicated by ANOVA and Tukey’s test.

| Table 1: Descriptive statistics and comparison of the combined mesio-distal width of maxillary and mandibular teeth among different groups |
|-----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Teeth based on FDI | Descriptive statistics | Comparison | | | | |
| | Normal (N) | Crowded (C) | Spaced (S) | ANOVA test | Tukey’s HSD test |
| | Mean | S.D. | Mean | S.D. | Mean | S.D. | F-test | p-value | N-C | N-S | C-S |
| 13-23 | 46.641 | 2.346 | 48.027 | 2.955 | 43.587 | 2.359 | 39.095 | 0.000 | 0.021 | 0.000 | 0.000 |
| 43-33 | 36.346 | 1.881 | 37.564 | 2.013 | 34.837 | 1.972 | 24.389 | 0.000 | 0.006 | 0.000 | 0.000 |
| 16-26 | 93.812 | 3.949 | 97.011 | 4.661 | 90.281 | 3.983 | 31.953 | 0.000 | 0.001 | 0.000 | 0.000 |
| 46-36 | 86.265 | 4.256 | 89.208 | 4.299 | 83.516 | 3.587 | 24.574 | 0.000 | 0.001 | 0.000 | 0.000 |
| (14-16)+(24-26) | 47.172 | 2.022 | 48.983 | 2.142 | 46.694 | 2.190 | 16.239 | 0.000 | 0.000 | 0.499 | 0.000 |
| (44-46)+(34-36) | 49.919 | 2.816 | 51.644 | 2.809 | 48.679 | 2.133 | 16.326 | 0.000 | 0.003 | 0.049 | 0.000 |

Descriptive statistics and gender differences of Bolton’s ratios were demonstrated in Table (2) and results indicated non-significant gender differences.

| Table 2: Descriptive statistics and gender differences of Bolton’s ratios in different dentitions |
|-----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Dentition | Ratios | Descriptive statistics | Comparison | | |
| | | Males | Females | | |
| | Mean | S.D. | Mean | S.D. | t-test | p-value |
| Normal | Anterior ratio | 77.399 | 2.324 | 78.473 | 3.368 | -1.289 | 0.204 |
| | Overall ratio | 92.132 | 2.380 | 91.814 | 2.710 | 0.437 | 0.664 |
| | Posterior ratio | 106.903 | 4.145 | 104.924 | 4.095 | 1.694 | 0.097 |
| Crowded | Anterior ratio | 78.180 | 4.830 | 78.517 | 3.736 | -0.278 | 0.782 |
| | Overall ratio | 91.681 | 4.134 | 92.340 | 3.717 | -0.594 | 0.556 |
| | Posterior ratio | 104.937 | 4.534 | 105.959 | 5.261 | -0.729 | 0.470 |
| Spaced | Anterior ratio | 79.310 | 2.652 | 80.482 | 3.977 | -1.173 | 0.247 |
| | Overall ratio | 92.227 | 2.559 | 92.772 | 2.434 | -0.765 | 0.448 |
| | Posterior ratio | 104.357 | 3.995 | 104.306 | 3.457 | 0.049 | 0.961 |

Group differences of Bolton’s ratios were summarized in Table (3). As it is clear in Table (2), there was no significant gender differences in all ratios and in all groups, so both genders were summed as one sample in each group for statistical purposes. The results showed that the anterior Bolton’s ratio differed significantly among the groups
being higher in spaced dentition followed by the crowded then normal dentitions. Furthermore, post hoc Tukey’s test revealed a significant difference between the normal and spaced dentition and non-significant differences between normal and crowded and between spaced and crowded dentitions. On the other hand, the overall and posterior ratios showed non-significant groups’ differences. Overall ratio was higher in spaced dentition followed by crowded then normal ones and just the reverse for the posterior ratio.

Table 3: Descriptive statistics and comparison of Bolton’s ratios among different groups

<table>
<thead>
<tr>
<th>Ratios</th>
<th>Descriptive statistics</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (N)</td>
<td>Crowded (C)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Anterior ratio</td>
<td>77.979</td>
<td>2.955</td>
</tr>
<tr>
<td>Overall ratio</td>
<td>91.960</td>
<td>2.542</td>
</tr>
<tr>
<td>Posterior ratio</td>
<td>105.834</td>
<td>4.196</td>
</tr>
</tbody>
</table>

**Discussion**

In the present study, the sample was selected with an age ranged from 18 to 25 years. This range was considered the best age range for assessing teeth size discrepancy and measurement, because by the age of 16-17 years the majority of facial growth is nearly completed and above 25 years old the effect of aging like attrition may act as a factor that may affect teeth size discrepancy and measurement.

Current study revealed significantly smaller sum mesio-distal crown widths from canine to canine, first molar to first molar and from first premolar to first molars confirming findings from previous studies (6,8).

Bolton’s ratios, in addition to posterior ratio, did not show any significant gender differences in all groups (Table 2). Othman and Harradine (21) reported, in their review about Bolton’s ratios, that most studies found no significant gender difference and if found in some studies, it was small with males having slightly larger ratio.

The mean value of anterior Bolton’s ratio was higher in spaced dentition followed by crowded then normal ones with significant group differences. The overall Bolton’s ratio followed the same pattern, but with non-significant group differences. In comparison with other Iraqi studies, both ratios were less than those reported by (13) and near to that of (13) for normal occlusion only.

This is the first study that dealt with the Bolton’s ratios in normal, crowded and spaced dentitions and there was no study that discussed this issue as a whole. The findings of the Bolton’s ratios in current study may not follow the same order of that obtained for the combined mesio-distal crown widths, that’s to say, the ratios were not high in crowded dentition and small in spaced dentition with the normal dentition in between. This difference can be explained from many aspects. First; the cause of spacing or crowding was not determined; Is it due to small teeth with normal jaws or normal teeth with large jaws? or small teeth with large jaws? (The opposite is for the crowding). Second; a difference in mesio-distal widths between the upper and lower teeth might exist (22). Third; the difference in the inclination of incisors to get class I relation among the studied groups had not been studied because it needs lateral cephalometric X-ray (23). Fourth; the degree of crowding and spacing itself is not limited, because the cut-point of sample selection for the present study was more than 3mm for spacing and more than -3mm for crowding without determining the limit except for the normal dentition (0 ± 3mm).

In the literature, there was only one study compared Bolton’s ratios between the crowding and spacing class II division 1 dentition and the results indicated that the overall ratio was higher in crowded dentition, while the anterior ratio was slightly higher in spaced group with non-significant group differences (10). The latter study lacked a control group (normal dentition). On the other hand, (24) found that Bolton’s ratios and the collective mesio-distal widths of anterior teeth and overall teeth were higher in crowded dentition in comparison with non-crowded one. This supported the findings of the present study.

The posterior ratio was used to detect its effect on the overall Bolton’s ratio. Its mean value was near to that
reported by (19), but it did not differ among the studied groups although the collective mesio-distal widths of posterior teeth were significantly differed, being higher in crowded dentition followed by normal and spaced dentitions.

**Conclusion**

The findings of the present study revealed that there were non-significant gender differences in Bolton’s ratios. For the total sample in each group, the combined mesio-distal crown widths of maxillary and mandibular permanent teeth anterior to second molars were significantly wider in crowded dentition followed by normal and the least in spaced dentition. On the other hand, anterior, posterior and overall ratios did not follow the same order.

Further study is suggested to establish the normal range of Bolton’s ratios in crowding and spacing according to their severity.

**Ethical Clearance:** The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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**REFERENCES**


Correlation between Glycemic Control and Diabetes Self-Care in Patients with Type 1 Diabetes on Insulin Regimens (Basal-bolus vs. Biphasic premixed)

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ABSTRACT

Background: Self-care is probably decisive factor to control blood glucose level to establish euglycemia in diabetes. 3.7 million deaths in 2016 were due to diabetes and hyperglycemia.

Objectives: To assess correlation between diabetes self-care reflected by Diabetes Self-Management Questionnaire (DSMQ) scores and glycemic control by Hemoglobin A1c (HbA1c) in patients with type 1 diabetes and to stratify them according to the prescribed insulin regimen (basal-bolus vs. twice-daily premixed regimen) for further comparison.

Method: 100 patients with type 1 diabetes were cross-sectionally assessed using DSMQ in interview-sessions at Kerbala Educational Children Hospital-Endocrinopathy outpatient clinic and at a private clinic. Demographic data, recent records of HbA1c and Self-Monitored Blood glucose (SMBG), and other self-care variables were obtained. SPSS was used to assess correlations and to compare group characteristics.

Results: Correlations between HbA1c and DSMQ-subcales revealed non-significant correlations for Sum scale (SS), Glucose management (GM), Physical activity (PA), and Health-care use (HU) [Spearman’s ρ=.017; .080; .095 and -.054 respectively], however there was a significant correlation with Dietary control (DC) subscale [Pearson’s r=-.209; p-value=.037]. Premixed versus basal-bolus comparisons showed significant differences in mean HbA1c (± SD) 10.82% ± 2.33 vs. 9.28% ± 2.19; p-value=.002 and mean DSMQ-subcales scores except DC-subscale. There were non-significant differences regarding random SMBG, BMI, and score of DSMQ-DC subscale.

Conclusion: Non-significant relation between glycemic control and self-care except dietary control which was negative. Basal-bolus regimen was superior in long-term glycemic control despite lower self-care compared with premixed regimen.

Keywords: Diabetes self-care, Diabetes Self-Management Questionnaire, Glycemic control, HbA1c, Insulin regimens

Introduction

Diabetes is a metabolic group of diseases in which hyperglycemia occurs due to defective insulin secretion and/or insulin action¹.

About 425 million people, worldwide, were estimated to have diabetes. Some more than 96,000 children and adolescents under 15 years were estimated to have type 1 diabetes annually².

Type 1 diabetes is thought to be precipitated by immune-mediated destruction of pancreatic β cells³. A hallmark of type 1 diabetes is the need for exogenous insulin replacement. To enable patients to achieve near-euglycemia, insulin analogues have been developed. Short-acting preparations (to improve post-prandial control) and long-acting preparations (to reproduce
physiological basal profile), or premixed products (to cover both basal and prandial needs) are offered in a multiple daily injection (4)(5)(6).

HbA1c is a hemoglobin formed by a non-enzymatic glycation reactions between glucose and hemoglobin β-chain. HbA1c has been endorsed by American Diabetes Association, National Institute for Health and Care Excellence and World Health Organization for confirming the diagnosis of diabetes mellitus and also used as an indicator of glycemic control (6)(7)(8).

Schmitt et al. developed a psychometric tool in a “Diabetes Self-Management Questionnaire” to target diabetes self-care behaviors associated with metabolic control within common treatment regimens (9). The questionnaire has shown a reliable instrument that maybe useful for research associations between self-management and glycemic control (10)(11)(12). The purpose of this study is to assess correlation of glycemic control with diabetes self-care in patients with type 1 diabetes on basal-bolus insulin regimen compared with twice-daily premixed regimen.

Method

Study Design and Participants: A cross-sectional study was conducted at Kerbala Educational Children Hospital®-Endocrinopathies outpatient clinic and at private clinic at Kerbala from 24th of July 2017 to 26th of March 2018.

Inclusion criteria were type 1 diabetes patients at childhood to late adulthood age groups who were receiving insulin by a basal-bolus regimen (group 1) or a twice-daily premixed regimen (group 2). Whereas exclusion criteria involved any patient with other type of diabetes (i.e.: gestational, type 2, or adults on insulin pumps).

Additionally, demographic data were gained from patient interview or hospital records including gender, age, Body Mass Index, diabetes duration, complications status, recent SMBG, and recent HbA1c. The interview consumed 15-30 minutes. Furthermore, variables of self-management including diabetes history, glucose monitoring, diet, physical activity, and prescribed medications; were assessed in patients ascertain of their responses for further re-evaluation.

Diabetes Self-Management Questionnaire (DSMQ):
The DSMQ was developed at the Research Institute of the Diabetes Academy (9). The approved form consisted of 16 items identified after analysis of responses. A four-point Likert scale (to avoid a neutral response option and force specific responses), with the response options: ‘applies to me very much’ (3 points), ‘applies to me to a considerable degree’ (2 points), ‘applies to me to some degree’ (1 point), and ‘does not apply to me’ (0 points), was used.

The questionnaire provides a ‘Sum Scale’ (SS) score beside estimation of four subscale scores labelled:

- ‘Glucose Management (GM)’
- ‘Dietary Control (DC)’
- ‘Physical Activity (PA)’
- ‘Health-Care Use (HU)’
- And one item (16) requests an overall rating of self-care to be included in the SS only.

Scale scores were formulated as sums of item scores and then transformed to a scale ranging from 0 to 10.

Glycemic Control: HbA1c values were used as an indicator of glycemic control for the preceding 2-3 months (8). Most recent values were obtained from interview or from hospital records measured according to a laboratory using high-performance liquid chromatography performed with the Bio-Rad D-10™ Turbo analyzer. Recent SMBG readings were also recorded. For those lacking the records, an estimated Mean Plasma Glucose (MPG) was calculated using the DCCT study validated formula based on the linear regression equation (13)(14).

Statistical Analyses: The analyses were performed using SPSS 25.0.0 (IBM SPSS Inc., New York). Group comparisons involved Student’s t-test, Pearson’s chi-squared test and One-way analysis of variance (ANOVA) as well as non-parametric tests. A P-value of < 0.05 (two-tailed test) was considered as criterion of statistical significance. Cronbach’s α was used to assess internal consistency reliability.

Pearson product-moment and Spearman’s rank correlations were used to assess correlations between HbA1c and DSMQ-subscases. Additionally, known groups validity was assessed by assorting the patients
into 3 groups according to the HbA1c value, which were then examined regarding self-care activities of DSMQ-subcales. Patients with HbA1c values up to 7.5% (58 mmol/mol) were classified as ‘good glycemic control’, patients with values between 7.6 and 8.9% (60 and 74 mmol/mol) as ‘medium glycemic control’, and patients with values from 9.0% (75 mmol/mol) as ‘poor glycemic control’. Between-groups differences were analyzed using ANOVA.

### Results

**Samples Characteristics:** The total sample comprised 100 patients with type 1 diabetes of which 53% were females. Mean participant age (±SD) was 12.27 ± 6.78 years and mean duration of diabetes was 5.59 ± 4.54 years.

The characteristics of study sample are detailed in (Table 1).

**Table 1: Study sample characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All patients (N = 100)</th>
<th>PREMIXED (N = 67)</th>
<th>BASAL BOLUS (N = 33)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female gender no. (%)</td>
<td>53 (53%)</td>
<td>38 (56.7%)</td>
<td>15 (45.5%)</td>
<td>.289</td>
</tr>
<tr>
<td>Age (years)</td>
<td>12.27 ± 6.78</td>
<td>11.96 ± 7.03</td>
<td>12.91 ± 6.31</td>
<td>.511 [.492]</td>
</tr>
<tr>
<td>Diabetes duration (years)</td>
<td>5.59 ± 4.54</td>
<td>4.97 ± 4.15</td>
<td>6.82 ± 5.07</td>
<td>.055 [.085]</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>36.81 ± 16.17</td>
<td>35.57 ± 15.63</td>
<td>39.29 ± 17.19</td>
<td>.284 [.447]</td>
</tr>
<tr>
<td>Height (m)</td>
<td>1.37 ± .20</td>
<td>1.35 ± .20</td>
<td>1.41 ± .20</td>
<td>.145 [.208]</td>
</tr>
<tr>
<td>Body Mass Index (Kg/m²)</td>
<td>19.55 ± 4.88</td>
<td>20.06 ± 5.36</td>
<td>18.61 ± 3.74</td>
<td>.185 [.385]</td>
</tr>
<tr>
<td>Random glucose (mg/dL)</td>
<td>251.65 ± 108.84</td>
<td>264.18 ± 116.53</td>
<td>226.22 ± 87.46</td>
<td>.072 [.112]</td>
</tr>
<tr>
<td>HbA1c value (%)(mmol/mol)</td>
<td>10.32 (89) ± 2.39</td>
<td>10.82 (95) ± 2.33</td>
<td>9.28 (78) ± 2.19</td>
<td>[.002]</td>
</tr>
<tr>
<td>With late complication(s)(%)†</td>
<td>46 (46%)</td>
<td>36 (53.7%)</td>
<td>10 (30.3%)</td>
<td>.027</td>
</tr>
<tr>
<td>DSMQ ‘Sum Scale’</td>
<td>6.40 ± 1.37</td>
<td>6.73 ± 1.30</td>
<td>5.74 ± 1.27</td>
<td>[.0004]</td>
</tr>
<tr>
<td>Subscale ‘Glucose Management’</td>
<td>7.86 ± 1.98</td>
<td>8.54 ± 1.50</td>
<td>6.48 ± 2.14</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Subscale ‘Dietary Control’</td>
<td>5.45 ± 2.17</td>
<td>5.42 ± 2.39</td>
<td>5.51 ± 1.67</td>
<td>.842</td>
</tr>
<tr>
<td>Subscale ‘Physical Activity’</td>
<td>4.41 ± 3.44</td>
<td>5.01 ± 3.15</td>
<td>3.20 ± 3.72</td>
<td>[.015]</td>
</tr>
<tr>
<td>Subscale ‘Health-Care Use’</td>
<td>7.41 ± 1.93</td>
<td>7.68 ± 1.89</td>
<td>6.87 ± 1.91</td>
<td>[.049]</td>
</tr>
</tbody>
</table>

Data are n(%) or M ± SD. HbA1c, glycated hemoglobin; DSMQ, Diabetes Self-Management Questionnaire; M, mean; SD, standard deviation. * regards differences between insulin regimens; Student’s t-Test or Pearson’s χ²-Test (two-tailed test). Mann-Whitney U test p-values are presented in square brackets. † Retinopathy, neuropathy, nephropathy, diabetic foot, and/or arterial occlusive disease.

**Distribution Characteristics and Reliability in DSMQ Subscales:** A Shapiro-Wilk test (p < .05) and a visual inspection of their histograms, Q-Q plots and box plots showed that DSMQ subscales: SS, GM, PA and HU were non-normal distributed with skewness of -.611, -.758, .087, and -.813 (SE=.241) respectively; and kurtoses of .113, .202, -1.222, and 1.496 (SE=.478) respectively. DC-subscale was slightly skewed (-.018) and kurtotic (-.620) but it does not differ significantly from normal as Shapiro-Wilk test p-value was > 0.05 (15) (16).

Internal consistency reliability (Cronbach’s α) showed an overall acceptable consistency (.684) and reliabilities within DSMQ-subscals ranged: GM=.672, acceptable; DC=.500, questionable; PA=.917, excellent; and HU=.240, poor.

**DSMQ Subscales with HbA1c Associations:** Correlation of HbA1c and DSMQ-subscals GM, PA, SS, and HU was non-significant. Table 2 displays coefficients of correlations regarding and regardless of insulin regimen been used.
Table 2: Correlations between HbA1c and DSMQ self-care subscales according to insulin regimen

<table>
<thead>
<tr>
<th>DSMQ Subscale</th>
<th>Pearson’s correlation r(p-value)</th>
<th>Spearman’s ρ(p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum scale (SS)</td>
<td>.017 (.869)*</td>
<td>-.088 (.479) †</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.137 (.445) ‡</td>
</tr>
<tr>
<td>Glucose management (GM)</td>
<td></td>
<td>.080 (.431)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.086 (.490) †</td>
</tr>
<tr>
<td>Dietary control (DC)</td>
<td>-.209 (.037)*</td>
<td>-.179 (.147) †</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.330 (.061) ‡</td>
</tr>
<tr>
<td>Physical activity (PA)</td>
<td>.095 (.347)†</td>
<td>-.027 (.830) †</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.052 (.773) ‡</td>
</tr>
<tr>
<td>Health-care use (HU)</td>
<td>-.054 (.597)*</td>
<td>-.113 (.362) †</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.168 (.349) ‡</td>
</tr>
</tbody>
</table>

* Regardless of insulin used; † regards twice-daily premixed regimen; ‡ regards basal bolus regimen. P-values are presented in parenthesis.

The comparison of groups with ‘good’, ‘medium’, and ‘poor’ glycemic control showed non-significant differences for all DSMQ subscale scores (Table 3). However, there were significant differences regarding insulin regimens and age groups but non-significant difference in gender (Table 4).

Table 3: Comparison of the DSMQ self-care activities in patients with HbA1c ≤ 7.5%, from 7.6 to 8.9%, and ≥ 9.0%

<table>
<thead>
<tr>
<th>DSMQ self-care activities</th>
<th>HbA1c ≤ 7.5% (n = 16)</th>
<th>HbA1c 7.6 to 8.9% (n = 16)</th>
<th>HbA1c ≥ 9.0% (n = 68)</th>
<th>ANOVA p-value or [Kruskal-Wallis H asymptotic sig.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum Scale (SS)</td>
<td>6.445 ± .885</td>
<td>6.419 ± 1.007</td>
<td>6.391 ± 1.532</td>
<td>[.828]</td>
</tr>
<tr>
<td>Glucose Management (GM)</td>
<td>7.208 ± 1.673</td>
<td>7.625 ± 2.065</td>
<td>8.069 ± 2.012</td>
<td>[.168]</td>
</tr>
<tr>
<td>Dietary Control (DC)</td>
<td>6.146 ± 2.061</td>
<td>5.990 ± 1.368</td>
<td>5.159 ± 2.300</td>
<td>.145</td>
</tr>
<tr>
<td>Physical Activities (PA)</td>
<td>3.750 ± 3.113</td>
<td>4.028 ± 3.649</td>
<td>4.657 ± 3.478</td>
<td>.598</td>
</tr>
<tr>
<td>Health-care Use (HU)</td>
<td>7.639 ± 1.456</td>
<td>7.569 ± 1.090</td>
<td>7.320 ± 2.174</td>
<td>[.927]</td>
</tr>
</tbody>
</table>

Data are M ± SD. Post-hoc tests were not used since all p-values indicated non-significant group differences.

**DSMQ**, Diabetes Self-Management Questionnaire; **HbA1c**, glycated haemoglobin; **ANOVA**, Analysis of Variance; **M**, mean; **SD**, standard deviation.

Table 4: Distribution of glycemic control groups according to insulin regimens, gender and age groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Categories</th>
<th>Good glycemic control*</th>
<th>Medium glycemic control†</th>
<th>Poor glycemic control‡</th>
<th>Chi-square (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin regimen</td>
<td>Premixed</td>
<td>6(9.0%)</td>
<td>8(11.9%)</td>
<td>53(79.1%)</td>
<td>12.071(.002)</td>
</tr>
<tr>
<td></td>
<td>Basal bolus</td>
<td>10(30.3%)</td>
<td>8(24.2%)</td>
<td>15(45.5%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>11(23.4%)</td>
<td>9(19.1%)</td>
<td>27(57.4%)</td>
<td>5.040(.080)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>5(9.4%)</td>
<td>7(13.2%)</td>
<td>41(77.4)</td>
<td></td>
</tr>
<tr>
<td>Age groups</td>
<td>≤ 10 years</td>
<td>8(19.5%)</td>
<td>11(26.8%)</td>
<td>22(53.7%)</td>
<td>18.428(.001)</td>
</tr>
<tr>
<td></td>
<td>11-19 years</td>
<td>4(8.0%)</td>
<td>3(6.0%)</td>
<td>43(86.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 20 years</td>
<td>4(44.4%)</td>
<td>2(22.2%)</td>
<td>3(33.3%)</td>
<td></td>
</tr>
</tbody>
</table>

Data are n(%). * HbA1c ≤ 7.5%(58 mmol/mol); † HbA1c 7.6 – 8.9%(60 – 74 mmol/mol); ‡ HbA1c ≥ 9.0%(75 mmol/mol).
Discussion and Conclusions

This study suggests non-significant correlation of HbA1c with overall self-care and health-care use in patients with type 1 diabetes. There is negatively significant correlation of HbA1c with dietary control albeit to a weak strength ($r=-.209; p-value=.037$). A finding similar to studies used diet in self-management questionnaires (9)(17).

Correlations with glucose management and physical activity were positive though non-significant. It is likely that knowledge affects glycemic control by frequency of monitoring blood glucose (18). Agha et al. study suggested that glycemic control is still poor in children despite of home monitoring of glucose and introduction of new insulin (19). Physical activity was shown to reduce the burden of disease in adolescents by a multicenter cross-sectional study (20).

Comparison of insulin regimens shows a superior HbA1c level with lesser overall self-care, GM, PA, and HU were achieved in basal-bolus group. Nonetheless, there are non-significant differences in DC and SMBG. Testa et al. study proved that satisfaction was impacted more positively by improved quality of life, reduced glucose variability, and better glycemic control with basal-bolus regimen compared with premixed regimen(21).

Limitations of this study may include: an obvious lack of information on the exact magnitude of diabetes in Iraq which affects estimating sample size, lower ages and/or educational level for the questionnaire to be self-administered; and recall bias of caregivers regarding most data which were not recorded in hospital profiles.

In conclusion, this study suggests a slight correlation between glycemic control and self-care activities in patients with type 1 diabetes although non-significant in sum score. The research also points that the basal-bolus regimen was better in long-term glycemic control despite the fact that patients had lower self-care as compared with the premixed group. Further research is hence needed to provide more evidence on diabetes self-care.

Ethical Considerations: A verbal consent was taken from patients and written approval for access to patient hospital records to be used in a scientific paper was certified by legal sectors.

Acknowledgment

To the hospital staff and clients who have shared their knowledge with us, we are grateful.

Conflict of Interest: Authors declare no conflict of interest.

Source of Funding: There was no funding source for this research.

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6. American Diabetes Association. Standards of Medical Care in Diabetes 2017 Sec. 8: *Pharmacologic approaches to glycemic treatment.*


Antibiotics Susceptibility and Bacterial Profiles of Urinary Tract Infected Patients in Ramadi City Hospital, Iraq

Zainab Khamees Abbas
College of Medicine, University of Anbar, Iraq

ABSTRACT

Background: Urinary tract infections (UTIs) are considered one of the few diseases which cannot be treated by antibiotics. These infections stand second place among the populations who are infected by bacteria. It is also estimated that in a year, among 1000 person nearly 18 individuals are affected by such infections. Additionally, UTIs are mainly caused in hospitalized patients. The aim of current study was to define urinary tract infections (UTIs) analysed in Iraq with specific importance on the bacterial profile, antimicrobial susceptibility pattern.

Method: This study was done at Ramadi Teaching Hospital, Iraq during the period from October 2017 to May 2018. A total 142 midstream urine samples were collected, cultured and examined under microscope and suitable biochemical tests were conducted to identify properly. Antimicrobial susceptible tests were performed by means of an automatic system Vitek MS, a highly stable and accuracy equipment for specific isolation and the detection of bacterial sensitivity technique as recommended by Clinical Laboratory Standard Institute guidelines.

Results: In total (75) samples were considered for analysis and nearly 52.81% were pointed as positive samples without contaminants. Among the available isolated bacteria, E. coli was found to be more effective in causing infections and the antibiotics that fight against the bacteria was found to be Amikacin, Gentamicine and Ciproflaxacin, respectively.

Conclusion: It can be concluded that E. coli covered a wider range in causing urinary tract infection conducted in Ramadi Teaching Hospital, In addition, Amikacin, Gentamicine and Ciproflaxacin were the most effective antibiotics against this infection. Antimicrobial drug resistance should be monitored regularly to expand the therapeutic guidelines and principles.

Keywords: UTI, culture and sensitivity test, E. coli, Amikacin.

Introduction

Urinary tract infections (UTIs) are considered one of the few diseases which cannot be treated by antibiotics. These infections stand second place among the populations who are infected by bacteria. It is also estimated that in a year, among 1000 person nearly 18 individuals are affected by such infections. Additionally, UTIs are mainly caused in hospitalized patients [1]. Bacterial growth in the urinary tract results in infections and is found to be available commonly over a wide range [2,3]. UTIs affect males and females of all age groups. Basically, women possess short urethra than men which is responsible for affecting women in larger proportions in comparison to men [4-6]. Bacteria present in rectum propagate to urethra thereby causing tract infection [7].

Normally, Staphylococci, Proteus, Enterococci bacteria insulates from internally admitted patients, while considering external patients, E. coli is said to be the most predominant factor. UTI is infrequently caused by an anaerobic organism, whereas the active young-aged women are affected by coagulase-negative Staphylococci [8-11]. A rise of antibiotic resistant concerns the health of patients especially in developing countries [12]. UTI is classified into different types such as lower and upper UTI. Commonly, infection occurs mainly on the urethra (urethritis) or bladder (cystitis).

Infections that occur in kidneys (pyelonephritis), ureters (ureteritis), or both are considered as the upper UTI. Due to the problem of lower UTI, all individuals face upper UTIs. Complications in urinary tract result
The present study was Nearly 142 urine samples were obtained. Further, selected colonies were identified is examined. Crystal, epithelial cells, color, reaction and appearance were investigated. cut-off for leukocyturia: 10-15 leukocytes/field, RBCs, and processing of 142 samples were performed for ICU patients.

Appropriate treatment for managing urinary tract infection is remarkably found to be a tedious task. Because of the rapid developments in isolating bacterial species, bacterial profile and etiology of the pathogens changes significantly in the past decades considering community and nosocomial infections. In spite of containing plenty of antibiotics in hand, restrictions on such antibiotics are enhanced considerably because of the inappropriate utilisation that restricts therapeutic options. Information about the pathogen type that causes infection in urinary tract and their resistive immunities helps the clinician to select an appropriate empirical treatment. Thus, the aim of the current study was to determine bacterial profile and antibiotics susceptibility pattern of infected urinary tract insulated from admitted patients in Ramadi Teaching Hospital.

Materials and Method

**Designed area of study:** The present study was performed in Microbiology department, Ramadi Teaching Hospital in Iraq from October 2017 to May 2018 and involved the admitted patients with inserted urinary catheter for greater than 48 hours in ICU. The patients who had any UTI symptoms before inserting the catheter, were excluded from the study.

**Sample Collection:** Nearly 142 urine samples were collected using clean midstream urine samples and were placed in sterile containers with broader mouth from infected patients who did not consumed antibiotics for fifteen days. The containers were taken suitable aseptic precautions using sterile disposable syringe after the catheter tubes were cleaned and clamped. To perform culture and sensitivity analysis, the collected samples were provided and stored in the department of microbiology. The 2-ml samples of urine were initially centrifuged at 3000×g for a duration of 10 min and tested at 400× magnification in which is the significant cut-off for leukocyturia: 10-151 leukocytes/field, RBCs, crystal, epithelial cells, color, reaction and appearance is examined.

Isolation of uropathogens is performed by inoculating μL of samples using a surface streak procedure. The inoculated samples were then subjected to blood agar, Pepton water, Simmon citrate agar, EMB, TSI, Semi-solid nutrient agar and a MacConkey agar plates, respectively. The above said treatments were autoclaved at a temperature of 121°C for a duration of 15 min and then finally incubation for 24 to 48 hours at 37°C temperature.

Identification of bacterial species: The urine culture with colony forming units (CFU)/mL >105 exists for not more than two microorganism is said to be positive UTI, whereas the occurrence of such culture units for more than two bacterial species were found to be contaminated. The observed positive culture subjects to certain biochemical reaction. Bacterial identification relies mainly on characteristics of colony culture, Gram staining and standard biochemical tests.

**Biochemical test:** Selected colonies were identified and differentiated according to culture characteristics; microscopic examination and microbiological analysis were tested biochemically for further confirmation of isolated bacteria. The identification of bacteria was performed using several biochemical tests such as indole, catalase, H2S production etc.

**Testing of antibiotic susceptibility pattern:** Further identification of isolated bacteria and their susceptibility to antimicrobial agents were achieved by means of an automatic system ASM ViteK (BioMerieux, Madrid) based on the guidelines followed by Clinical and Laboratory Standards Institute. Controllable requirements of the manufacturer were carried out in a precise manner.

**Results and Discussion**

Frequently, UTI is said to be a main reasonable source of microbial infection. Treatment of UTI patients depends mainly on organism type identification and appropriate choice of antibiotics. Resistance towards the causative bacteria changes depending on the areas and conditions. Observing the susceptibility patterns of antimicrobial agents assists the physician to select suitable beneficial antibiotics thus preventing the development of drug resistance. Initially, collecting and processing of 142 samples were performed for ICU patients.
Out of one 142 patients with catheterized urinary tract infection, 75 (52.81%) patients (21 males and 54 females) were considered positive culture regarding sex and age distribution. The percentage of infected females was larger than that of males. Similar prevalence was reported by [20], the percentages of males and females affected by urinary tract infection that was graphically represented in Figure (1). Moreover, Table (1) presented the significant P values of different age groups.

The yielded Gram negative bacterial species were isolated from 75 samples positive cultures showed significant growth of pathogens. Table (2) showed the distribution of the positive cultured samples on the basis of age and sex.

**Figure 1: Distribution of study subjects according to age group and gender**

Table 1: Significant P values of different ages

<table>
<thead>
<tr>
<th>Age group/yr</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20</td>
<td>13</td>
<td>26</td>
<td>39</td>
<td>0.034*</td>
</tr>
<tr>
<td>21-40</td>
<td>15</td>
<td>31</td>
<td>46</td>
<td>0.013*</td>
</tr>
<tr>
<td>41-60</td>
<td>17</td>
<td>28</td>
<td>45</td>
<td>0.101</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>0.285</td>
</tr>
</tbody>
</table>

*Indicates a significant difference at 0.05 level

Table 2: Positive culture sample distribution related to age and sex

<table>
<thead>
<tr>
<th>Age group/yr</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20</td>
<td>3</td>
<td>11</td>
<td>14</td>
<td>0.033*</td>
</tr>
<tr>
<td>21-40</td>
<td>5</td>
<td>17</td>
<td>22</td>
<td>0.011*</td>
</tr>
</tbody>
</table>

Table 3: Percentages of sex distribution of infected subjects

<table>
<thead>
<tr>
<th>Bacterial species</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>12</td>
<td>32</td>
<td>44</td>
</tr>
<tr>
<td>K. Pneumonia</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>P. mirabiles</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>P. aerug.</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>S. Haemolyticus</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Sphingomonas</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>E. feacalis</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>52</td>
<td>75</td>
</tr>
</tbody>
</table>

Table 4: Significant P values of different ages

<table>
<thead>
<tr>
<th>Bacterial species</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>12</td>
<td>32</td>
<td>44</td>
<td>0.002**</td>
</tr>
<tr>
<td>K. Pneumonia</td>
<td>3</td>
<td>7</td>
<td>10</td>
<td>0.206</td>
</tr>
<tr>
<td>P. mirabiles</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>0.401</td>
</tr>
</tbody>
</table>

* The differences are significant at 0.05 level

Table (3) showed the percentages of males and females affected by different bacterial species in urinary tract infections, P values were presented in Table (4). This study showed that the bacterial species E. coli (44) was considered as the most commonly isolated species that caused severe urinary infections among Gram-negative bacteria. The findings of this study were supported by findings from other studies [21-23].

Table (4) represented the different bacterial isolates according to Antibiotics based on Vitek 2 reports. The output results shows higher rate values of UTI is affected by E. coli (44) followed by Kleb. Pneumonia (10) and the minimum affected rate are caused due to Sphingomonaspaucimobilis (2). Inaddition to this, E. coli is registered as the commonly insulated bacterial species from females (32 out of 44). The antibiotic sensitivity pattern reveals that extreme sensitivity values is offered by the antibiotics Amikacin, Gentamicine and Ciprofloxacin respectively, in which the maximum value of resistant towards the urinary infections are possessed by Gentamicine followed by Ciprofloxacin antibiotics.
Conted…

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>0.655</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. aerug.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Haemolyticus</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Sphingomonas paucimobilis</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>E. faecalis</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23</td>
<td>52</td>
<td>75</td>
<td>0.001**</td>
</tr>
</tbody>
</table>

** The differences are significant at 0.01 level

The best ever efficient antibiotics that fight against E. coli bacterial species were Amikacin, Gentamicine and Ciproflaxacin. The consistency and higher levels of susceptibility pattern of E. coli against nitrofurantoin is influenced by its narrow spectrum, restricted indications, its limited tissue distribution and imperfect bacterial contacts in outer region of urinary tract \[24\]. These results coincide with previous studies \[20\].

Current study does not relate the maternal age, occupation, address, parity, marital status, education etc. with the isolated bacterial species. On the other hand, in other literature studies, certain risk factors were considered as UTI was related to maternal age and parity. However, previous studies did not characterize these effects in a detailed manner. Certain studies indicated that the existence of UTI usually depends on age, indicating that older people are commonly affected by such infections, whereas other studies pointed that it affects young age groups in high percentages \[25\].

The detection of phenotypes in resistant mechanism operates fast with effective costs, necessitate low labour appliance and avoids the requirement of higher technical expertise. These advantages make this detection to accomplish daily even in poor countries. The output of such detection produces better and effective results.

Figure 2: Distribution of Gram-negative isolates based on antibiotics obtained by Vitek 2 reports

Bacterial profiles indicated higher infection rate although it exists within a stated range. While inserting a catheter requires certain aseptic standards to be followed including the antibiotics policy formulation by adopting surveillance strategies etc., higher levels of resistant bacteria restrict the utilization of antimicrobial agents in therapy. Most challenging and aim of ICU that covers a wide range is said to be the antimicrobial resistance. Multidrug resistant strains are continuously surveyed to assist the selection of suitable efficient treatment and also to access the usefulness in adopting the controllable strategies of infection \[26\].
Conclusion

The necessity of effective and enhanced UTI diagnosis is significant. Treatment based on bacterial profile and antimicrobial susceptibility pattern improves the health of patients as well as paves the way to enhance the utilization of antibiotics against multidrug-resistant pathogens. Vitek MS showed better and higher accuracy regarding the analysis of Gram-negative bacteria in urine samples with CFU ≥105. Hence, it offers a reliable and perfect method in diagnosing urinary tract infection caused by Gram-negative bacteria. This method does not work suitably in case of Gram-positive bacteria. E.coli causes more effect on urinary tract when compared to other bacteria. The appropriate antibiotics that fight against the isolated bacterial species particularly E. coli were Amikacin, Gentamicine and Ciproflaxacin.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding.

REFERENCES


Variation of GTFD Gene from *Streptococcus Mutans* Local Isolate from Iraqi Patients

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ABSTRACT

The oral cavity is considered as a complex microbial community. *Streptococcus mutans* has been the major bacteria that cause dental caries. This species of bacteria have many factors to facilitate colonized the tooth surfaces causing caries and lesions.

In this study, (150) samples include buccal swabs, which were randomly collection from 150 patient’s oral cavities (75 female and 75 male) during the period from November 2017 to April 2018 from non-government dental clinical in Baghdad, Karkh and Rusafa. The age of patients ranged from 25 to 50 years. The samples were cultured on selective and enriched culture media. Then, *Streptococcus mutans* isolates were identified by using Polymerase Chain Reaction (PCR) technique and sequencing of gtfD gene.

The results of the sequencing showed congruence with isolation *Streptococcus mutans* of amplified product of gtfD gene appeared 93% compatibility. (540 to 807) number of nucleotide from the gene of a gene bank, and have number score (403) bits, expect (1e-108), and corresponds to the global number ID: JX073019.1.

PCR method was used to detect gtfD gene in buccal swabs which is more sensitive than API 20 strepts and culture media to identify *Streptococcus mutans*. The study showed that oral *Strept. mutans* isolates had gtfD gene encoding glucosyltranferase which responsible for *Streptococcus mutans* pathogenicity and causing dental cavies in different age groups.

**Keywords:** Dental caries, Oral *Streptococcus mutans*, PCR technique, gtf gene

Introduction

*Streptococcus mutans* is Gram-positive streptococcus bacterium, grow in facultative anaerobes conditions. They are present in the human oral cavity causing teeth necrosis [¹]. It is a major pathogen of dental caries as a result of its ability to adhere and grow on the teeth surfaces [¹,²]. It is a cariogenic bacterium that hydrolyses the sugar to get energy and gives an acidic environment, which demineralizes the structure of the infected teeth and then dissolves the calcium causing holes [³].

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PCR techniques are useful for the diagnosis and analysis of oral pathogenic streptococci using species specific primers (gtfD) which conceded the target of analyzed gene were done to identify *Streptococcus mutans* [⁴]. Identification and detection of Strep. mutans in clinical samples by using selective and enriched culture media, like Mitis salivarius bacitracin agar is not sufficient alone. However, polymerase chain reaction techniques are needed to identify and differentiate between the species of *Streptococcus*, and it also gives accurate results [⁵]. The aims of this study are to detect gtfD gene and determine the phylogenetic tree in *S. mutans* isolates from dental caries from Iraq patients.

**Materials and Method**

**Sample Collection:** The current study includes (150) samples (buccal swabs), which was randomly collection
from 150 patient’s oral cavities (75 female and 75 male) during the period from November 2017 to April 2018 at non-government dental clinical in Baghdad, Karkh and Rusafa. The age of patients ranged from 25 to 50 years. The samples transported in closed icebox to the medical laboratory.

**Isolation and detection of Streptococcus mutans:** All buccal swabs were cultured on MSBA (Mitis salivarius bacitracin 10% sacarose) (Oxoid) to inhibit the growth of most types of bacteria except Streptococcus mutans. The isolated colonies were subcultured on MSBA agar plates and incubated at 37°C for 24 h and 48 h in anaerobic jar with 5% CO₂ enriched atmosphere[6].

**DNA extraction from Streptococcus mutans:** Buccal swabs were transported to the medical laboratory to culture them on selective and enriched culture media and for extraction the total streptococcal genomic DNA using DNA extraction kit. G- spin DNA extraction kit, intron biotechnology, cat.no. 17045 was used to extract the DNA from Streptococcus mutans: It consists from 25 mL Buffer CL; 25 mL Buffer BL; 40 mL Buffer WA; 10 mL Buffer WB; 20 mL Buffer CE; 50 ea Spin Column/ Collection Tube; 3 mg x 1 vial containing RNase A and 22 g x 1 vial Proteinase K.

**Agarose gel electrophoresis of DNA**

**Agarose gel Preparation:** The procedure of Sambrook et al.,1989 [7] was used to prepare the gel. The agarose gel was prepared in 1.5% condensation by melting 1.5 g of agarose in 100mL of Tris Buffer - EDTA (TBE) buffer. Then, Agarose exposed to heat source to boil; after that, it was left to cool at (45-50°C). The cooled gel poured into the plates in which the plate of agarose support prepared after fixing the comb to make holes that could hold the samples. The gel was poured without making any air bubbles and left for 30 minutes. Then the comb was removed from the solidified agarose. The plate was fixed for the Electrophoresis and the tank was filled with Tris buffer - EDTA (TBE) to cover the gel surface.

**Preparation of Sample:** Three microliters of the processor loading buffer (Intron/Korea) was mixed with five microliters of the supposed DNA to be electrophoresis (loading dye), and electrical current of 7 v/cm was used for (1-2) hrs. Then, the gel was tested using UV light after putting the gel in pool contain on 30µL Red safe Nucleic acid staining solution and 500 mL from distilled water.

**KAPA Universal DNA Ladder:** DNA ladder (1000-10000bp) was used for determining the approximate size and quantity of double stranded DNA on agarose gel.

**Primers are used in the interaction:** The lyophilized primers were dissolved in the ddH₂O to get a final concentration of 100pmol/µL as a stock solution. It was kept at -20°C to prepare 10pmol/µL concentration as work primer suspended; 10µL of the stock solution mixed with 90µL of the free ddH₂O to reach a final volume (100µL), which investigated by using IDT (Integrated DNA Technologies company, Canada).

**Table 1:** The specific primer rad of gene

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence</th>
<th>Tm(°C)</th>
<th>GC(%)</th>
<th>Product size(bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td>5’-TTATATAGTCGTCAAGATGGA-3’</td>
<td>47.7</td>
<td>33.3</td>
<td>350</td>
</tr>
<tr>
<td>Reverse</td>
<td>5’-CACTAAGCTTTACAAATATGGA-3’</td>
<td>45.6</td>
<td>28.6</td>
<td></td>
</tr>
</tbody>
</table>

**Maxime PCR PreMix kit (i-Taq) 20µlrxn:** The kit has consisted of i-Taq DNA polymerase 5U/µL; DNTPs 2.5mM; Reaction buffer (10X) 1X; Gel loading buffer 1X. PCR program: Taq PCR PreMix 5µL was used. Each Forward and Reverse primer (10picomols/µL) were put in an Eppendorf tubes, then 1.5µL of template DNA was added, and the volume was completed to 25µL by adding 16.5µL distilled water. The PCR amplification reaction was performed in a thermocycler with the following cycling parameters (Table 2). The PCR products were analyzed by electrophoresis in 2% Agarose gel–TBE buffer. The gel was stained with Red safe concentration (20,000X) and photographed under UV light. The size of bands was compared with DNA ladder which conceder as size standard.

**Table 2:** The optimum conditions for gtfD gene detection

<table>
<thead>
<tr>
<th>No.</th>
<th>Phase</th>
<th>Tm(°C)</th>
<th>Time(min.)</th>
<th>No.of cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initial Denaturation</td>
<td>95</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Denaturation-2</td>
<td>95</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Annealing</td>
<td>60</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Extension-1</td>
<td>72</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Extension-2</td>
<td>72</td>
<td>7</td>
<td>35</td>
</tr>
</tbody>
</table>
The PCR gave Streptococcus mutans which in Baghdad governorate in proportion 54.6%. Streptococcus mutans selective media. In contrast, Hadi disease had 100% were taken from patients with the dental and periodontal Xigheer and Sahib in Karbala was 39.39% from patients with teeth plaque. Whereas, positive culture for Mudallal isolates gave Gram positive cocci, arranged in pairs and examination appeared that the and oxidase. The results of light microscopic results for Voges Proskauer test, and negative for catalase and maltose fermentation. Also, they gave positive glucose and cellobiose fermentation, esculin hydrolysis and genotyping of Streptococcus mutans in patients with dental caries were almost identical with some substitutions.

The results of a current study were compatible with Flayyih et al., [15]. The researchers found that 29 of Streptococcus mutans isolates isolated from saliva and dental plaques samples in patients aged from 4 to 65 years old. Also, they revealed that all Streptococcus mutans isolates by using PCR technique had bands with 324bp which represent gtfD gene encoding a glucosyltransferase gtfD that play important role in dental plaque and caries. Also, the results of a current study are similar to the results of Hoshino et al., 2004 [16]. They were found that Streptococcus mutans had gtf gene codes for glucosyltransferase that synthesize glucan which plays an important role in dental plaque, and the PCR methods is useful for the gtfD gene detection there for oral Streptococcus mutans can be successfully used in clinical applications.

The results of a current study are compatible with AL-Mudallal et al. [6]. They found that the percentage of the positive culture for Streptococcus mutans on MSA medium was 39.39% from patients with teeth plaque. Whereas, Xigheer and Sahib in Karbala [11] found that all 100 samples were taken from patients with the dental and periodontal disease had 100% Streptococcus mutans which isolated on selective media. In contrast, Hadi et al., 2012 [12] isolated Streptococcus mutans from patients suffered from gingivitis in Baghdad governorate in proportion 54.6%. gtfD gene gave 350bp band for all isolates under study (Fig.2). Our result is compatible with study in Japan. Nomura et al., 2006 [17] revealed that the PCR for gtfD gene gave an approximately 4.5kb band for two isolates and 5.8kb band for other isolate isolated from the patient with endocarditis. Multiple alignments of the nucleotide sequences of the gtf genes were studied by Fujiwara et al., 1998 [14]. They found that gtfB, gtfC and gtfD genes isolated from Streptococcus mutans in patients with dental caries were almost identical with some substitutions.

The results of a current study were compatible with Flayyih et al., [15]. The researchers found that 29 of Streptococcus mutans isolates isolated from saliva and dental plaques samples in patients aged from 4 to 65 years old. Also, they revealed that all Streptococcus mutans isolates by using PCR technique had bands with 324bp which represent gtfD gene encoding a glucosyltransferase gtfD that play important role in dental plaque and caries. Also, the results of a current study are similar to the results of Hoshino et al., 2004 [16]. They were found that Streptococcus mutans had gtf gene codes for glucosyltransferase that synthesize glucan which plays an important role in dental plaque, and the PCR methods is useful for the gtfD gene detection there for oral Streptococcus mutans can be successfully used in clinical applications.

gtfD gene was used to study horizontal transmission of glycosyl-hydrolase through the family [17]. The current study describes the good identification of phenotyping and genotyping of gtfD gene in Streptococcus mutans isolated from patients with dental caries and the results are compatible to the results which done by [18]. They were used 1.2% agarose gel electrophoresis to depict the presence of gtfD gene and confirmed the Streptococcus mutans presence in the samples. Also, they were extracted genomic DNA from Streptococcus mutans which analyzed with 1% agarose gel electrophoresis. Positive PCR amplification by using primer pair specific to 16S rDNA was at 1,485bp that compared with standard 1KPb.

**Figure 1: Gel electrophoresis of genomic DNA extraction from bacteria, 1% agarose gel at 7v/cm2 for 1:15 hours**
Figure 2: PCR product the band size 350 bp. The product was electrophoresis on 1% agarose at 7v/cm². 1x TBE buffer for 1:30 hours. N: DNA ladder (100).

**Sequencing:** The sequencing and BLAST analysis of partial *gtfD* (figure 1, 2). The results of the sequencing showed congruence with isolation *Streptococcus mutans* of amplified product of *gtfD* gene appeared 93% compatibility. (540to807) number of nucleotide from gene of gene bank, and have number score (403) bits, expect (1e-108), and corresponds to the global number ID: JX073019.1 The results as shown (Figure 3), after alignment of product amplification of *gtfD* gene for first group having seven Transition (A>G, A>G, A>G, A>G, T>C, A>G and G>A, and having eleven Transversion (A>T, T>A, G>T, A>T, A>T, T>G, A>T, C>A, G>T, T>A and C>A) from the Gene Bank. *gtfD* gene was successfully amplified using specific PCR primers for the gene.

**Streptococcus mutans** strain UA140 glucosyltransferase-S (*gtfD*) gene, complete cds Sequence ID: JX073019.1

<table>
<thead>
<tr>
<th>Score</th>
<th>Expect</th>
<th>Identities</th>
<th>Gaps</th>
<th>Strand</th>
</tr>
</thead>
<tbody>
<tr>
<td>403 bits(446)</td>
<td>1e-108</td>
<td>250/268(93%)</td>
<td>0/268(0%)</td>
<td>Plus/Plus</td>
</tr>
</tbody>
</table>

Alignment statistics for match #1

Query
```
ATATTATATATTGTTCTGATGGTCAGCCTAAGAAATTTTGCTCTAACCCTAATGG 60
```

Sbjct
```
ATATTATTATATTGTTCTGATGGTCAGCCTAAGAAATTTTGCTCTAACCCTAATAG 599
```

Query
```
CAAAATTACTCTACTTCCAATAAAATACAGGAGCCCTAACCAGGACACCTTCTTATTCAATT 120
```

Sbjct
```
CAAAAGTACTTCTACTTCCAATAAAATACAGGAGCCCTAACCAGGACACCTTCTTATTCAATT 659
```

Query
```
TAAAACGGGTAAACAAATATGAAGCAACGATTATACTATCCCACAGTCATTTTTGCAATTTG 180
```

Sbjct
```
TAAAACGGGTAAACAAATATGAAGCAACGATTATACTATCCCACAGTCATTTTTGCAATTTG 719
```

Query
```
TGAAAATCCAGCTTTGAAATATTTGAACATATGTCACAGCTTTGTCATTTTGGTAACGCC 240
```

Sbjct
```
TGAAAATCCAGCTTTGAAATATTTGAACATATGTCACAGCTTTGTCATTTTGGTAACGCC 779
```

Query
```
TAGGGATATTTTTAAAAATGGGAAAAACG 268
```

Sbjct
```
TAGGGATATTTTTAAAAATGGGAAAAACG 807
```

Figure 3: BLAST alignment
Phylogenetic tree construction: This study takes care for phylogenetic analysis for geographic genetic distances determination. The analyzes phylogeny occurred for specific genes-of-interest, partial-length of gtfD gene. The genetic dimension between Iraq and the isolates of the world is detailed according to the Phylogenetic tree and the comparison table. Hierarchical cluster analysis determine the following clusters: large Cluster divided into several neck: first root USA: Rochester NY, Papua New Guinea and IRAQ the genetic dimension was by 1.132, second root Japan and Japan Osaka the genetic dimension was by 1.113, third root Texas the genetic dimension was by 1.598, fourth root USA and Korea the genetic dimension was by 1.318 (Figure 4).

Figure 4: The clustering tree of the sequencing of Streptococcus mutans of gtfD gene

Conclusion

PCR method was used to detect gtfD gene in buccal swabs which is more sensitive than API 20 streps and culture media to identify Streptococcus mutans. The study showed that oral Strept. mutans isolates had gtfD gene encoding glucosyltranferase which responsible for Streptococcus mutans pathogenicity and causing dental cavies in different age groups.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Peripheral Neuropathy Types of Diabetic Patients in Babylon Province

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ABSTRACT

Background: Diabetes Mellitus is a clinical syndrome characterized by hyperglycemia due to absolute or relative insulin deficiency. The prevalence of diabetic peripheral neuropathy (DPN) is 13.4% in Iraqi patients. In Saudi Arabia the prevalence of diabetic peripheral neuropathy is 66.3%. Distal symmetric sensorimotor peripheral neuropathy is the most common type of diabetic neuropathy. Therefore, the aim of current study was to determine the most frequent peripheral neuropathy type in diabetic peripheral neuropathy patients who visit the diabetic center in Babylon Province.

Method: Three hundred individuals were considered in the study. They were divided into two groups labeled as A and B. Group A involved 150 diabetic-free individuals and considered as a control group. Group B involved 150 diabetic diagnosed individuals. All participants are underwent neurological examination and nerve conduction study (NCS). The study was carried out at Mirjan and Al-Sadeq Teaching Hospitals in Babylon province during the period from Oct.2017 to Sep.2018.

Results: The electrophysiological changes assessed by NCS showed that there was a significant decrease in amplitude, conduction velocity for motor and sensory nerves in patients with peripheral neuropathy in comparison with that of control group (P<0.05). Also, there was prolongation in the F wave and distal latencies in patients with peripheral neuropathy in comparison with that of the control group, P value <0.05.

Conclusions: From those findings we can conclude that Polyneuropathy is the most frequent type of neuropathy (62%) followed by mononeuropathy (16.7%) and mononeuropathy multiplex (14%). In addition, the sensorimotor fibers are most frequent ones among other nerve fiber types (71.2%), but the early fibers affect are sensory fibers.

Keywords: Iraq; Diabetic Patients ; Neuropathy Types.

Introduction

Diabetes Mellitus (DM) is a clinical syndrome characterized by hyperglycemia due to absolute or relative insulin deficiency (¹). The prevalence of diabetic peripheral neuropathy (DPN) is 13.4% in Iraqi patients. In Saudi Arabia the prevalence of diabetic peripheral neuropathy is 66.3% (²). Distal symmetric sensorimotor peripheral neuropathy is the most common type of diabetic neuropathy. It is typically presented as a slowly progressive primarily sensory deficit in a length-dependent fashion. The symptoms are usually starting in the feet and spreading upwards, evoking the classic stocking glove distribution (³). These symptoms of DPN vary depending on fiber type involved. It is noteworthy that large fiber involved proprioception and light touch would be impaired. Small fiber involved pain and temperature perception would be impaired leading to paresthesias, dysesthesias, and/or neuropathic pain. Distal weakness occurs only in the most severe cases. Diabetic peripheral neuropathy may be presented early with diminished or absent deep-tendon reflexes, particularly the Achilles tendon reflex (⁴ and ⁵). Diabetic peripheral neuropathy can be diagnosed by variety of ways including full history, neurological examination and electrophysiological study (NCS). The
Electrophysiological changes include prolongation of latency (sensory and motor), decreased in amplitude & decreased in conduction velocity.

These changes are elicited first in the sensory nerves of lower limbs. The parameters abnormalities of NCS can reflect the pathological pattern of DPN.

Patients and Method

Three hundred individuals were considered in the study. They were divided into two groups labeled as A and B. Group A involved 150 diabetic free individuals and considered as control group. The other group, group B, involved 150 diabetic diagnosed individuals. The study was carried out at Mirjan teaching hospital and Al-Sadeq Teaching Hospital in Babylon province during the period from Oct.2017 to Sep.2018. All participants underwent neurological examination and nerve conduction study (NCS). The NCS can be assessed by motor and sensory nerves examination. Motor NCS can be done by applying surface electrode as recording electrode on the belly of muscle and reference electrode on the tendon of muscle. The motor nerves examined in this study were median and ulnar nerves, in upper limbs, and peroneal and posterior tibial nerves in lower limbs.

The sensory NCS can be assessed by applying ring electrode on the way of examined nerve where the nerve is more superficial. The sensory nerves examined in this study were median and ulnar nerves, in the upper limbs, and sural nerve in the lower limbs.

The amplitude, latency and conduction velocity of sensory and motor nerves were recorded by special machine for all participants. The F wave latencies of the motor nerves were recorded, too. These parameters are known as NCS parameters.

Results

The results of study groups were analyzed. The mean and standard error (SE) for sociodemographic data were summarized in Table (1).

Table 1: Mean and SE of participants’ sociodemographic data

<table>
<thead>
<tr>
<th>Study group</th>
<th>Mean ± SE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>Age</td>
<td>50.06 ± 0.09</td>
</tr>
<tr>
<td></td>
<td>BMI</td>
<td>28.24 ± 0.41</td>
</tr>
<tr>
<td></td>
<td>HbA1c</td>
<td>8.25 ± 0.09</td>
</tr>
<tr>
<td>Controls</td>
<td>Age</td>
<td>45.04 ± 0.03</td>
</tr>
<tr>
<td></td>
<td>BMI</td>
<td>27.87 ± 0.28</td>
</tr>
<tr>
<td></td>
<td>HbA1c</td>
<td>5.02 ± 0.01</td>
</tr>
</tbody>
</table>

Figure (1) showed that females are more than males in patients group. Moreover, Figure (2) showed that patients with type II diabetes were more than those with type I.

Table 2: Mean and SE of latency, conduction velocity and amplitude of motor nerves of upper and the lower limbs

<table>
<thead>
<tr>
<th></th>
<th>Cases N = 150</th>
<th>Controls N =150</th>
<th>t-test</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SE</td>
<td>Mean ± SE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median. ML</td>
<td>4.29 ± 0.09</td>
<td>2.83 ± 0.02</td>
<td>15.56</td>
<td>0.001</td>
</tr>
<tr>
<td>Median. MA</td>
<td>7.71 ± 0.24</td>
<td>10.98 ± 0.15</td>
<td>-11.29</td>
<td>0.001</td>
</tr>
<tr>
<td>Median. MCV</td>
<td>46.72 ± 0.62</td>
<td>62.01 ± 0.61</td>
<td>-17.45</td>
<td>0.001</td>
</tr>
<tr>
<td>Ulnar. ML</td>
<td>3.59 ± 0.05</td>
<td>2.10 ± 0.06</td>
<td>10.673</td>
<td>0.001</td>
</tr>
<tr>
<td>Ulnar. MA</td>
<td>7.10 ± 0.18</td>
<td>8.06 ± 0.18</td>
<td>-3.690</td>
<td>0.001</td>
</tr>
<tr>
<td>Ulnar. MCV</td>
<td>50.80 ± 0.71</td>
<td>60.95 ± 0.41</td>
<td>-12.266</td>
<td>0.001</td>
</tr>
<tr>
<td>Peroneal L</td>
<td>3.70 ± 0.20</td>
<td>2.71 ± 0.04</td>
<td>4.69</td>
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</tr>
<tr>
<td></td>
<td>Cases N = 150</td>
<td>Controls N = 150</td>
<td>t-test</td>
<td>P value</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>Mean ± SE</td>
<td>Mean ± SE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Median</td>
<td>31.68 ± 0.31</td>
<td>22.96 ± 0.18</td>
<td>23.775</td>
<td>0.001</td>
</tr>
<tr>
<td>F. Ulnar</td>
<td>31.58 ± 0.30</td>
<td>23.86 ± 0.11</td>
<td>23.525</td>
<td>0.001</td>
</tr>
<tr>
<td>F. Peroneal</td>
<td>39.31 ± 1.01</td>
<td>33.51 ± 0.20</td>
<td>4.096</td>
<td>0.001</td>
</tr>
<tr>
<td>F. Tibial</td>
<td>52.47 ± 1.63</td>
<td>45.57 ± 0.14</td>
<td>4.206</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 3: Mean differences of F wave latencies of examined nerves of upper and lower limbs

However, Table (4) below showed that sensory motor neuropathy was more common nerve fiber type among patients group.

### Table 4: Types of nerve fibers involved in DPN

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory and motor</td>
<td>64</td>
<td>45.7</td>
</tr>
<tr>
<td>Sensory</td>
<td>46</td>
<td>32.8</td>
</tr>
<tr>
<td>Motor</td>
<td>30</td>
<td>21.5</td>
</tr>
<tr>
<td>Total</td>
<td>140</td>
<td>100.0</td>
</tr>
</tbody>
</table>

On the other hand, Table (5) below showed that median nerve is more common nerve affected at level of mononeuropathy. The median with sural nerves were more commonly affected at level of mononeuropathy multiplex among patients group.

### Table 5: Frequency of affected nerves in patients groups

<table>
<thead>
<tr>
<th>Type of neuropathy</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A-Mononeuropathy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1- median neuropathy</td>
<td>17</td>
<td>62.8</td>
</tr>
<tr>
<td>2- ulnar neuropathy</td>
<td>2</td>
<td>6.4</td>
</tr>
<tr>
<td>3-peroneal neuropathy</td>
<td>3</td>
<td>10.3</td>
</tr>
<tr>
<td>4-tibial neuropathy</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>5-surual neuropathy</strong></td>
<td>5</td>
<td>17.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>

**B-Mononeuropathy multiplex**

<table>
<thead>
<tr>
<th>Type of neuropathy</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-surual and median</td>
<td>9</td>
<td>50.7</td>
</tr>
<tr>
<td>2-median and ulnar</td>
<td>4</td>
<td>22.2</td>
</tr>
<tr>
<td>3-median and peroneal</td>
<td>1</td>
<td>5.5</td>
</tr>
<tr>
<td>4-surual and ulnar</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td>5-surual and tibial neuropathy</td>
<td>2</td>
<td>11.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

**Discussion**

Most of participants were females (54.6%) and DM type II (70%). Males (45.4%) and DM type I (30%) were less frequent in our study as shown in Table (1) and Figures (1) and (2). The cause of these results may be due to females having improper glycemic control than males due to hormonal disturbances.

Regarding the NCS parameters changing (amplitude, conduction velocity, latency and F wave) there was prolongation in F wave latency and increment in latency for sensory and motor nerves of DM patients in comparison with controls. Also, there was a decrease in amplitude and conduction velocity of
motor and sensory nerves of DM patients in comparison with controls as shown in Tables (2). The reason for prolongation in F wave latency in DM patients may be due to demyelinating process of motor nerve fibers which means that the antidromically excited nerve needs more time to transmit the travelling signal so cause an increment in F wave latency (7). The cause of prolongation in latency and reduction in conduction velocity of motor and sensory nerve of DM patients may be due to demyelinating process in DM. Also, DM patients showed a decrease in amplitude of motor and sensory nerves. This may be due to a decrease in number of nerve fibers excited. By changing the abovementioned NCS parameters, we could record two types of results labeled as 1-type of peripheral neuropathy in DM patients. 2- type of nerve fiber affected in DPN patients. The most frequent type of peripheral neuropathy is poly neuropathy (62.7%) followed by mononeuropathy (16.7%). The mononeuropathy multiplex and normal NCS were less frequent (14% and 6.7%, respectively) as shown in Table (4). These results may be due to that DM patients were late in their visits to the specialist center and a poor control for their blood sugar level with longer duration of DM. These results were in agreement with those reported by (8-10).

The most common type of nerve fibers affected was sensorimotor fibers (45.7%) as shown in Table (5). This result agreed well with (11-15) who showed that the sensory nerves involvement were more frequent than F wave latencies prolongation. These results may be due to that DM patients had poor control for their blood sugar level and delayed their visits to specialist center. This can give more time to affect both sensory and motor nerve fibers. The motor fiber are less frequently affected than sensory fibers. Also, the sensory fibers were earlier affected. This may be due to the fact that the diameter of a sensory nerve is smaller than motor nerve and travelled longer than motor fiber. This reason made them more susceptible for developing neuropathy and may be the early sign of DPN.

Conclusion
From the results mentioned we can conclude the followings:

1. NCS with neurological examination give important information about DPN in diabetic patients, so this should be performed as a routine schedule in diabetic out-patient.

2. Sensory and motor polyneuropathy can be considered as the most frequent type of DPN in diabetic patients.

3. The mononeuropathy can give us early information about the DPN and the instruction should be given to patients to control the risk factors of DM to improve the outcome.

4. The DPN can be appeared as sensory nerve affected alone as an early stage of DPN when other tests values are normal.

5. The F wave latencies prolongation can be taken as an early sign of motor neuropathy before any changes in motor NCS parameters.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

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Rickets in Babies Under Two Years of Age Who were Delivered as Preterm in Ramadi City

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ABSTRACT

To identify the prevalence of rickets in preterm and term babies, and studying the risk factor associated with this disease in preterm babies as age, sex, residence, type of feeding, and changes in some biochemical tests. Total 200 cases with different ages from one month to two years were included, 100 cases of them were preterm babies and 100 were term babies. Patients who diagnosed as rickets radiologically among preterm babies were studied by history (sex, age, type of feeding, residence and clinical feature) and investigated serologically (serum calcium, phosphorus, alkaline phosphatase and vitamin D).

About 35% of preterm babies were diagnosed as rickets of prematurity and 9% were rickets in term babies. among risk factors, breast milk feeding was significant risk factors while residence and gender variation were found to be not significant risk factors. most common age reported with rickets was between 2 and 12 months. alkaline phosphatase elevated in 91% of cases diagnosed as rickets.

The rickets of preterm babies is an important disease to be studied in Iraq. Breast feeding is an important risk factor of the disease.alkaline phosphatase activity and radiological feature are important for screening.

Keywords: Preterm babies, Rickets, Risk factors

Introduction

Rickets is a disease of growing bone, occurs in children only before fusion of the epiphyses, and is due to unmineralized matrix at the growth plates. Rickets may be seen in young children 6 to 24 months old. Rickets may be caused by vitamin D disorder, calcium deficiency, phosphorus deficiency, renal loss or distal renal tubular acidosis¹.

Prematurity is a live born infants delivered before 37 completed weeks from first day of the last menstrual period².

Rickets in preterm babies has become a significant problem, as the survival rate for this group has increased.

About 80% of transfer for calcium and phosphorus from mother to fetus occurs during the 3rd trimester. Thus, premature birth interrupts this process, especially when breast milk and standard formula do not contain enough calcium and phosphorus to supply the needs of the developing premature infant ²,³ another reason is the high degree of skeletal growth that occur rapidly following birth ⁴.

Rickets of prematurity occurs as early as 1-4 months after birth. Most infants have no clinical manifestations, and the diagnosis is based on radiographic and laboratory findings, although some can have non-traumatic fractures, but most are not suspected clinically ⁵.

Biochemical changes that occur in rickets of prematurity, the serum phosphorus level is low or low-normal, Serum levels of calcium are low, normal, or high. Most patients have normal levels of 25-D. The hypophosphatemia stimulates renal 1α-hydroxylase, so levels of 1, 25-D are high or high-normal. Alkaline phosphatase levels are often elevated, but some affected
infants have normal levels. The diagnosis is confirmed by radiologic evidence of rickets, which is best seen on films of the wrists.\(^5\) Wrist X-ray show thickening of growth plate, fraying, cupping and widening of distal end of metaphysis.\(^6\)

This study aim To describe the prevalence of rickets in premature babies, identify age and sex distribution of rickets and some associated risk factors such us residence and types of feeding and identify the relation between clinical, radiological, and biochemical findings in positive cases in a trial to decrease morbidity among premature infant by early detection of rickets.

**Materials and Method**

Data was collected by direct interview to the parents in the outpatient clinic and in pediatrics ward of Al-Ramadi Teaching Hospital for maternity and children. The parents were given a full explanation about the purpose of the study and assurance about the confidentiality of the information and that the participation was completely optional.

Hospital based cross sectional case control was done on 200 children less 2 years of age, whom attending hospital during the period from the first of October 2017 to the first of April 2018 over a period of 6 months selected randomly.100 cases were preterm and 100 cases were term babies. A specially designed interview sheet was used to collect the information from the family. The sheet includes data on; name, age which categorized into 3 groups under 2 months, from 2-12 months and from 1-2 years, sex, residence whether rural or urban areas, and socioeconomic state, duration of pregnancy to know whether the child is term or preterm, type of feeding; breast, bottle or mixed feeding

Physical examination were performed including all signs of rickets such as; protruding abdomen, weak muscles, craniotabes, frontal bossing, wide fontanel, delayed dentation, rachitic rosary, Harrison groove, wide wrists and leg bowing.

All cases investigated with serum calcium, serum phosphorus, serum alkaline phosphatase and serum vitamin D level. Biochemical investigations were measured by specific method for estimation of their level by experiment laboratory staff.

Wrist X-ray was done by experiment technician and reports of X-rays was done by experiment radiologist, In this study the diagnosis depend on radiological findings.

All cases investigated with X-ray of wrist, looking for signs of rickets which include; fraying, cupping, widening of wrist, decrease bone density. Patient were divided according to maturity into full term(>=37 completed weeks of gestation) and preterm(<37 completed weeks of gestation), 200 cases were studied, of them 100 case full term and 100 case preterm, 35 cases were diagnosed as rickets in preterm and 9 cases in term children, rachitic preterm babies were studied fully and that of terms babies used to compare for the incidence only.

Exclusion criteria: All children more than two years old and Children on tonics and vitamin D supplements.

Statistical analysis was done by using SPSS program and Microsoft Excel 2007 system.

**Results**

The total cases were 200, half of them were term and other half were preterm babies, 9 out of 100 cases from term babies were diagnosed as rickets while 35 case from preterm sample were diagnosed as rickets.

The prevalence of rickets among term children 9%, as shown in figure (1).

![Figure 1: Prevalence of rickets in term children](image)

The prevalence of rickets among preterm children 35%, as shown in figure (2).

![Figure 2: prevalence of rickets in preterm children](image)
Regarding gender variation among preterm positive cases showed non-significant deference. Table 1.

Table 1: Distribution of cases in regard to sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19(54%)</td>
</tr>
<tr>
<td>Female</td>
<td>16(46%)</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
</tr>
</tbody>
</table>

P value >0.05 non-significant

Most of the cases in preterm were between 2 months and 1 years old, 26 case (74%), as shown in table 2.

Table 2: Distribution of cases in regard to age

<table>
<thead>
<tr>
<th>Age</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 months</td>
<td>0</td>
</tr>
<tr>
<td>2 months-1 year</td>
<td>26(74%)</td>
</tr>
<tr>
<td>1 year – 2 years</td>
<td>9(26%)</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
</tr>
</tbody>
</table>

P value among different age groups <0.05 significant

Most off the cases were breast feed, 26(74.3%) with significant relationship, as shown in table 3.

Table 3: Distribution of cases in regard to type of feeding

<table>
<thead>
<tr>
<th>Type of feeding</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle</td>
<td>7(20%)</td>
</tr>
<tr>
<td>Breast</td>
<td>26(74.3%)</td>
</tr>
<tr>
<td>Mixed</td>
<td>2(5.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
</tr>
</tbody>
</table>

P value <0.05 significant

The relationship between rickets in preterm babies and residence was non-significant as shown in table 4.

Table 4: Distribution of cases in regard to residence

<table>
<thead>
<tr>
<th>Residence</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>20 (57.1%)</td>
</tr>
<tr>
<td>Rural</td>
<td>15 (429%)</td>
</tr>
<tr>
<td>total</td>
<td>35</td>
</tr>
</tbody>
</table>

P value >0.05 not significant

Serological findings in diagnosed preterm rickets radiologically reveal that serum calcium was low in 11% of cases, serum phosphate was low in 60% of cases, serum alkaline phosphatase was high in 91% of cases and serum vitamin D level was low in 31% of cases. as shown in table (5).

Table 5: Biochemical changes

<table>
<thead>
<tr>
<th>Laboratory test</th>
<th>Normal</th>
<th>Low (11%)</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>31</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>14</td>
<td>21(60%)</td>
<td>0</td>
</tr>
<tr>
<td>Alkaline phos.</td>
<td>3</td>
<td>0</td>
<td>32(91%)</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>24</td>
<td>11(31%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Discussion

Rickets of prematurity and neonatal metabolic bone disease are terms used to describe the reduced skeletal mineralization seen in preterm babies, this makes the preterm newborn more susceptible to fractures during minimally invasive procedures and even with routine handling while in the Neonatal Intensive Care Unit. 6, 7

In this study, the prevalence of rickets was (35%) of preterm babies, other study in Iran 8 showed (23%) of premature babies develop rickets, in Nairobi 9 (58.8 %) and in Korea 10 was (44%). The reported incidence of rickets in prematurity varies widely from center to another 11, 12, since there is no general agreement on diagnostic criteria, it is impossible to certain how common the problem is. Reduced bone mineralization is almost universal in infants less than 1500gram, since they have poor calcium retention for several weeks after birth 13. It is found that risk of rickets in prematurity is inversely related to the infant’s birth weight and gestational age, and results obtained that osteopenia of prematurity occurs in 20-30% of preterm infants with birth weight below 1500 g and in 50-60% of preterm infants with birth weight below 1000 g. 2, 14.

Regarding gender variation, in this study male slightly more than female with no significant statistically, other studies showed the same results 2, 6, but no another study showed a significant variation in sex in rickets of prematurity.
Regarding type of feeding, in this study breast feeding babies are more frequently to develop rickets of prematurity than of that with bottle feeding. Another studies in UK and India showed the same results. studies showed that high-risk group of rickets of prematurity is made up of receiving unsupplemented breast milk. Despite the many documented benefits of breast milk for preterm, it just doesn’t have enough phosphate and calcium to support rapid bone growth. This is an important reason to use breast milk supplements.

In this study, the most age onset of presentation of rickets in prematurity was between 2 to 12 months. similar results was obtained in Nigeria, other researches demonstrate that the age of presentation of rickets in prematurity occur between 6 and 16 weeks age but may remain asymptomatic for weeks until overt rickets or fractures develop. Researches showed that in premature infants with gestational age under 32 week, bone mineral content was found to be 25% to 70% lower than term infants.

Regarding biochemical results, serum level of calcium was low in (11%) of cases, serum phosphate was low in (60%) of cases, serum alkaline phosphatase was high in (91%) of cases and serum vitamin D (25(OH) D ) was low in (31%) of cases.Nearly similar results were obtained in Hong Kong and Italy. Infants with rickets will demonstrate a normal serum calcium and a low or low normal serum phosphorus level. Infants with severe, prolonged osteopenia may demonstrate a low serum calcium level. In the majority of cases of rickets in preterm babies, 25 (OH)D levels are normal, but in opposite another study in Saudi Arabia demonstrate (75%) low level of vitamin D with rickets. Alkaline phosphatase levels are usually elevated in cases of active rickets, and some authors have suggested that serial measurements may be useful in predicting disease.

All the patients included in our study had some degree of radiological changes suggestion of rickets such as metaphysical Splaying, cupping, fraying, widening of epiphysial growth plate and poor mineralization of trabecular bone. The X-Rays is a very useful for early diagnosis as radiological abnormalities can be found before physical signs, however, screening test require both radiological and alkaline phpsphatase activity measurement to enable neonatologists minimize risk factors and optimize nutrition and mineral supplementation.

Conclusions

High number of cases of rickets occurs in prematurity, and mostly in ages between 2 and 12 months. Breast feeding is an important risk factor for the disease. Increase serum alkaline activity is an important test in diagnosis of rickets. Gender variation and residency was found to be statistically not a significant factors for this disease.

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REFERENCES


8. Palizade F Naderi; A Randomized Clinical Trial of Prophylactic Effects of Vitamin D on Different


Existence of Microorganisms on Home and its Impact of Human Life (Review)

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¹Department of Biology, College of Science, Mustansiriyah University, Iraq

ABSTRACT

It may be assessed that indeed up with 30% for edifices overall might be those subject from claiming objections associated with the personal satisfaction about indoor air. Possibility sources about air contamination camwood be both natural What’s more inorganic particles. Microorganisms enters under the edifices throughout those airing about rooms alternately through those distinctive slots Also might create on the surfaces about Different materials. Intensively develops over poorly ventilated, moist and dusty situations. To this motivation behind the introduction of the indoor air contamination might make stranger for occupants over the uncover of the impurities of the open air. This article keeps tabs for living air pollutants from existing What’s more dead living sources, particularly the individuals associated for growths. Growth’s discovered in the indoor air of Domesticated dwellings clinched alongside an expansive degree need aid comparable clinched alongside their species arrangement on the individuals found on the outside of the building.

Keywords: Microorganisms, contamination, Home, pollutants.

Introduction

Increasingly, there need aid reports about respiratory manifestations connected with staying. Previously, homes for stickiness issues and the vicinity about microorganisms around Different building materials [1]. Here we Additionally focuses crazy that poor indoor air caliber might cause word related sicknesses [2,3]. Individuals use give or take 90% about their available time inside their dwellings. In spite of it is hard should have confidence those purposes of presentation of the indoor air contamination could make stranger over those uncover of the impurities of the open air air [4,5]. The amount Also sort of pollutants suspended buzzing around determine the nature of this air. Possibility wellsprings from claiming air contamination might make both natural and inorganic particles. This article keeps tabs on living air pollutants Concerning illustration common pollutants from living and dead living wellsprings. The point when Intuition around living factors, microbes would meriting of consideration. Microorganisms enter of the inner part of the building from those outside, Yet what’s worth accentuating will be that inside there need aid real sources for advancement [6,7]. Again as far back as quite some time this issue need not diminished or Actually intensified, Likewise might a chance to be inferred from the most recent WHO report-WHO rules for indoor air quality: soddenness and shape. It is evaluated that indoor suddenness influence 10-50% about indoor situations over Europe, Furthermore in the different Exceptionally created nations [8]. To this reason, it may be justifiable that those species about parasite separated from the indoor air would in any event clinched alongside half indistinguishable twin with disengaged from diverse materials, dust, alternately starting with those surface of the dividers from claiming these rooms [9,10]. Spores alternately conidia Furthermore other structures for growths enter those human body to Different routes for every os, for every nasal alternately for every cutaneum [6,11,12]. Indoor microorganisms are display buzzing around Likewise In this way known as bioaerosol, they settle on different surfaces, might create to layers for condensed steam on the dividers Furthermore windows,
for sustenance remains, under carpets Furthermore with respect to whatever available clammy material. Especially useful earth to those improvemen about a number microorganisms is home tidy [13,14].

Growths Furthermore hypersensitive responses: Unfavorable susceptibility with growths might make showed by: bronchial asthma, rhinitis, conjunctivitis, urticaria, or atopic dermatitis. Fungi, contingent upon the species, would fit with actuate every last one of four sorts from claiming excessive touchiness responses [15,16]. Vicinity of growths done household dwellings frequently may be connected with hypersensitive reactions [6,17]. Around every last one of portrayed sorts about hypersensitive responses created Eventually Tom’s perusing growths of the the vast majority basic belongs excessive touchiness of the sort. I - quick reaction, IgE-dependent. This sort from claiming safe reaction may be likewise called anaphylactic Also clinically is showed Concerning illustration asthma, rhinitis, sinusitis, urticarial, swollen vascular alternately obscuration from claiming bronchi. In this body of evidence contagious allergens actuate igg creation which opsonized massorete units What’s more basophiles [15,18]. Clinically, kind iv for excessive touchiness responses might a chance to be showed by contact dermatitis alternately urticarial. Additionally portrayed would granulomatous instances with trademark in lamasery in filtrates [19]. Contagious spores over a few little amounts would characteristic Furthermore ordinarily found On both indoor and open air air. For powerless individuals, however, they might produce Different hypersensitive responses [20]. Contagious antigen skilled will actuate this sort for response will be practically usually mannan, basically discovered done Mobile dividers of the class aspergillus Also open Polaroid. These need aid cytotoxic responses -dependent principally from igigi and ignite jan paderewski antibodies alternately units such cytotoxic lymphocytes, characteristic slayer (NK) cells, alternately actuated macrophages controlled to antigen which is inserted with respect to platelets or constitutes a part from cell layer [21]. Molds would those mossycup oak as a relatable point over summer, Also starting with september to november those issue bit by bit declines. Those reason for overwhelming exacerbations from claiming bronchial asthma in the late midyear would see clinched alongside secondary focuses for spores of the class Alternaria and Cladosporium toward this time. It will be accepted that growths from the request of mucorales Also starting with Penicillium, aspergillus alternately Trichoderma class might assume a comparative part [22]. Normally side effects show up after10-30 minutes then afterward contact for allergen. Sort ii responses are lesquerella incessant. This kind of hypersensitive response may be as a rule connected with safe complexes comprising from claiming contagious antigens Also antibodies. Such complexes would framed Toward the vicinity of little sums from claiming parasite in the form (in the body of evidence about APBA) or repeater introduction on little conidia such these framed by aspergillus fumigatus which attained best 2-3. 5 microns [23,24].

This parasite postures An risk not best due to the plausibility for making hypersensitive reactions, as well as due to the a lot of Different unstable natural mixes (VOCs) discharged Throughout the animated development and also In the period from claiming passing for its fruiting figures. On the other hand, because of its solid cellulosic Also lignolytic properties, this parasite is hazardous for building materials [25]. Mold-induced hypersensitive responses are regularly comparative will the individuals connected with in lumens. It doesn’t is concerned that some molds would classified Concerning illustration pathogenic and the others as non-pathogenic. Both aggregations need aid hazardous with human wellbeing [26]. The A large portion normal protests connected with exposures to mold allergens are: runny nose, conjunctivitis, cough, upper respiratory tract congestion, midsection torment alternately urticaria. Allergenic growths might also improve the indications Previously, patients with atopic dermatitis, in patients with hypersensitive alveolar alveoli alternately for bronchial pneumonin [26,27].

Growths Similarly as makers about unstable mixes: It is great referred to that growths camwood emit a considerable measure from claiming unstable natural exacerbates (VOCs),which are a standout amongst a significant number items about their elementary alternately optional digestion system [28,29]. Those indications connected with discharged by growths VOC those the vast majority often would showed Eventually Tom’s perusing absence of comfort, headaches, eye torment pharyngitis, dry cough, dizziness, smeared vision, difficulty to concentration, affectability will smell, fatigue, apathy, or much An more terrific inclination with colds. These mostly neurotoxic indications need aid
improved for a higher centralization about bio aerosol On indoor air [36]. It is trademark that following taking off such An building alternately An room, these indications Typically vanish rapidly [38,39]. Those emission for these compound mixes may be also specifically related with a ailing unit which will be called ailing fabricating syndrome (SBS). Emission from claiming unstable substances and also handling of a colossal sums about extracellular polysaccharides (EPS) happens particularly At the molds grows over shut rooms, poorly ventilated with a secondary relative moistness [31]. It may be great known that growths show more terrific metabolic action under higher relative moistness [21]. Such unsafe states could exist best On one room, in the entire artment alternately Indeed going in the entirety building, particularly In the last need been based for insufficient materials of the commonplace atmosphere in this locale. Around alcohol the The majority frequently all the need aid found 1-octanol, 2-octanol, methylbutanol or ethyllhexanol. Separated from alcohol, terpenes Also ketones are also frequently produced, for example, such that 2-pentanone 2-hexanone, 2-heptanone, 3-octanone, α-pinene, β-pinene, camphene, limonene, alternately methylfuranes. “around those fragrant hydrocarbons prepared Eventually Tom’s perusing growths those The greater part regularly need aid discovered cyclohexane and benzene. Those development from claiming growths inside these spaces may be constantly went with Eventually Tom’s perusing the discharge for carbon dioxide What’s more unstable natural mixes. Exacerbates discharged by growths have a place with such aggregations Similarly as fragrant and chlorinated hydrocarbons, alcohol, ketones, aldehydes or esters [12]. Not just growths bring the capacity to prepare MVOC. Such mixes might Additionally make prepared Toward microscopic organisms What’s more actinobacteria. A percentage compounds, for example, such that monoterpene, might Additionally originate from sure fabricating materials furniture, carpets Also other wellsprings [33]. It need also been indicated that generated Toward a lot of people species about growths formaldehyde and β-glucans demonstrates strongirritation impact to mucosal membranes [14].

Mycotoxins Similarly as items for auxiliary digestion system: Demonstrating to the antagonistic impacts from claiming growths exhibit in the regulate mankind’s environment, it may be unthinkable with disregard their poisonous impacts on the human body. For respect to human and creature health, those ordinarily known issue pose mycotoxins [35]. It may be irritating that Around those contagious number there need aid watched virulent strains that bring the possibility to expanded handling from claiming mycotoxins. This wonder might make related for those expanding utilization of plant security results (pesticides, fungicides), of which the mutagenic impact will be great known [36]. Mycotoxins need aid poisonous results from claiming auxiliary digestion system for molds. It may be accepted that these mixes need aid necessary Toward growths in their regular environment, Likewise A large portion for these substances need aid generated against different microorganisms (counting other species of fungi) Likewise a show fate of rival to biological corners [37,38]. Thus far, more than 400 separate mycotoxins have been depicted [39]. Mycotoxins might reason both intense What’s more Ceaseless issue Previously, people. With actuate intense inebriation which frequently all the winds with death, it is necessary with get a milligram dosage for every kilogram from claiming body weight [39,40]. On toxin Toward mycotoxins A large portion often hails through ingestion from claiming sustenance defiled for these mixes. However, taking under record the way that mycotoxins camwood amass in distinctive structures about mycelium and camwood diffuse under the society medium those grade mycotoxicosis camwood happen Indeed going Toward inward breath for spores conidia alternately pieces about mycelium. For example, Stachybotrys, chartarum produces mycotoxins which concentrated to conidia, phialides Furthermore conidiophores. An specific measure of these harmful exacerbates are Additionally discharged under the medium, particularly Throughout those sporulation time. An additional species, aspergillus flavus Furthermore aspergillus parasiticus produces mycotoxins which amass Previously, conidia and sclerotia [41].

Those significantly expanded frequency for tumor done people possess mildew covered rooms By and large may be undoubtedly related for long haul presentation with mycotoxins [40,42]. It will be accepted that tumor changes, particularly malignancy from claiming liver or kidney, might be Postponed impacts of long -term composition should low doses from claiming mycotoxins of the human body [37,41]. Around those The majority imperative and the A large portion usually encountered in the nature’s domain mycotoxins need aid included aflatoxins, ochratoxin A, zearalenone, trichothecenes
What’s more fumonisins [39]. Those first of the said shows up especially hazardous with people What’s more animals due to their cancer-causing properties because of those benzofuran ring [41]. The practically broadly conveyed in the earth makers of hazardous mycotoxins need aid various species of the class aspergillus. Large portions species starting with this genus, Furthermore specifically An. Fumigatus, a. flavus, a. Terreus, An. Niger, An. Clavatus Furthermore An. Chevalierii were separated starting with cellulose acetic acid derivation or collagen held materials [38,39]. Those mycotoxin creation itself and the force about this procedure rely on upon the contagious strain, Furthermore its genotype. It Additionally relies from its developmental stage, starting with those relative moistness What’s more temperature, Also starting with the concoction creation of the substrate, On which states that parasite grows. In the respect to those latter, the nature of the nitrogen wellspring assumes a especially paramount part for the lethal intensify processing [39]. Mycotoxins would transformed intensively toward higher temperatures Furthermore under those higher relative moistness and especially inside the dwellings with poor ventilation [42]. For example, the ideal temperature for the creation about aflatoxin may be 33°C. It need Additionally been found that under those a portion levels from claiming inorganic nitrogen, phosphates Also under the states about oxygen exhaustion What’s more raised carbon dioxide the preparation about this poison may be inhibited [40].

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REFERENCES


Mobile Phones Contaminated with Bacteria among Workers in Dental Clinics

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ABSTRACT

Unfortunately, cross infection in dental field is a critical issue that most commonly occurs via different ways. The possible transmitters are (dentists, students, workers, mobile phone and other dental instruments). thus, the aim of this study is to investigate the level of contamination by measuring the percentages and type of bacteria isolated by swabbing from different surface sites of (30) mobile phones devices of (dentists, students, and workers) in a hospital of Dentistry Faculty - Babylon university. Collection of swaps samples from (30) mobile phones of dental workers was conducted at University clinics and then transmitted to the laboratory of microbiology to evaluate their bacterial contamination levels. Both McFarland standard tubes and optical density methods were used for performing of bacterial quantification and the standard microbiological techniques were used for identification of the isolated bacterial agent. All of the investigated dental workers mobile devices have some degree of bacterial contamination (100%) either with single or mixed microbial agents. *S. epidermidis* having the higher chance of contamination (23.3%), (16.6%) *E. coli* and *Enterococcus fecalis* (20%) *Bacillus* spp., (10%) for *S. aureas*, (6.67%) *Pseudomonas* spp., (10%) *Streptococcus* spp., (3.33%) for each of *Salmonella* spp, *Klebsiella* spp., *Shigella* spp. and *Proteus* spp. respectively. The mean bacterial count was (1.5×10⁹) method. By using the surface spread method, the corresponding figures were an organisms/phone. Hand hygiene is very important in prevention mobiles contamination and suggestion of prevent using mobiles phones in side dental clinics units.

Keywords: Mobile phone, Bacterial contamination, hand hygiene

Introduction

The mobiles make life easier, but they pose a number of new hazards also (1). A vast number of microbes presents on the surfaces of the mobiles making them as a risk for human health (2). Our Mobiles can be considered as one of the necessities in our social and professional life today. As they are small and very useful during emergencies, they are the much preferred and most used routes of communication (3). Dental profession is no exception to cellphone use. Workers in dental field may exposed to many microorganisms exist in saliva and blood. Their cellular phones are rarely cleaned and they usually touch their phones without hand washing especially during and after finishing of the patient examination (3, 4). Infection control is one of the biggest challenges that facing the dental professionals, it is important risk factor for both the patient and dentist (5). However, microbial transmission in the dental field can occurs either directly from one person to another or indirectly, by contaminated tools and environmental surfaces that are not sterilized and disinfected regularly (6). Therefore, one of the most important ways of preventing the cross infection and dangerous diseases in dentistry is to increase awareness of dental workers about the scientific methods of disinfection and sterilization of dental equipment and devices dental offices (7).

Materials and Method

Sample Collection and Laboratory Diagnosis: The present study was done at the hospital of dentistry faculty of Babylon University. Random sampling of (30)
mobile phones from subject persons (students, workers and dentists) by swabbing determined five different sites in a measure (1 cm²) using a dry sterile cotton swabs and were put in (5ml) (BHIB) tube and incubated over-night at (37°C). The positive growth tubes were compared with the turbidity of different concentration of McFarland tube and were subjected to optical density measurement by spectrophotometer. The samples were analyzed in the laboratory of microbiology for culturing each sample on blood and macConkey agar and incubated under aerobic and an-aerobic condition for bacterial identification. For bacterial identification, purely isolated colonies were gram differentiated and after that biochemically distinguished by (urease, oxidase, coagulase, catalase, indol, TSI and MRVP) (8).

**Estimation Bacterial Counts:** Bacterial counts in area of (1cm²) of mobiles phones estimated using McFarland standard tubes (9, 10).

**Results**

From (30) different cellular mobile devices samples were collected in this study (students, workers and dentists) and were subjected to laboratory diagnosis the result revealed different percentages of bacteria (figure 1) show (23.3%) S. epidermidis, (16.6%) E. coli and Enterococcus fecalis (20%) Bacillus spp., (10%) for S. aureas, (6.67%) Pseudomonas spp., (10%) Strepococcus spp., (3.33%) for each of Salmonella spp., Klebsiella spp., Proteus spp., and Shigella spp.

The Quantity of bacterial contamination was estimated using McFarland standard tubes, the mean of bacteria was (1.5×10⁹).

**Discussion**

Mobile phones may be considered a source of infections because of their own temperament and nearness to touchy piece of our bodies, for example, faces, ears, lips and hands. Using of mobiles is highly prevalent among medical and dental workers, playing a significant role and positively affect their communication abilities. However; this referred only to technical point of view and have no consideration of their possible role in infection transmission. Preventing of infection transmission in is a critical issue in dental profession, because of the infectious diseases can be easily transmitted in dental environment (11).

The mobiles are usually carried by their owners in all places, and considering that the human’s hand and environments like kitchen, hospital, and toilet have a large number of microbes such as potentially pathogenic bacteria, so the mobiles can be also considered as a major device of transmitting disease in the community (12).
Cellular phones due to their high temperature and moisture content of the operatory becomes suitable surface for microbial growth. The results of this study revealed that different contamination ratio of the mobiles of (students, dentists, and workers) in a hospital of dentistry faculty of Babylon University, but the highest level were showed in Staphylococcus epidermidis (23.3%) (Figure 1) The high isolation percent of Staphylococcus epidermidis clarified that the source of most mobile phones contaminated bacteria are the skin\(^{(13)}\).

Another isolates of bacteria obtained from the samples of the present study are *E. coli*, *Enterococcus fæcalis* (16.6%) for each one, *proteus* spp.(3.33%), *Salmonella* spp.(3.33%) and *Shigella* spp.(3.33%) this is due to fecal contamination of these mobiles, which can result in community-acquired infection and disease outbreak \(^{(14)}\).

The spread of *Bacillus* spp. suggests the ubiquitous nature of *Bacillus* spp. giving it greater contamination of (students', workers, and dentists) mobile phones with different microbial isolates.

The results of our study showed (*Bacillus* spp. (20%), *S. aureas* (10%), *Klebsiella* spp., (3.33%) and *Pseudomonas* spp., (6.67%). This is due to the isolated bacteria are a subset of the normal skin microbiota as advanced by earlier researchers \(^{(15)}\).

The percentage of streptococcus spp. in our study was (10%). It was well known that Streptococcus species can cause illnesses such as meningitis, pneumonia, pharyngitis \(^{(16)}\).

The high level of bacterial agents that was isolated from mobiles was attributed to the poor hygienic and sanitary practices. However, the discrepancies showed among different studies might be due to the influence of sampling method, sample size and different laboratory processes \(^{(1)}\).

Result recorded high number of bacterial isolates found on the surface of mobiles \(1.5 \times 10^9\), these bacteria may cause infections if the conditions permit for finding its routs to the human body.

**Conclusion**

The mobile users are found in the market, hospitals, home, and schools. therefore, they can be considered as a major cause for spreading of infection in our community. According to bacterial isolates were obtained from mobile phones in the present study by culturing, staining, biochemical test and comparing the isolates with Macferland tubes and measure the optical density of its. Our study showed that mobiles would serve as vector for bacteria transmission among individuals. This proposes the capability of the mobile phones as a fomite, which can lead to community-acquired infections with possible public health implications. Periodic use of disinfectants or hand cleaning cleansers for cleaning of the mobiles and regular hand-washing ought to be supported as a method for shortening any potential disease transmission.

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**REFERENCES**


Molecular Detection of \textit{M. Pneumoniae} in Pneumonia Patients in Al-Hilla City, Iraq

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\textbf{ABSTRACT}

A total of 71 patients with pneumonia (49 males and 22 females) from various age amass from short of what one to fifteen years old (<1-15) were engaged with this examination and subjected for inspecting by throat swabs collected from outpatients and inpatient admitted to Babylon Maternity and Pediatrics Healing facility, amid the period from November to walk 2018. The period of patients ran from 1 to 15 years. The most influenced age gather was (6-15) years with 35:71 (49.29\%) patients. While in age gathering (1-5) year 20:71 out of a rate (23.16\%) and 11:71 as (15.49\%) trailed by 5:71 (7.04\%) in > 15 years of age. As to the conveyance of \textit{M. pneumoniae} as indicated by the sexual orientation, high contaminated individual with pneumonia (49) was identified in females in comparision with the male (22). Each example was submitted to intensification with PCR procedure. The consequences of gel electrophoresis for DNA groups in view of particular adhesin qualities (myco and MP-P1) for \textit{M. pneumoniae}, demonstrated that \textit{M. pneumoniae} was certain with sub-atomic length (144bp, 399bp) individually, The two qualities (myco and MP-P1) give indistinguishable recuperation rate for determination of \textit{M. pneumoniae} in 12:71 with a rate (16.9\%) and 59:71 indicated negative outcomes in a rate (83.09\%). In end \textit{M. pneumoniae} diseases in offspring of Al-Hilla area has a part in pneumonia contamination. Additionally PCR can be utilized as an affirmed test for fast distinguishing proof of Mycoplasma pneumoniae pneumonia in children. On the other hand Throat swabs could be supplanted by different examples like nasopharyngeal lavage for coordinate identification of \textit{M. pneumoniae} in respiratory emissions.

\textit{Keywords:} \textit{M. pneumoniae, pneumonia , PCR}

\textbf{Introduction}

The conclusion of \textit{M. pneumoniae} pneumonia still depends on established strategies for culture and serology, both of which neglect to meet the criteria of a suitable analytic test. \textit{Mycoplasma pneumoniae} isn’t a piece of the ordinary greenery of the respiratory tract. Disengagement in the throat, nasopharynx, and pleural liquid can is viewed as characteristic of disease. The way of life strategies are moderately uncaring, tedious, costly, work serious and restricting its value for routine purposes \textsuperscript{(1)}. Fast research center determination of \textit{M. pneumoniae} contamination would encourage the decision of suitable antimicrobial operators for treatment of intense respiratory tract diseases, prominently pneumonia. Albeit much consideration has been engaged to enhance the finding of community acquired pneumonia, the identification and conclusion of contaminations caused by \textit{M. pneumoniae} remains a significant problem \textsuperscript{(2)}. Polymerase chain response (PCR), a generally late method, has been connected for the touchy and particular identification of an assortment of irresistible operators including the Mycoplasma spp. \textsuperscript{(3)}. The identification of \textit{M. pneumoniae} DNA in throat swab examples by PCR has been observed to be an exceptionally delicate and particular demonstrative method for the finding of intense \textit{M. pneumoniae} contamination \textsuperscript{(4)}. Atomic systems connected straightforwardly to respiratory tract examples are these days broadly utilized for the quick finding of respiratory tract diseases; in this manner, getting an agent example from the patient from the genuine site of contamination is generally imperative.
Throat swabs and nasopharyngeal suction (NPAs) are the example composes regularly utilized for \textit{M. pneumoniae} PCR (5), therefore, the recognition of \textit{M. pneumoniae} DNA in throat swab examples by PCR may give an enhanced standard to the determination of intense \textit{M. pneumoniae} contamination (6). Affectability is hypothetically high; it can recognize a solitary life form when sanitized DNA is utilized and it doesn’t require suitable creatures. As indicated by (7), intensification based strategies can build affectability up to 95%. Quality targets utilized in different sorts of PCR tests for \textit{M. pneumoniae} incorporate 16S rRNA, P1 adhesin, ATPase operon quality and tuf quality, and redundant component repMp1 (6).

Materials and Method

Clinical samples were collected from outpatients and inpatient admitted to Babylon Maternity and Pediatrics Healing center, for the period from November 2017 to 2018. The investigation included 71 patients and subjected for testing. The age of patients extended from 1 to 15 years, throat swabs was put in 2ml P.B.S and put in an ice pack until be taken to the research facility for extraction of bacterial DNA.

Genomic DNA Extraction: In this examination, the gathered examples; throat swabs from patients were subjected to DNA extraction method as indicated by conventions suggested by producer (Geneaid/UK). The accomplished DNA was put away at 2-8°C for assist applications and handling. Preliminaries for myc quality and p1 quality were utilized for distinguishing proof of \textit{Mycoplasma pneumoniae} microscopic organisms, item size and enhancement condition were recorded in Table (1), intensification was done by Polymerase Chain Response, that was performed in an aggregate volume of 20μl as specified in Table (2).

Results and Discussion

Conveyance of Pneumonia Patients: This investigation was performed on 71 patients with pneumonia (49 guys and 22 females) from various age aggregate from short of what one to fifteen years old (1-15) (Figure 1). The most influenced age amass was (6-15) years with 35:71 (49.29 %) patients. While in age gathering (1-5) year 20:71 of every a rate (23.16%) and 11:71 as (15.49%) trailed by 5:71 (7.04%) in > 15 years of age.

Intense respiratory diseases (ARI) are a main source of bleakness and mortality in youngsters (9). Be that as it may, the exact the study of disease transmission about etiological specialists of ARI in creating nations remains inadequately characterized (10). The pervasiveness rate of youth ARI because of these pathogens is exceptionally factor starting with one nation then onto the next because of contrasts in seasons and geographic regions. This finding was as per investigation of (11), who detailed that, an expansion of atypical pneumonia in kids between multi month to 14 years of age. The commonness rate of youth ARI because of these pathogens is exceptionally factor starting with one nation then onto the next because of contrasts in seasons and geographic zones (12).

Molecular Detection in Patients with Pneumonia:

Each example was submitted to enhancement with, The aftereffects of gel electrophoresis for DNA groups in light of qualities particular (myco and MP-P1) adhesin qualities for \textit{M. pneumoniae}, demonstrated that \textit{M. pneumoniae} was certain with atomic length (144bp, 399bp) separately. The two qualities (myco and MP-P1) give indistinguishable recuperation rate for finding of \textit{M. pneumoniae} (figure 2, figure 3) in 12:71 with a rate (16.9%) and 59:71 demonstrated negative outcomes in a rate (83.09%) as appeared in table (3-1). Each one of those patients were clinically analyzed as pneumonia by pediatricians as indicated by chest-x-ray and clinical signs. These outcomes were more than the outcomes gotten by (13) who found that the inspiration rate of \textit{M. pneumoniae} was (10%) among 100 researched patients with bring down respiratory tract infections. In any case, the present outcomes were can’t help contradicting the past examinations directed by (14) whose found that (45.5%), (33%) of patients with pneumonia were conveying \textit{M. Pneumoniae}, had \textit{M. Pneumoniae} in throat swabs. On the other hand, In Perua, an investigation uncovered that \textit{M. Pneumoniae} was found in a rate of (25.19%) in nasopharyngeal examples. A study of disease transmission division revealed an expansion of C. Pneumoniae cases, perceiving this pathogen as the most incessant reason atypical pneumonia taken after by \textit{Mycoplasma pneumoniae}, it is known to be atypical pathogen in charge of pneumonia (15). In the most recent years, there is an expanding enthusiasm to comprehend this pathogen, since it has been distinguished as vital reason for grimness and mortality in youngsters. \textit{M. pneumoniae} pneumonia (MPP) happens around the world, and records for 10 ± 40% of all instances of
network procured pneumonia. Notwithstanding, The emotional drop in its location saw amid this examination proposes that the discovery of M. pneumoniae saw in earlier years was straightforwardly connected with its epidemiological example and the recurrence of location of respiratory pathogens differed from year to year (16).

Bacterial and viral coinfection in children with M. Pneumoniae pneumonia are a major issue that ought to be additionally considered; since co diseases are more typical in disjoin MPP and they likewise have a tendency to be more genuine expanding bleakness and hospitalization (17).

Late presentation of PCR has fortified extraordinary investigation of its utility in analysis of irresistible maladies. We report here the use of PCR in identification of M. pneumoniae in clinical examples. Some problems must be understood. These incorporate a meaning of the most appropriate groundworks and the degree to which they cause enhancement of successions from related and irrelevant life form. Distributed DNA groupings of the ATPase (myco) and P1 adhesin qualities were utilized in this investigation. The adhesins are probably fundamental for the pathogenicity of these creatures and particular for the living being to be identified (17).

Concerning the age gathering, table (4) demonstrated that the most influenced age was (6-15) years as 8:71 (11.26%), while 4:71 (5.63%) in age gathering (1-5) years in correlation with age bunches that no energy rates (0.0%) were found. These discoveries were not as much as the outcomes performed by (13), who found that the most influenced age assemble was 8-14 years with a rate (23.3%). M. pneumoniae needs cell divider, and it is exceptionally touchy to natural conditions. Subsequently, exchange of disease requires close contact, which is generally more incessant in more established kids, who gain the contamination in school or amid playing with other kids (18) found that the predominance of M. pneumoniae contamination in kids tends to increment as per age. M. pneumoniae can be found in all age gatherings, with higher pervasiveness in youngsters matured 5 ± 15 years of age (19,20). Studies led in different nations have demonstrated that Community acquired M. pneumoniae contamination influence principally preschool, school-matured kids and youthful grown-ups. Albeit, few investigations have revealed the recurrence of M. Pneumoniae and diseases in infants (21). A particular conclusion is imperative, since b-lactam anti-toxin treatment of contaminations because of these atypical pathogens is inadequate, while the utilization of anti-infection agents, for example, macrolides can uniquely decrease the span of the ailments (21).

Conclusion

In end M. pneumoniae diseases in Al-Hilla area has a part in pneumonia contamination. Additionally PCR can be utilized as an affirmed test for fast distinguishing proof of Mycoplasma pneumoniae pneumonia in children. On the other hand, throat swabs could be supplanted by different examples like nasopharyngeal lavage for coordinate identification of M. pneumoniae in respiratory emissions

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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Comparative Study on the Demographic, Clinical and Pathological Characteristics of Skin Basal Cell Carcinoma among Patients in Baghdad and Erbil

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1Al- Yarmook Teaching Hospital, Iraq; 2Ghazi Al-Hriri Hospital for Specialized Surgery, Iraq; 3College of Medicine, Hawler Medical University, Iraq; 4National Cancer Research Center, University of Baghdad, Iraq

ABSTRACT

Worldwide, skin cancer is a major public health burden as its incidence has been increasing over the past decades. Basal cell carcinoma (BCC) is the most common form of human cancer which is highly curative when diagnosed early.

One hundred eighty five lesions on the head and neck belonging to 140 patients who were suspected to have BCC by clinical examination in a dermatological consultation clinic of Al-Yarmook teaching hospital were compared to 170 lesions on the head and neck of 140 patients attending Erbil dermatology teaching center who were suspected to have BCC by dermatoscopic examination. More than one lesion was found in some patients. The excisional biopsies of these lesions were sent for histopathological study to confirm the diagnosis of BCC. The corresponding biopsy results were compared with the socio-demographic and clinical features of the two study settings.

No significant differences between the two study settings were noted concerning sex or smoking history. On the other hand, statistical differences were observed regarding residency, previous work and family history of skin cancer with p* value equivalent to (0.000), (0.003) and (0.000) respectively.

In both study settings patients had skin photo type III, displaying significant differences concerning clinical types. Nodular type was more common in Baghdad while ulcerative type was more evident in Erbil with P*= (0.005) and (0.000) respectively.

Sun exposure is an important risk factor for developing skin cancer specially in those resident in rural areas. Dermatoscopical examination of the skin proved to be a useful real time noninvasive visual aid in the diagnosis of BCC yielding a higher sensitivity for the diagnosis of BCC than that of clinical diagnosis.

Keywords: Basal cell carcinoma, Dermatoscopy, Histopathology

Introduction

Worldwide, skin cancer is a major public health burden as its incidence has been increasing over the past decades (1). According to the latest published Cancer Registry in Iraq, skin cancer is the ninth most commonly diagnosed malignancy among the Iraqi population (2). Basal cell carcinoma (BCC) is the most common form of human cancer which is highly curative when diagnosed early and can be readily treated with office-based therapy (3), Ultraviolet radiation from sun exposure intermittently plays as an important etiological factor in its pathogenesis (4). Other known risk factors for BCC are fair skin, sun burn, smoking and subjection to ionizing radiation (5). It usually does not metastasize, but sometimes if neglected by the patient it can distract the skin and invade underlying structures like bone, its growth in size can make the lesion inoperable especially on the face (5,6).
BCC is defined by World Health Organization Committee of the skin tumors as “a locally invasive, slowly spreading rarely metastasizing tumor, arising in the epidermis” \(^{(6,7)}\), it is also known as Rodent Ulcer. It rarely metastasizes when diagnosed and treated early \(^{(7,8)}\), however it could present late or even devastating if further neglected thus necessitating aggressive surgical approaches \(^{(9)}\).

Skin type is another important factor which could influence signal intensity \(^{(10)}\). In general, skin types are classified into six categories according to the Fitzpatrick scale as follows:

- Type I: always burns, never tans (palest; freckles).
- Type II: usually burns, tans minimally.
- Type III: sometimes mild burn, tans uniformly.
- Type IV: burns minimally, always tans well (moderate brown).
- Type V: very rarely burns, tans very easily (dark brown).
- Type VI: never burns (deeply pigmented dark brown to darkest brown) \(^{(10,11)}\).

Clinical variants of BCC include: Nodular, Ulcerated, Superficial Spreading, Infiltrative and Morphea form with pigmented and non pigmented sub classification for each one \(^{(12)}\).

The aim is to detect the association between socio-demographical picture, clinical and pathological characteristics of patients with BCC attending Al-Yarmook teaching hospital and those attending Erbil Dermatology Teaching Center and to compare the accuracy of diagnosis between the two study settings by comparing the methods of diagnosis and the reported biopsy results.

**Materials and Method**

A cross sectional study conducted among patients attending a dermatological consultation clinic in Al-Yarmook teaching hospital and Erbil dermatology teaching center from August 2017 to June 2018.

A hundred eighty five lesions on the head and neck belonging to 140 patients who were suspected to have BCC by clinical examination in a dermatological consultation clinic of Al-Yarmook teaching hospital were compared to 170 lesions on the head and neck of 140 patients attending Erbil dermatology teaching center who were suspected to have BCC by dermatoscopic examination. More than one lesion was found in some patients. The excisional biopsies of these lesions were sent for histopathological study to confirm the diagnosis of BCC. The corresponding biopsy results were compared with the socio-demographic and clinical features of the two study settings.

Chi square test was used, *P* values less or equivalent to 0.05 were considered significant.

**Results**

Concerning the socio-demographic characteristics in Al-Yarmook teaching hospital patients, 68 (69.3%) of them were males and 30 (30.7%) were females, their ages ranged between 37 to 72 years, with a mean of 66.5 ± 1.5 years. Seventy eight (79.6%) patients were rural areas resident while 20 (20.4%) patients were city residents and 59 (60.2%) of them previously worked as farmers. Smoking was predominant habit among them in 68 (69.3%) patients. Family history of skin cancers was positive in 35 (35.7%) patients.

Regarding Erbil dermatology teaching center patients, 83 (61.9%) of them were males and 51 (38.1%) were females, their ages ranged between 35 to 87 years, with a mean of 68.3 ± 1.5 years. Sixty three (47%) patients were rural areas resident while 71 (53%) patients were city residents and 83 (61.9%) of them previously worked as farmers, smoking was predominant habit among them in 93 (69.4%) patients. Family history of skin cancers was positive only in 14 (10.4%) patients.

A significant differences were noted concerning the residency, previous work and positive family history of skin cancer among patients in the two study settings with *p* values (0.000,0.00,0.000) respectively (Table 1).

**Table 1: Association of socio-demographic characteristics between two study settings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>AI-Yarmook teaching hospital patients (n = 98)</th>
<th>Erbil dermatology teaching center patients (n = 134)</th>
<th>p'-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>68</td>
<td>83</td>
<td>69.3</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>51</td>
<td>30.7</td>
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</table>

*P* = 0.000,0.00,0.000 respectively.
Conted…

<table>
<thead>
<tr>
<th></th>
<th>Age (mean ± SD) years</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>66.5 ± 1.5</td>
<td>68.3 ± 1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residency</td>
<td>Inside the city</td>
<td>20</td>
<td>71</td>
<td>52.9</td>
<td>0.000</td>
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<tr>
<td></td>
<td>Rural areas</td>
<td>78</td>
<td>63</td>
<td>47.1</td>
<td></td>
</tr>
<tr>
<td>Previous work (past 20 years)</td>
<td>Government officer</td>
<td>11</td>
<td>11.2</td>
<td>34</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td>Private work</td>
<td>16</td>
<td>8</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>59</td>
<td>83</td>
<td>61.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>12</td>
<td>9</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>Smoking history</td>
<td>Smoker</td>
<td>68</td>
<td>93</td>
<td>69.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non smoker</td>
<td>30</td>
<td>41</td>
<td>30.6</td>
<td></td>
</tr>
<tr>
<td>Family history of skin cancer</td>
<td>+ ve</td>
<td>35</td>
<td>14</td>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- ve</td>
<td>63</td>
<td>120</td>
<td>89.6</td>
<td></td>
</tr>
</tbody>
</table>

* Chi square test was used.

The patients’ skin photo type of Al-Yarmook teaching hospital according to Fitzpatrick’s classification was mainly type III 68 (69.3%) patients. Skin photo type II was observed in 23 (23.4%) patients, photo type IV in five (5.1%) patients and only two (2.2%) patients were of skin photo type I. On the other hand, in Erbil dermatology teaching center the patients’ skin photo type III was observed in 101 (75.3%) patients, photo type II in 19 (14.3%) patients, photo type IV in 12 (8.9%) patients and only two (1.5%) patients were of skin photo type I (Figure 1).

**Figure 1: Comparison between the two study settings concerning patients’ skin photo type according to Fitzpatrick’s classification**

The BCC tumors were classified according to their clinical types, in Al-Yarmook teaching hospital, the most frequent type was the nodular variant which found in 68 (52.7%) lesions. Morphea form was the least common one as it found only in 3 (2.3%) lesions. The BCC were generally and for each type clinically subdivided in to pigmented BCC (pBCC) and non-pigmented BCC (npBCC) which their proportions were (68.2%) and (31.7%) respectively, while in Erbil dermatology teaching center, the most frequent type was the ulcerated variant which found in 74 (45.4%) lesions. Morphea form also was the least common one as it found only in 7 (4.3%) lesions, pigmented BCC (pBCC) and non-pigmented BCC (npBCC) proportions were (65.5%) and (34.4%) respectively.
A significant difference between two study settings was noted in nodular and ulcerative types with P values of (0.005) and (0.000) respectively (Table 2).

**Table 2: Association of Clinical types of BCC and their sub-classification of pigmentation between the two study settings**

<table>
<thead>
<tr>
<th>Clinical Type</th>
<th>AI-Yarmook teaching hospital lesions (n = 129)</th>
<th>Erbil dermatology teaching center lesions (n = 163)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>pBCC</td>
<td>npBCC</td>
</tr>
<tr>
<td>Nodular</td>
<td>68</td>
<td>45(66.2%)</td>
<td>23(33.8%)</td>
</tr>
<tr>
<td>Ulcerated</td>
<td>31</td>
<td>28(90.3%)</td>
<td>3(9.7%)</td>
</tr>
<tr>
<td>Superficial spreading</td>
<td>18</td>
<td>8(44.5%)</td>
<td>10(55.5%)</td>
</tr>
<tr>
<td>Infiltrative</td>
<td>9</td>
<td>6(66.7%)</td>
<td>3(33.3%)</td>
</tr>
<tr>
<td>Morphea form</td>
<td>3</td>
<td>1(33.3%)</td>
<td>2(66.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
<td>88(68.2%)</td>
<td>41(31.7%)</td>
</tr>
</tbody>
</table>

* Chi square test was used, ** Fisher Exact test was used.

Concerning AI-Yarmook teaching hospital, 140 patients were examined with 185 skin lesions on the head and neck (more than one lesion in one patient). The diagnosis of BCC was suspected clinically, excisional biopsies done and the specimens were sent for histopathological study. Among those the diagnosis of BCC was confirmed in 129 (69.7%) lesions (Figure 2).

**Figure 2: Percentage of positive biopsies in clinically diagnosed patients at AI-Yarmook teaching hospital**

Comparing to the result of Erbil dermatology teaching center, 140 patients were examined with 170 skin lesions on the head and neck (more than one lesion in one patient). The diagnosis was suspected dermatoscopically to have BCC, excisional biopsies done and the specimens were sent for the histopathological study. The diagnosis of BCC was confirmed in 163 (95.8%) lesions.

**Discussion**

In the present work, a cross sectional study design was performed which has the advantages of being easily conducted and requiring less time (13). In both study settings males were more than females (69.3% and 61.9% in Baghdad and Erbil respectively). This can be due to more outdoor working and sun exposure or more smoking habits among males which can cause repeated trauma and burns to lips. That is consistent with the results of Abbas et al who found that 62.6% of their sample were males (14) with no significant differences noted between the two study settings.

In our study, the mean age of the study sample in Baghdad and Erbil was 66.5 ± 1.5 years and 68.3 ± 1.5 years respectively. Those were rather close to the findings reported by Janjua1 et al (17) where the mean age group of their sample was (61.3 ± 13.07 years), probably attributing that to the fact of the buildup of sun exposure over time.

The percentage of living in rural areas among patients with BCC in our two study settings, was 79.6% in Baghdad compared to only 47.1% in Erbil with highly significant differences (0.000). That might be explained by the differences in temperatures of rural areas between the North and centers of Iraq as a cumulative exposure to sunlight over years is necessary for tumor development (16) and this can probably highlight the significant differences between the two study settings concerning the history of previous work of the patients (0.003).

The lower frequency of BCC among Erbil rural inhabitants may be explained on the basis that rural patients regard initial lesions of BCC as a minor cosmetic
problem with insignificant impact on health and seek medical advice only when lesions become symptomatic or disfiguring. However, this comes in contrast to the result of Maia et al. (17).

A positive family history of skin cancer was demonstrated in 35 (35.7%) patients and 14 (10.4%) patients in Baghdad and Erbil centers respectively with very high significant differences between the two study settings (p value =0.000) (18, 19). Ahluwalia et al found that (40%) of their patients had a positive family history (20), while Abbas et al. (14) registered only (29.4%). Both could be attributed to genetic and environmental factors.

In both study settings, skin type III represented higher percentages (69.3%) and (75.3%) in Baghdad and Erbil respectively, while type I was the least common (2.2%) and (1.5%) in Baghdad and Erbil respectively, pigmentation of skin is considered a protective factor for skin cancer (5).

In our study, the following clinical types of the BCC were found: ulcerative, nodular, superficial spreading, infiltrative and morphea form. In Baghdad, the commonest type was nodular type which was seen in 68 (52.7%) of the lesions and this agree with the result of Lyubomir et al. who found that nodular basal cell carcinoma comprises about (80%) of the cases, while in Erbil the commonest type was ulcerative type which was seen in 74 (45.4%) of the lesions. This high proportion of ulcerative type could be due to the fear from ulcers that make the patient seek for medical help. Significant differences between nodular and ulcerative type among the two study settings was found with p value =0.005 and (0.000) respectively.

In Baghdad center, they adopted a clinical examination as a provisional diagnosis for BCC with sensitivity of 70% compared to 95.7% sensitivity of dermatoscopy provisional diagnosis that was adopted in Erbil center. Both centers depend on the result of biopsies as gold standard. Chi-square was significant at p* value =<0.05.

Conclusion

Sun exposure is an important risk factor for developing skin cancer specially in those resident in rural areas. Dermatoscopic examination of the skin proved to be a useful real time noninvasive visual aid in the diagnosis of BCC yielding a higher sensitivity for the diagnosis of BCC than that of clinical diagnosis. In the future, histopathological investigation of BCC lesions could be provided only to the control of the treatment.

Acknowledgement

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Molecular Study of Toxoplasmosis in Spontaneous Aborted Women in Thi-Qar Province, Iraq

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ABSTRACT

*Toxoplasma gondii* infection can be diagnosed with different methods. The most important one is a Polymerase Chain Reaction (PCR), which is used for the detection of *T. gondii* DNA. This method is simple, sensitive, reproducible, cost-effective, and used in a variety of clinical samples from animals or humans.

In this study a blood sample of 305 abortive women were collected from Bent AL-Huda and Al-Hussian Hospitals in Thi-Qar province from October 2017 till October 2018. Sample, which gave positive results (133) with ELISA test were used in PCR technique. DNA extraction of parasite was evaluated by using specific primers for *Toxoplasma gondii*, (193 bp, 580 bp, 399 bp).

The PCR results of aborted women showed that the Positive IgG was found in (34) sample 25.6%, IgM+ in (14) sample 10.53%, both IgM; IgG in (6) sample 4.51%. The high infection rate was found at age group (25-29), and the lowest at age group (30-34) years and according to residency rural (29%), and urban (47.6%). The positive PCR in first trimester was (39.62%), in second trimester was (47.36%), and the multiple abortion was 39%, while the single abortion 42%.

**Keyword:** *T. gondii*, PCR, Prevalence, aborted women, Thi-Qar

Introduction

Toxoplasmosis is a zoonotic disease, which has relevance to both veterinary and human medicine. The infection with *Toxoplasma gondii* is transmitted through the ingestion of row or under cooked meat or unwashed fruits or vegetable and can be transmitted congenitally from mother to fetus through placenta [1, 2].

The disease is transmitted from cat which is the definitive host to human by eating the under cooked meat or row meat [3]. It is consider as the important disease that infected the pregnant women [4]. If the pregnant acquired infection, the Tachyzoit will colonize in the tissue of placenta and then cross to fetus, which lead to miscarriages or sever damage to fetus [3].

The infected women before the pregnancy is still asymptomatic, it becomes active if the immunity of the pregnant women is impaired [6]. The risk of infection with toxoplasmosis depends on the period of pregnancy, if the women infected with toxoplasmosis during the first trimester of pregnant, it`s cause spontaneous miscarriage of fetus [5, 8] with severe damage. In second and third trimester of pregnancy, the transmission of infection to fetus is more than first trimester with low effect on fetus [9].

*Toxoplasma gondii* infection can be diagnosed with different methods. The molecular methods includes the PCR which is used for the detection of *T. gondii* DNA, this method is simple, sensitive, reproducible and cost-effective and used a variety of clinical samples from animals or humans.

Materials and Method

The blood samples were collected from 305 abortive women in Bent AL-Huda and Al-Habboby Hospital in Thi-Qar province during the period from October 2017-October 2018.
Five ml of blood were collected from each aborted women. Three ml were used in serological tests and the 2ml of blood was put in EDTA tube for DNA extraction.

The DNA was extracted from the whole blood samples by using (DNA extraction kit, Genaid - USA). The extraction was performed according to the manufacturer’s instructions. The extracted DNA was amplify with Polymerase Chain Reaction (PCR) using specific primers (Table 1) and following the program mentioned in Table (2).

Table 1: Primers used in this study

<table>
<thead>
<tr>
<th>Primers</th>
<th>F: 5- GGA ACT GCA TCC GTT CAT GAG -3</th>
<th>R: 5- TCT TTA AAG CGT TCG TGG TC -3</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>193 bp</td>
<td>399 bp</td>
</tr>
</tbody>
</table>

Table 2: DNA amplification in thermocycler program

<table>
<thead>
<tr>
<th>Steps</th>
<th>Temp</th>
<th>Time</th>
<th>Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial denaturation</td>
<td>95 °C</td>
<td>5 minute</td>
<td>1</td>
</tr>
<tr>
<td>Denaturation</td>
<td>95 °C</td>
<td>15 sec</td>
<td></td>
</tr>
<tr>
<td>Annealing</td>
<td>52 °C</td>
<td>25 sec</td>
<td>42</td>
</tr>
<tr>
<td>Extension</td>
<td>72 °C</td>
<td>25 sec</td>
<td></td>
</tr>
<tr>
<td>Finale extension</td>
<td>72 °C</td>
<td>1 minute</td>
<td>1</td>
</tr>
</tbody>
</table>

The DNA product run in Agarose gel 1.5% to check for the specific band.

Results

Prevalence infection of toxoplasmosis in abortive women using PCR technique.

1. According to the age and antibodies: The total percentage positive PCR in aborted women was 40.6% while the negative PCR was 59.4%. No positive PCR result was detected in normal control samples of women, while the negative PCR of control samples was 100%.

The high percentage of positive PCR 53.13% was found at age group 25-29 year, while the lowest 33.3% was found at age 30-34 year. The high percentage of negative PCR 66.7% was found at age group 30-34 while the lowest 46.87% at age group 25-29 years.

The high total percentage 53.13% of positive antibodies of *Toxoplasma* at age group 25-29 year. The lowest 33.3 % at age group (30-34). The high percentage of positive IgM+, IgG+ and (IgM+; IgG+) were 18.75%, 37.5% and 7.7% at age (25-29, >40,15-19) respectively (Table 3).

Table 3: The percentage of *T. gondii* antibodies in PCR Technique according to age groups

<table>
<thead>
<tr>
<th>Age groups</th>
<th>IgG+</th>
<th>IgM+</th>
<th>IgG+ &amp; IgM+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>15-19 n = 13</td>
<td>3</td>
<td>23.07</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>20-24 n = 39</td>
<td>6a</td>
<td>15.4</td>
<td>6a</td>
<td>15.4</td>
</tr>
<tr>
<td>25-29 n = 32</td>
<td>10a</td>
<td>31.3</td>
<td>6b</td>
<td>18.7</td>
</tr>
<tr>
<td>30-34 n = 27</td>
<td>7</td>
<td>26</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>35-39 n = 14</td>
<td>5</td>
<td>35.7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Statistics:

- $X^2=1$ DF=2 P ≤ 0.60
- $X^2=7$ DF=1 P ≤ 0.008
- $X^2=3$ DF=1 P ≤ 0.09
- $X^2=1$ DF=1 P ≤ 1
Conted…

<table>
<thead>
<tr>
<th>&gt;40 n = 8</th>
<th>3</th>
<th>37.5</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>3</th>
<th>37.5</th>
<th>X²=1 DF=1 P ≤ 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total n = 133</td>
<td>34</td>
<td>25.6</td>
<td>14</td>
<td>10.5</td>
<td>6</td>
<td>4.51</td>
<td>54</td>
<td>40.6</td>
<td>X²=23 DF= 2 P ≤ 0.001</td>
</tr>
</tbody>
</table>

Statistics

The difference in small letters referred to significant differences between the values.

- Means significant differences

2. **According to miscarriage**: Table 4. Show the high percentage of positive PCR (42%) of aborted women was found in the single aborted women. The lowest 39% at multiple abortive, while the high percentage of negative PCR 61% in multi aborted, and the lowest value was 58% at single aborted.

Table 4: Percentage infection of toxoplasmosis according to single or multiple aborted by PCR.

<table>
<thead>
<tr>
<th>Abortion number</th>
<th>PCR+ve</th>
<th>PCR-ve</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Single n=74</td>
<td>31</td>
<td>42</td>
<td>43</td>
</tr>
<tr>
<td>Multi n=59</td>
<td>23</td>
<td>39</td>
<td>36</td>
</tr>
<tr>
<td>Total n=133</td>
<td>54</td>
<td>41</td>
<td>79</td>
</tr>
</tbody>
</table>

3. **According to trimester**: Table 5 show the high percentage of PCR positive in second trimester 47.36%, and the lowest percentage in third trimester 37.5%.

Table 5: The seroprevalence of toxoplasmosis in aborted women according to the trimester

<table>
<thead>
<tr>
<th>Time</th>
<th>Positive PCR</th>
<th>Negative PCR</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>1st=106</td>
<td>42</td>
<td>39.62</td>
<td>64</td>
</tr>
<tr>
<td>2nd=19</td>
<td>9</td>
<td>47.36</td>
<td>10</td>
</tr>
<tr>
<td>3rd=8</td>
<td>3</td>
<td>37.5</td>
<td>5</td>
</tr>
<tr>
<td>Total=133</td>
<td>54</td>
<td>40.6</td>
<td>79</td>
</tr>
</tbody>
</table>

4. **According to the residency**: The high percentage of positive PCR 47.6% was found at urban area while the lowest percentage 29%at rural area. The high percentage of negative PCR 71% at rural area and lowest 52.4% at urban area (Table 6).

Table 6: Percentage infection of toxoplasmosis according to the residency women by using (PCR)

<table>
<thead>
<tr>
<th>Residency</th>
<th>PCR +ve</th>
<th>PCR -ve</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Urban n=82</td>
<td>39</td>
<td>47.6</td>
<td>43</td>
</tr>
<tr>
<td>Rural n=51</td>
<td>15</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>Total n=133</td>
<td>54</td>
<td>40.6</td>
<td>79</td>
</tr>
</tbody>
</table>

Statistics

No positive PCR result was detected in normal control samples of women, while the negative PCR of control samples was 100%.
Figures (1,2,3) show the PCR amplification of *T. gondii* 193bp, 399bp fragments gene in 1.5% agarose gel of aborted women samples.

**Figure 1:** PCR amplification of *T. gondii*, 193 bp fragment gene in 1.5% agarose gel, of aborted women samples. M = ladder. Lane 1 = Positive IgM. Lane 2, 3 = Aborted women negative PCR. Lane 4, 5, 6, 7 = Normal women without abortion negative PCR.

**Figure 2:** PCR amplification of *T. gondii*, 193 bp fragment gene in 1.5% agarose gel, of aborted women samples. M = ladder. NC = negative control. Lane 1, 2-5, 10-13 = positive PCR. Lane 6, 7, 8, 9 = negative PCR.

**Figure 3:** PCR amplification of *T. gondii*, 399 bp, fragment gene in 1.5% agarose gel, of aborted women samples. M = ladder. NC = negative control. Lane 1-14 = positive PCR.
Discussion

The study shows a significant difference between negative and positive PCR according to age groups. The high ratio of infection 53.13% in age group (25-29), and low ratio 33.3% that was recorded in (30-34) years, agree with Shahab study in Babylon province who showed the high rate of infection in age group (22-29) [10], but it is not agree with Al-Adlaan study in Thi-Qar province who mentioned the higher ratio of PCR 29.41% in age group (21-25) [11]. The reason for this high ratio may be due to the high concentration of IgM during the first infection (1-2) weeks and may be due to the rapidly transformed the T. gondii from tachyzito to bardyzoit stage in tissue, which decreased it concentration in blood and raised up the IgG concentration.

Testing 133 samples of aborted women with Polymerase Chain Reaction (PCR) technique in this study gave 54% positive samples (40.6%).

Positive IgG samples gave percentage (25.6%), the IgM (10.53%), while the (IgG and IgM) (4.51%). The IgG shows high ratio 37.5% in age group 40 years, while the IgM, and both (IgG and IgM) show the higher ratio (18.75%, 7.7%) in age group (25-29, 15-19) years respectively. This result is in consist with Al-Gazy study in Thi-Qar province [12] which showed that the high IgG ratio was found in (40 years) which referred to past infection. The result of study also agree with Souhiella study who showed the ratio of IgG is more than IgM (31.57%, 26.31%) [13], and also agree with Laila study in Jordan who found the IgG in 76 sample of aborted women (51.3%), and the IgM in 4 sample was (2.7%) [14] and agree with Odile study who showed the result of IgG (89%), while IgM (10.2%) [15]. But not agree with Behzad in Iran who tested 109 aborted women and show the same result between IgG and IgM [16].

The highest rate of infection found in single aborted women (42%). This result is not agree with Al-Gazy study in The-Qar province who found the women with multiple abortion was more than single aborted women while Shahab shows the high ratio was found in a single abortion [10], but without significant difference between the toxoplasmosis and the number of abortion [11]. This result agree with [15] who showed the single abortion is higher than multiple abortion (50%, 6.3%)

The recurrent abortion may be due to the past infection which is not recovery or the abortion women don’t take the specific medication or due to the immune compromise of pregnant women.

The high prevalence of toxoplasmosis at second trimester and third trimester is not agree with Hadi study in Al-Qadisia province who showed the high ratio of first trimester period is more than other periods (63.6%, 55.6%) respectively [17], and also not consistent with the study in Diyala by Al-Ghurairy who showed that the women in second trimester is more than first [18]. This corresponding with fact that the injury in pregnancy depend on the degree of fetus resistant, the fetus more vulnerable to infection during first trimester due to immune system is not complete.

The total percentage of positive PCR in rural and urban area was (29%, 47.6%) respectively. Al-Jumali in Babylon found the ratio of infection of urban and rural was (37.5, 14.3) respectively [19], Al-Mammamuri found 80.9% in urban and 66.7% in rural [20]. The present result was disagree with Shahab study who showed the higher result in urban area more than rural area (67.8%, 66.1%) respectively [10]. Al-Dory in Salah Al-Din city showed that the aborted women in rural area is more than urban [21], while Hassan in Karbala city showed there’s no relationship between resident location of patient and percent of infection [22].

Conclusion

There is a significant difference between negative and positive PCR according to age groups. High IgG ratio was found in (40 years) which referred to past infection. The recurrent abortion may be due to the past infection which is not recovery or the abortion women don’t take the specific medication or due to the immune compromise of pregnant women. Urban areas showed higher PCR positive resuls.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Source of Funding: Self-funding

REFERENCES


Serum Interleukin-4 Level Correlation with Age and Fasting Blood Sugar in Iraqi Major Depressed Patients

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¹Pathological Analysis Department, College of Health and Medical, Al-Kafeel University, Najaf, Iraq

ABSTRACT

MDD is a common condition that affects the general population across a broad spectrum of ages and social backgrounds. It has been associated with inflammatory processes, including increased cytokine levels. High co-morbidity exists between MDD and chronic diseases like IR and Type 2 diabetes. Nevertheless, the correlation between among cytokines especially IL-4 and IR parameters have not been concentrated widely in MDD. In the present study, we measured IL-4 as anti-inflammatory marker, insulin and glucose as FBS, HOMA2%IR, HOMA2%S, HOMA2%B parameters in 60 MDD patients and 40 healthy controls. Associations between cytokine levels and IR were examined. IL-4, insulin, HOMA2%B, HOMA2%S and insulin resistance (HOMA2IR) increased significantly (p<0.05) in serum of MDD patients, in comareson with healthy controls. There is a significant correlation between FBS with IL-4 (p<0.05).

The current study introduce more confirms that major depressive patients is accompanied by activation of the immune system with significant elevations in the levels of IL-4 cytokine. These results indicate stimulation of the immune system and increased IR and modulation of IR by increased cytokine levels in MDD. The homeostatic model assessment beta-cell function (HOMA2%B) and (HOMA2%S) is strongly correlated with insulin resistance level (HOMA IR) in MDD patients.

Keywords: Major depressive disorder, Interlukin-4, Insulin resistance, Homeostasis model assessment.

Introduction

On of the main diseases with high lifetime prevalence rates is the major depressive disorder (MDD) which is a heterogeneous disease [1,2]. Clinical examination is the main method for MDD diagnosis with no biomarker available for any psychiatric disorder [3-5].

In the last decade, there is a growing interest in the role of cytokines in the pathogenesis of various psychiatric disorders, such as MDD. In case of systemic infections, cancer or autoimmune diseases, these cytokines can act on the brain to induce sickness behavior, leading to depressive symptoms development [6]. Cytokines affect brain function including behavior and play an important role in MDD and immune system dysregulation connection [7-11].

IL-4 is directly induce naive T cells differentiation to Th2 cells [12,13]. As MDD is associated with Th1 immune response and low IL4 expression, it receives more interest [14].

Insulin resistance (IR), Type 2 diabetes and cardiovascular diseases are believed to be positively correlated with depression [15,16].

Depression is inversely associated with insulin resistance, but positively associated with diabetes. However, the relation between insulin resistance and depression is poorly studied with conflicted results [17,18].

We have postulated that IR is part of the pathophysiology of affective disorders, and its improvement (via pharmacological or non-
pharmacological treatments) may reduce the severity of depression significantly \cite{19-22}.

The present work aims to explore the possible immunological changes that accompany MDD. To accomplish this goal, Interlukine-4 were measured in MDD patients and controls, Male-Female MDD patients and Smoking-Nonsmoking MDD patients. The second aim is to investigate whether glucose metabolism and insulin sensitivity were impaired in the MDD patients and estimate the correlations between this immune markers of MDD and IR.

**Materials and Method**

**Participants:** A total of sixty MDD patients (32 male and 28 female) and forty normal controls (24 male and 16 female) participated in the present study. Patients were recruited at the Psychiatry Unit, Al-Hakeem General Hospital, Najaf Governorate, Iraq and at a private psychiatric clinic during the period from April-November 2018. The patients were diagnosed for MDD by a psychiatrist based on (ICD-10 codes: F30-33). All patients were on a steady-state citalopram treatment (20mg daily) during the last few weeks.

Patients and controls were evaluated through a complete medical history to exclude any systemic diseases that may affect the biomarkers, including diabetes mellitus, liver and kidney diseases, (auto) immune disorders and neurological disorders, including multiple sclerosis, stroke and Parkinson’s disorder. Exclusion criteria for participants were any systemic or inflammatory disease. C-reactive protein (CRP) was not higher than 6mg/L, excluding subjects with overt inflammation.

About 5ml of venous blood were collected and left to clot and serum was collected by centrifugation at 3000rpm for 5 minutes. Serum was distributed into three Eppindroff tubes until assay. Venous blood samples were taken from the participants in the morning after at least 12 hours of fasting. Serum cytokines and insulin concentrations were measured using ELISA (BioAssay Systems®, USA).

**Statistical Analysis:** SPSS software was used for all data analysis. Pooled t-test used to compare between the groups. Statistical significance was considered when p<0.05.

**Result and Discussion**

**Comparison of the baseline biomarkers between MDD patients and controls:** Table 1 shows the socio-demographic, clinical and biomarker data of the participants in this study. In this table we examine differences in these variables between major depressed patients at baseline and healthy controls, were no significant differences in sex, age, BMI, smoking habit and FBS between the study groups. IL-4, Insulin, HOMA 2%B, HOMA2% S and HOMA 2%IR are significantly higher (P=0.000, P=0.028, P=0.043, P=0.038 and P=0.035 respectively) in the major depression group as compared with healthy controls.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>(mean ± SD) Controls</th>
<th>(Mean ± SD) Patients</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M/F)</td>
<td>18(12)</td>
<td>32(28)</td>
<td>0.138</td>
</tr>
<tr>
<td>Age</td>
<td>34.82 ± 12.386</td>
<td>31.73 ± 10.024</td>
<td>0.231</td>
</tr>
<tr>
<td>BMI</td>
<td>27.3409 ± 5.84265</td>
<td>27.9103 ± 6.06821</td>
<td>0.672</td>
</tr>
<tr>
<td>Smoking (Y/N)</td>
<td>6(30)</td>
<td>12(48)</td>
<td>0.547</td>
</tr>
<tr>
<td>IL-4</td>
<td>290.1609 ± 179.86837</td>
<td>454.9246 ± 206.22614</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Insulin ulU/ml</td>
<td>11.6497 ± 2.64151</td>
<td>10.3389 ± 2.48313</td>
<td>0.028</td>
</tr>
<tr>
<td>FBS mmol</td>
<td>5.8019 ± 0.48191</td>
<td>5.9135 ± 0.71335</td>
<td>0.442</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>97.4093 ± 23.50440</td>
<td>87.2822 ± 21.29927</td>
<td>0.043</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>66.8590 ± 20.05246</td>
<td>76.0545 ± 19.32174</td>
<td>0.038</td>
</tr>
<tr>
<td>HOMA2 IR</td>
<td>1.9649 ± 0.43739</td>
<td>1.7556 ± 0.42358</td>
<td>0.035</td>
</tr>
</tbody>
</table>
Serum IL-4 found significantly high in MDD patients. This result agree with Pavon et al. [23] while it has been found with no significant change by [24,25] or significantly in lower level [26]. This might be due to many factors like patient diagnosis criteria. IL-4 is strongly expressed during brain infection or injury and anti-inflammatory cytokines suppress the expression of IL-1, TNF, and other cytokines [27,28].

IL-4 may be a player in the regulation of depressive-like behaviors in untreated baseline conditions [29]. This is important as IL-4 has compensatory immune regulatory effects attenuating the immune-inflammatory response [30]. Moreover, IL-4 has wakefulness-promoting effects [31] and is increased in men with insomnia as compared with those without insomnia [32].

Hyperglycemia and hyperinsulinemia may alter hypothalamic-pituitary-adrenal (HPA) axis function and as a result it might cause depression [33].

The significant increase in HOMA2IR index in MDD patients as compared with controls indicates a state of IR. [34] IR has a close association to the metabolic syndrome component [35]. Glucose transport is inhibited because high cortisol increase the fat cells quantity and lipid breakdown which release free fatty acids into the bloodstream and constricts blood vessels [36] leading to obesity, IR, cardiovascular diseases and depression [37].

No significant differences in the biomarkers between male and female subjects with the exception of BMI and smoking habit (p=0.018 and p=0.016 respectively) (Table 2).

Table 2: Comparison between MDD patients

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male (N=32)</th>
<th>Female (N=28)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>31.42 ± 10.181</td>
<td>32.20 ± 10.019</td>
<td>0.789</td>
</tr>
<tr>
<td>BMI</td>
<td>26.13 ± 4.55</td>
<td>29.93 ± 6.97</td>
<td>0.018</td>
</tr>
<tr>
<td>IL-4</td>
<td>475.69 ± 227.43</td>
<td>431.18 ± 180.13</td>
<td>0.409</td>
</tr>
<tr>
<td>Insulin uIU/ml</td>
<td>10.15 ± 2.50</td>
<td>10.55 ± 2.48</td>
<td>0.540</td>
</tr>
<tr>
<td>FBS mmol</td>
<td>5.83 ± 0.76</td>
<td>6 ± 0.65</td>
<td>0.366</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>88.42 ± 22.49</td>
<td>85.98 ± 20.17</td>
<td>0.662</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>77.72 ± 19.55</td>
<td>74.14 ± 19.22</td>
<td>0.478</td>
</tr>
<tr>
<td>HOMA2 IR</td>
<td>1.71 ± 0.41</td>
<td>1.8 ± 0.43</td>
<td>0.451</td>
</tr>
</tbody>
</table>

Gender differences in depression is getting much concern lately because of lack of data and women exclusion from clinical trials [38]. Anxiety and eating are the most common comorbid disorders in women [39]. While men have higher rates of alcohol and drug abuse comorbid [40]. Smoking-induced oxidative stress that generates free radicals causing tissue damage [41]. Depression has been characterized by elevated oxidative stress that is in positive correlation with depression severity which can be corrected with treatment [42-44].

Table 3 shows that IL-4 in smoking MDD patients is higher significantly than in those of nonsmoking, while the other parameter are non-significantly indicating that the increased levels in these biomarkers in MDD are not attributable to smoking.

Table 3: Comparison between smokers and non-smokers MDD Patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Smoking (N=48)</th>
<th>Non Smoking (N=12)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>31.22 ± 7.03</td>
<td>31.83 ± 10.62</td>
<td>0.870</td>
</tr>
<tr>
<td>BMI</td>
<td>27.29 ± 5.57</td>
<td>28.06 ± 6.23</td>
<td>0.696</td>
</tr>
<tr>
<td>IL-4</td>
<td>605.31 ± 205.13</td>
<td>417.32 ± 190.58</td>
<td>0.004</td>
</tr>
<tr>
<td>Insulin uIU/ml</td>
<td>10.84 ± 2.91</td>
<td>10.21 ± 2.38</td>
<td>0.436</td>
</tr>
<tr>
<td>FBS mmol</td>
<td>5.87 ± 0.99</td>
<td>5.92 ± 0.63</td>
<td>0.855</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>91.84 ± 25.71</td>
<td>86.14 ± 20.2</td>
<td>0.412</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>74.15 ± 24.17</td>
<td>76.53 ± 18.18</td>
<td>0.706</td>
</tr>
<tr>
<td>HOMA2 IR</td>
<td>1.83 ± 0.48</td>
<td>1.73 ± 0.41</td>
<td>0.494</td>
</tr>
</tbody>
</table>
Numerous studies have confirmed that smokers do have a lower body mass index (BMI) than non-smokers\(^{45-46}\).

Smoking has been found associated with pro-inflammatory cytokines increased levels similar to depressed patients with high level of CRP, IL-6 and TNF–α and even higher with depressed smokers\(^{47-49}\).

**Correlations between Biomarkers:** Table 4 illustrate the correlation between study biomarker were found a significant correlation between immune marker IL-4 and age, also significant correlation between insulin and FBS with IR.

**Table 4: Correlation between study variables in MDD Patients**

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>BMI</th>
<th>IL-4</th>
<th>Insulin</th>
<th>FBS</th>
<th>HOMA2%B</th>
<th>HOMA2%S</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>ρ</td>
<td>0.371**</td>
<td>P</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IL-4</td>
<td>ρ</td>
<td>0.353**</td>
<td>P</td>
<td>0.008</td>
<td>0.389</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulin</td>
<td>ρ</td>
<td>-0.006</td>
<td>P</td>
<td>0.967</td>
<td>0.106</td>
<td>0.645</td>
<td></td>
</tr>
<tr>
<td>FBS</td>
<td>ρ</td>
<td>-0.008</td>
<td>P</td>
<td>0.954</td>
<td>0.248</td>
<td>0.041*</td>
<td>0.655</td>
</tr>
<tr>
<td>HOMA2%B</td>
<td>ρ</td>
<td>-0.052</td>
<td>P</td>
<td>0.705</td>
<td>0.036</td>
<td>-0.064</td>
<td>0.560**</td>
</tr>
<tr>
<td>HOMA2%S</td>
<td>ρ</td>
<td>0.004</td>
<td>P</td>
<td>0.977</td>
<td>0.190</td>
<td>-0.073</td>
<td>-0.993**</td>
</tr>
<tr>
<td>HOMA2 IR</td>
<td>ρ</td>
<td>-0.004</td>
<td>P</td>
<td>0.977</td>
<td>0.190</td>
<td>0.579</td>
<td>0.993**</td>
</tr>
</tbody>
</table>

Where * is significance (p<0.05).

Based on HOMA, a good correlation was observed between b-cell function using hyperglycemic clamps and continuous glucose infusion\(^{50}\). IR individuals usually suffer from many abnormalities, including glucose intolerance and increased concentrations of inflammatory markers in addition to increased risk for cardiovascular diseases and cancer. Therefore, Diabetic patients with IR are at a higher risk for these complications.

**Conclusion**

There is a stimulation of the immune system and increased IR and modulation of IR by increased cytokine levels in MDD. Homeostatic model assessment beta-cell function (HOMA2%B) and (HOMA2%S) is strongly correlated with insulin resistance level (HOMA IR) in MDD patients.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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Clients’ Satisfaction with Breast Cancer Early Detection Clinics in Iraq

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ABSTRACT

Client satisfaction is vital in health services evaluation; given the absence of screening program, it’s important to deliver breast cancer early-detection services that appeals for women to use and ensure appropriate follow-up and care.

A cross-sectional study conducted in two breast early-detection clinics on 500 attendants. Satisfaction questions included 38 items covering eight domains (access, building readiness, cost, time, organization, education and general satisfaction). Data were analyzed by one-way ANOVA, t-test and post hoc Tukey’s test.

Mean score of satisfaction was 22.39 ± 6.1. The result showed a low satisfaction level, yet lowest in time and education domains. Type of clinic, age, education, employment, socioeconomic status, residency, waiting and counseling time showed significant differences.

Regular monitoring of clients’ satisfaction is necessary to improve and increase service uptake. Care should be directed to clients’ feedbacks together with awareness campaigns that market the availability of clinics and motivate its use.

**Keywords:** Clients’ satisfaction; early detection clinic; breast cancer; satisfaction

Introduction

Cancer is a public health problem. Following cerebrovascular diseases; it is the second cause of death in Iraq with breast cancer as the leading cancer among women (4720 new cases) [¹]. Early detection of breast cancer can improve survival and reduces cost of care, [²] for these benefits to be obtained, a high-quality service is crucial. Client satisfaction is vital in health services evaluation; it was identified as a quality outcome indicator to measure success of breast cancer services delivery system [³]. So unless the service is satisfactory from the standpoint of the clients, it’s unlikely that early-detection program will achieve its functional development results, which after all, depend on clients’ involvement and use of the service [⁴,⁵]. Thus, feedback from client satisfaction surveys is a recognized benchmark for healthcare quality improvement plans.

Clients’ satisfaction plays an increasingly significant role in quality of care reforms and healthcare delivery [⁶,⁷]. Despite the fact that breast cancer is one of the most-studied areas, yet measurement of clients’ satisfaction and the quality of breast cancer services are in its infancy.

The late diagnosis among Arab and Iraqi women had been related to low participation rates in breast early-detection activities [⁷]. Aiming to provide a high quality care, the current study would help practitioners focus their efforts when planning initiatives targeting client experience and enhancing quality.

Materials and Method

This cross sectional study was conducted from Sept.2018-end of Dec.2018. Sample size was calculated using the following equation [⁸]: \[n = \left(\frac{z^2 \cdot p \cdot (1-p)}{E^2}\right)\] where
Z equals 1.96, E equals 5%, P considered 0.50. The sample size; after adding 20% for unresponsiveness and sampling bias, reached 500. Multistage sampling was adopted starting from the two health districts of Baghdad city, from each district one hospital was chosen randomly after excluding hospitals with damaged or unavailable mammography unit. Lastly 250 women were selected from each clinic using systematic random sampling by choosing every fifth client according to their exit order.

**Tool of the study:** A questionnaire contained two sections: **Demography and socioeconomic status (SES)** [9] and **satisfaction:** the questions were developed through extensive literature review [5,6,10], revised by a committee of experts in community and family medicine and was piloted on 50 clients; changes were made accordingly to ensure relevance of items as well as clarity in language. Reliability coefficient Cronbach’s Alpha was 0.863. It included 38 items covering eight domains. The items were assembled in two-point likert scale. Each question received a score of “1” for ‘satisfied/Yes’ and “0” for ‘dissatisfied/No’. Scores were summed so that higher scores reflect higher satisfaction.

**Statistical analysis:** Data presented in mean, standard deviation. Mean percentages were calculated for each domain via dividing mean satisfaction score of the domain by its highest score. Data analyzed by one-Way ANOVA, t-test and post hoc Tukey’s test, P ≤0.05 considered significant.

**Results**

The response rate was 97.8%, the mean age of the sample was 42.4 ± 12.3 years ranging from (14-74) years. Clients were asked about their experience and satisfaction. The average time required to reach breast clinics was 1.14 ± 0.6 hours. The average waiting time was 57.7 ± 51.3 minutes while mean counseling time was 5.72 ± 3.5 minutes. Less than half (45.8%) didn’t receive axillary examination and higher percent were not asked or examined for nipple discharges. Majority of providers didn’t explain their examination findings nor answered questions.

Those who were dissatisfied about the constellation of service (214; 42.8%) were asked to provide a suggestion for service provision. Increasing the number of ultrasound-specialists was the main suggestion (112; 52.3%), sixty-four (29.9%) conveyed the need for better ticket management and registration while 17.8% requested that all units of service placed in one vicinity and asked for elevators. Regarding education, 239(47.8%) knew about BSE, of them 22 (9.2%) described regular BSE monthly during the past year, while 213(89.1%) reported practicing BSE but not regularly and four (1.7%) did not practice although knowing the procedure. Majority of women would recommend the breast clinic to their relatives and friends, yet 219 (43.8%) were dissatisfied about the overall service. Figure (1) demonstrates reasons for dissatisfaction with service. The average satisfaction score was 22.39 ± 6.19 ranged from (6-38) scores. Table (1) displays satisfaction score for each domain. The result showed a low satisfaction level, yet lowest regarding time and education.

![Image](image-url)
Table 1: The mean, standard deviation and mean percentage for satisfaction domains

<table>
<thead>
<tr>
<th>Domains</th>
<th>Highest score</th>
<th>Mean(SD)</th>
<th>Mean% of satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Access</td>
<td>2</td>
<td>1.50(0.67)</td>
<td>75%</td>
</tr>
<tr>
<td>2. Facility Readiness</td>
<td>5</td>
<td>3.44(1.21)</td>
<td>68.8%</td>
</tr>
<tr>
<td>3. Cost</td>
<td>1</td>
<td>0.73(0.44)</td>
<td>73%</td>
</tr>
<tr>
<td>4. Time</td>
<td>5</td>
<td>1.71(1.14)</td>
<td>34.2%</td>
</tr>
<tr>
<td>5. Client-provider relationship</td>
<td>18</td>
<td>11.15(3.69)</td>
<td>61.9%</td>
</tr>
<tr>
<td>6. Organization</td>
<td>2</td>
<td>1.02(0.88)</td>
<td>51%</td>
</tr>
<tr>
<td>7. Education</td>
<td>2</td>
<td>0.71(0.75)</td>
<td>35.5%</td>
</tr>
<tr>
<td>8. General satisfaction &amp; loyalty</td>
<td>3</td>
<td>2.12(1.03)</td>
<td>70.6%</td>
</tr>
<tr>
<td>Total satisfaction</td>
<td>38</td>
<td>22.39(6.19)</td>
<td>58.9%</td>
</tr>
</tbody>
</table>

Results show satisfaction was higher among clients of Al-Yarmook clinic (p = 0.000), older (p = 0.003), illiterate (p=0.002), housewives (p=0.009), from rural areas (p=0.045) of higher SES (p=0.001), who waited ≤15 minutes for examination (p=0.000) and whom counseling duration lasted ≥10 minutes (p=0.000).

Discussion

To our knowledge this is the first study that tackled clients’ satisfaction with breast cancer early-detection services in Iraq. Given the absence of screening program [1,7] the main task is to provide an early-detection services that are appealing for women to use with proper follow-up care.

Satisfaction: Satisfaction in all probability depends on experiences that client faces before entering the health facility and goes to beyond counseling. In the current study, domains of satisfaction were analyzed to identify parts that can be targeted for provision.

Access, Facility readiness and Cost: Two thirds of women could reach the clinic easily and reported no access difficulty, majority of clients were satisfied about cost and to some extent about building readiness agreeing with previous literature [11-14].

Clients-Service providers’ relationship: Satisfaction is significantly altered by exchanges with healthcare providers [3]; the privacy, courtesy, explanations given before and after examination plus technical skills, all play in determining clients’ satisfaction. Previous studies described physicians’ gender as a barrier for seeking breast cancer early-detection services [15,16]; in this survey 28.4% reported dissatisfaction with service-provider’s gender. Though the results from client satisfaction surveys might be distressing for providers because it subjects them to criticism and comparison, yet it helps to provide a feedback for staff and health planners, repeated measurements serve to monitor change in clients’ satisfaction especially if coupled with service improvements [6].

Organization: Less than half were dissatisfied with service constellation, the main demands mostly poured in the frame of time management; i.e. providing human resources and organizing tickets and registration, both suggestions aim to decrease waiting time and stagnation of clients in clinics. Results of client surveys should be used to improve service. Satisfied clients are more likely to come back and deliver positive comments to others [3].

Time: The waiting time not only affects the pursuit of health services but also the judgement on health workers practice, even more than their information and technical abilities [17]. Waiting time was comparable to that reported in Vietnam (50.3 ± 55.1) but higher than results from India (12.16 ± 2.3) and China (18.00 ± 22.6) [17-19]. Introducing an invitation system maybe needed.

Education: Increasing awareness is the first step to fight breast cancer, BSE is recommended as a common method to increase breast awareness hence contribute to earlier identification and reporting. [15,20] nearly half of women knew BSE yet 9.2% described monthly practice, similar to Saudi Arabia where 7.8% practiced regularly [21]. Breast examination is a delicate subject, there is apprehension and fear from being diagnosed with breast diseases [16], thus education is mandatory to encourage commitment to early-detection services.

General Satisfaction: Majority of women reported that they would recommend the clinic to their friends.
and families which is consistent with literature. \cite{13,22} yet 43.8% gave a dissatisfied response regarding the overall service and half of them stated that care and attentiveness are much better in private clinics. Evidence shows that interaction with providers had the ability to amend client’s impression on facility and services it provides, thus improving client-providers’ relationship will eventually draw more women and increase loyalty to early-detection program \cite{3,22}.

Clients of Al-Yarmook clinic showed better satisfaction which maybe inherent to organizational and structural differences between clinics agreeing with results from Iran. \cite{23} Al-Yarmook clinic is installed in a general teaching hospital that clients could access all branches of medical specialties per their visit, while Al-Eliwiya hospital is specialized in women health: obstetrics and gynecology mainly.

Older clients had better satisfaction probably because older women have more free time and can tolerate clinic routine. Women with higher education expect more and demand more thus the inverse relationship between education and satisfaction which had been reported in literature. \cite{24} In the same context of meeting clients’ expectations, those who came from rural areas had better satisfaction, probably due to a previous experience with nearby health facilities of limited resources. Working ladies are less satisfied perhaps due to their tight schedules and dual responsibilities, this is supported by results from Basrah and Iran \cite{24}.

Being of higher socio-economic status showed better satisfaction in contrast to results from Iran \cite{23}, possibly because those of higher status constituted only 25% of the sample and the fact they are financially capable and probably have a conscious knowledge of how things work in public clinics, so most likely they have an assisting person whether it’s a relative working in the hospital or a paid staff that facilities their entry and registration without needing to wait. Longer waiting time may cause a disagreeable effect on patient’s experience. \cite{6,17,19} Similarly current results showed with longer waiting times and shorter counseling duration, satisfaction tends to worse.

**Conclusion**

The current study illustrated the less satisfactory parts of service with understanding of demographic variables that influence satisfaction. Regular monitoring of clients’ satisfactions is needed for provision and increase service uptake, with care directed to clients’ comments together with awareness campaigns that not only market the availability of breast early-detection clinics but also motivates women to use the service.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Self-funding

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The Prevalence of Polycystic Ovarian Syndrome and It’s Associated Symptoms in Selected Samples of Women in Al-Hilla City, Iraq

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College of Medicine, University of Babylon, Iraq

ABSTRACT

This study aims to investigate the prevalence of Polycystic Ovarian Syndrome (PCOS) and its associated symptoms in selected samples of women in Al-Hilla City, Iraq. The study was conducted from Sep 21, 2017 to Sep 21, 2018 at infertility and outpatient clinics in Babylon Teaching Hospital at Al-Hilla City. A total of 2152 women aged between 15-45 years old were evaluated through full history and examination including: age, parity, BMI, history of menstrual dysfunction (amenorrhea, oligomenorrhea, menorrhagia), history of acne, hirsutism, galactorrhea, history of primary or secondary infertility, any family history of PCOS, hormonal assay, and ultrasound for assessment of ovarian morphology. The Rotterdam 2003 criteria adopted by the European Society were used for the diagnosis of PCOS which is based on presence of 2 out of the 3 following criteria: 1. Oligo &/or anovulation 2. Hyperandrogenism whether clinical or biochemical 3. Polycystic ovarian morphology by ultrasound.

All groups were comparable in their demographic criteria. The prevalence of PCOS in the current study at Al-Hilla City was 28.9%. About 19.9% of them were adolescent while the majority of them were young age group (76.9%) with less prevalence over 40 years about 3.2%. Menstrual dysfunction present in (89.1%) of patients in form of oligomenorrhea 77.7% while menorrhagia & amenorrhea present in 13.7% & 8.6% respectively and only 10.9% had regular cycle. This study show that 45.2% had history of infertility in which about half of them is primary infertility. About 19.1% of patients were overweight while 21.5% were obese but the majority of them (53.7%) were of normal body weight. Also the majority of patients were nullipara 43.5% & 10.2% were unmarried.

About 11.9% had positive family history of PCOS while acne, hirsutism & galactorrhea present in 15.1%, 25%, 11.2% respectively. Women with PCOS at urban area form about 57.7% while about 42.3% were from rural area. The number of patients who show full-blown criteria of this syndrome i.e. all 3 clinical features present was about 19.4% while those with possible PCOS form about 80.9%.

PCOS is a common endocrine disorder that affects about one-third of women and need to pay attention and search for the causes to treat and prevent long-term sequels.

Keywords: prevalence, amenorrhea, oligomenorrhea, hirsutism, polycystic ovarian syndrome.

Introduction

One of the commonest heterogeneous endocrine disorders is polycystic ovarian syndrome which lead to several health problems such as menstrual dysfunction, hirsutism, acne, infertility, obesity and metabolic syndrome (1). Also it affects about 7% of reproductive age women (2).

PCOS seems to be associated with an increased hazard of metabolic aberration including hyperinsulinism, insulin resistance, type 2 DM, cardiovascular disease, dyslipidemia, and endometrial carcinoma (3). PCOS has a major public health attention in society, so therefore it’s necessary to identify the proportion of women affected (4).

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It is commonly present in young females with oligomenorrhea, anovulatory infertility, or hyperandrogenic manifestation such as hirsutism, acne & obesity however this syndrome is commonly seen in a woman of normal body weight (5). Pcos is a genetically complex disease of undetermined etiology (6). Many believed that Pcos seems to be familial with a several aspect differentially inherited from one generation to the next (7).

Evaluation of the prevalence of pcos depend on the community being assessed as there are ethnic variation in the biochemical and clinical characteristics of pcos (8). The stated prevalence of pcos varies between 2.2-26% (9).

The purpose of the current study is to provide a population-based estimates for the prevalence of pcos in al-hilla city depending on clinical records of pcos diagnosis and signs constant with pcos. This study is considered the first to be carried out in our city to evaluate the prevalence of pcos using ESHRE/ASRM Rotterdam consensus.

Many factors implicate in the development of pcos, possibly the disorder present as genetic predisposition in the individual & it’s symptoms may aggravated by life style & environmental factors (10).

Most women with pcos may show only one or two clinical manifestations & the commonest is menstrual dysfunction which is mostly begin from menarche or sooner after it & may present in form of amenorrhea, polymenorrhea or oligomenorrhea & even might being normal cycle (11,12). It appears that the prevalence of pcos is commoner among females younger than 35 years (13).

**Definitions**

**Overweight & Obesity:** According to WHO criteria, normal BMI (body mass index) is between 18.5-24.9kg/m2 while BMI between 25-29.9kg/m2 is overweight & >30 kg/m2 regarded obese one (14).

- oligomenorrhea means delay in menses of more than 35 days (15).
- Hyperandrogenism whether clinical diagnosed by depending modified Ferrman & Gallway scoring system for evaluating & quantify hirsutism using 9 body areas (16) or biochemical which is mean elevated level of androgen.
- Ultrasonography: pcos can diagnosed when more than 12 follicles of 2-9mm present in one or both ovaries & increase in ovarian volume of 10 ml in at least one ovary (17).

**Study Protocol:** A particularly designed data formula was applied for recording information including full history, history of menstrual irregularity, acne, hirsutism, medications & family history, physical examination, hormonal assay & ultrasound finding.

**Hormonal analysis** including FSH, LH serum prolactin, serum testosterone & midluteal serum progesterone. The normal cutoff of FSH&LH was taken as 1-10mlu/ml, prolactin level of <35ng/ml was regarded as normal & total testosterone of < 70 ng/dl was regarded as normal (18).

Confirmed pcos was established when the patient had full-blown criteria of all oligo &/or anovulation, clinical &/or biochemical hyperandrogenism & polycystic ovaries by ultrasound while possible pcos when the evaluation is incomplete or was unavailable but the clinical phenotype was otherwise suggestive of this disorder.

**Data Analysis:** Statistical study was carried out using SPSS version 20. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as (Means ± SD). Independent samples t-test was used to compare means between two groups. Paired t-test was used to compare means for paired readings. A p-value of ≤ 0.05 was considered as significant.
Results

Table 1: Distribution of patients according to history and types of infertility

<table>
<thead>
<tr>
<th>Study variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of infertility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>282</td>
<td>45.2%</td>
</tr>
<tr>
<td>Negative</td>
<td>342</td>
<td>54.8%</td>
</tr>
<tr>
<td>Total</td>
<td>624</td>
<td>100.0%</td>
</tr>
<tr>
<td>Types of infertility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>142</td>
<td>50.3%</td>
</tr>
<tr>
<td>Secondary</td>
<td>96</td>
<td>34.1%</td>
</tr>
<tr>
<td>Both</td>
<td>44</td>
<td>15.6%</td>
</tr>
<tr>
<td>Total</td>
<td>282</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 2: Distribution of patients with Full blown Criteria including (menstrual dysfunction+ hyperandrogism either clinical (acne and hirsutism) or biochemical (testosterone > 70 ng/dl) and PCOS finding by ultrasound)

<table>
<thead>
<tr>
<th>Full blown Criteria</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menstrual dysfunction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>556</td>
<td>89.1%</td>
</tr>
<tr>
<td>Absent</td>
<td>68</td>
<td>10.9%</td>
</tr>
<tr>
<td>Total</td>
<td>624</td>
<td>100.0%</td>
</tr>
<tr>
<td>Acne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>94</td>
<td>15.1%</td>
</tr>
<tr>
<td>Absent</td>
<td>530</td>
<td>84.9%</td>
</tr>
<tr>
<td>Total</td>
<td>624</td>
<td>100.0%</td>
</tr>
<tr>
<td>Hirsutism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>156</td>
<td>25.0%</td>
</tr>
<tr>
<td>Absent</td>
<td>468</td>
<td>75.0%</td>
</tr>
<tr>
<td>Total</td>
<td>624</td>
<td>100.0%</td>
</tr>
<tr>
<td>Testosterone level (ng/dl)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevated (&gt; 70 ng/dl)</td>
<td>186</td>
<td>29.8%</td>
</tr>
<tr>
<td>Normal (70 ng/dl or less)</td>
<td>438</td>
<td>70.2%</td>
</tr>
<tr>
<td>Total</td>
<td>624</td>
<td>100.0%</td>
</tr>
<tr>
<td>Ultrasound finding of PCOS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>618</td>
<td>99.0%</td>
</tr>
<tr>
<td>Negative</td>
<td>6</td>
<td>1.0%</td>
</tr>
<tr>
<td>Total</td>
<td>624</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The majority (77.7%) of patients presented with oligomenorrhea. (n = 556)

Full Blown Criteria present in only (19.4%) of study patients.

Discussion

In this study, the overall prevalence of pcos in alhilla city/middle of Iraq was 28.9% which is comparable to the prevalence of pcos in another clinical study done at Hawler city/north of Iraq which was 32% (19).

Another Iranian study show the prevalence of pcos was 19.5% based on Rotterdam criteria (20).

As there are national & racial variation in the manifestation of pcos ie: it varies either in its presentation or prevalence around the world or in different racial groups within a country (8).

In current study about 19.9% of those with pcos were in adolescent age group & this disagree with two Iranian studies carried at Hashemipour in Isfahan & Rahmanpour in Zanjan was 3% (21,22).

While about 76.9% of patients their age was between 20-39 years old & this results were consistent with Alnakash & Al-Taee study as they noticed that 87.8% of the women with pcos included in their study were less than 35 years of age (23).

About 19.1% of patient were overweight (BMI>25kg/m²) & 21.5% were obese (BMI >30kg/m²) which is opposite to that founded in 12 studies show that the prevalence of overweight & obesity was 21% & 19% respectively (20) while another study show that the
prevalence of overweight & obesity was 32% & 24% respectively & this might be suggest that obesity per se is not a universal criteria of this syndrome (9).

Also another study done on 400 patient show that 24% were overweight & 32% were obese (24).

About 11.9% of patient in this study had positive family history which disagreed with Kahrar et al study who found the ratio of pcos in mothers & sisters was 24% & 32% respectively (25).

In total of 5 Iranian studies, the incidance of infertility was natural as 8% while in current study, those with primary infertility was 50.3 % & secondary infertility was 34.1% respectively with total incidence of %45.2 (26) (Table 1).

The total number of patient that manifest the phenotype of pcos (full blown criteria of pcos was 19.4% & this agree with Azziz study & Dewielly which present in 18.2%. as shown in table 2 (26,27), but this disagree with another study which carried between July 1998-Oct1999 as it demonstrate that confirmed pcos was 6.6 (24).

The prevalence of menstrual dysfunction in this study was 89.1% which higher than the rate of 22.9% reported by Soloman GC in his study (28) (Table 2). As well as the most menstrual disorder was oligomenorrhea which present in about 77.7% as shown in figure 1.

About 10.9% of patients was eumenorrhic in current study & this is higher than 3.7% of eumenorrhic women in Molcolm study (29) as shown in table 2.

The prevalence of hirsutism in current study was 25% which higher than the rate of 2.4% of physician –diagnosed hirsutism stated by participating in the Nurses’ Health Study II (27) (Table 2).

The prevalence of acne in current study was 15.1% while the Iranian study show that acne present in 26% (20).

In 5 studies, ultrasound morphology of polycystic ovaries estimated to be 52% (20) while in our study about 99% had ultrasound show morphology of polycystic ovaries.

**Conclusion**

pcos is common endocrine disorder that affect about one-third of women & need to pay attention and search for the causes to treat and prevent long term sequels.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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Theory of Planned Behaviour for Cervical Cancer Prevention - View of Husband Support

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¹Faculty of Nursing, Universitas Airlangga, Surabaya, East Java Indonesia; ²Nursing Staff of Army Hospital Kediri, East Java Indonesia

ABSTRACT

The husband’s support is an important interpersonal factor in the prevention of cervical cancer performed by women but there are also women who have received support from their husbands who are still reluctant to make an effort related to the early detection of cervical cancer. This study aims to analyse the factors related to the husband’s support behaviour in cervical cancer prevention based on the Theory of Planned Behavior. This study used a cross-sectional design. The sample consisted of 102 husbands within childbearing couples taken using a cluster sampling technique. The variables of the research included the husband’s attitude, the subjective norm, perceived behavioural control, intention and support behaviour in relation to cervical cancer prevention. Data analysis was performed using Spearman Rho with α ≤0.05. The results showed there to be a significant relationship between attitude and intention (p=0.000; r=0.377), perceived behavioral control and intention (p=0.003; r=0.289) and the intention with the husband’s support behaviour in terms of cervical cancer prevention (p =0.000; r=0.431). The subjective norms within the intention indicate a significant relationship (p=0.059; r=0.188). To improve the prevention of cervical cancer, health care providers and health institutions should involve the husband to reduce female morbidity and mortality from cervical cancer.

Keywords: women, cancer, prevention, support, husband

Introduction

The early prevention of cervical cancer is possible to do since the beginning of cervical cancer caused by infection with the Human Papilloma Virus (HPV) which, if not dealt with, can be severe.¹ Cervical cancer prevention efforts are varied as improving public education activities on how to behave and how to live a healthy life, thus avoiding the risk factors for cervical cancer and offering early detection tests such as VIA and Pap tests, can reduce the incidence rate of cervical cancer.²

According to the WHO in 2012, new cases of cervical cancer total as many as 530,000 cases and deaths from cervical cancer reach as much as 270,000 cases, 90% of which occur in developing countries. Cervical cancer had the highest position in Indonesia in 2013, amounting to 0.8% and the estimated number of cervical cancer victims was 98,692 women. The East Java province ranks the third highest in Indonesia with the number of cervical cancer cases amounting to 21,313 inhabitants.³

In Indonesia, the government implements prevention efforts through early detection via pap smear tests. Health workers have made efforts to reach married woman by providing counseling about cervical cancer and facilitating the inspection of facilities for the early detection of cervical cancer. There are various factors that hinder the examination and early detection of cervical cancer in women such as shame and fear, the cost factor, especially in the economically weak, experience and motivation, as well as social support, especially from the husband as the decision makers in the family.⁴,⁵

Healthy behaviors arise when a woman gets support from the people nearby, one of which is the support from

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her husband. A supportive husband is decisive because it will reinforce the motivation for the prevention, including early detection, of cervical cancer. The researcher, J Community Health, found the husband’s support to be the dominant factor in the prevention of cervical cancer, but some of the mothers who had the support of a husband did not undertake these efforts. It showed no clear point of view on part of the husband and the factors that play a role in the business of the husband and wife when it came to supporting and strengthening their motivation to take steps to prevent cervical cancer.

Research was conducted by Madhivanan about the family support related to encouraging the participation of couples of reproductive age (EFA) in the prevention of cervical cancer. This included support measures from the viewpoint of the wife. Research on the behavior of the husband’s support in the prevention of cervical cancer has not been done focused on male subjects. The factors related to the behavior of a man’s support is important to consider.

The Theory of Planned Behavior (TPB) explains that the behavior displayed by the individual arises because of the intention to behave. The emergence of an intention to behave deals with three factors: the attitude towards the behavioral, the subjective norms and perceived behavioral control. The aim of the study was to analyze factors related to husband’s support behavior in the prevention of cervical cancer based on the Theory of Planned Behavior.

**Method**

This study used a cross-sectional design. The population consisted of husbands who were of fertile age, as part of a couple in the Kauman sub-district, Nganjuk. The sample size in this study was 102 respondents. The technique of the sampling used was cluster sampling. The independent variables in this study consisted of attitude, subjective norms, perceived behavioral control and intention. The dependent variable was the behavior of the husband’s support for cervical cancer prevention. This study uses a demographic questionnaire. The instruments used to measure the TPB component variables including attitudes, subjective norms, behavioral control perceptions and the husband’s intention was in the form of a questionnaire developed based on each parameter. The instruments of the husband’s support in preventing cervical cancer were developed based on the emotional, instrumental, informational and reward support parameters. They used a positive and negative scale in the form of Likert statements. The data classification of all of the variables was done using T score referring to the data mean. The instrument carried out both validity and reliability tests.

**Data Analysis:** The descriptive statistics method was employed to analyze the data to generate the study results in forms of frequencies and percentages. This method allowed to summarize the characteristics of the study subjects based on the variables selected. Inferential analyzed using Spearman’s Rho test.

**Results**

The respondents were aged between 26-35 years by as many as 42 people (41.2%). The majority of the respondents had completed high school education by as many as 61 people (59.8%). The dominant job was self-employment by as many as 48 people (47.1%). The average income of the respondents was more than Nganjuk’s minimum wage, by as many as 48 people (47.1%).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-25 years</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>26-35 years</td>
<td>42</td>
<td>41.2</td>
</tr>
<tr>
<td>36-45 years</td>
<td>38</td>
<td>37.3</td>
</tr>
<tr>
<td>46-55 years</td>
<td>21</td>
<td>20.6</td>
</tr>
<tr>
<td>Education:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary school</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Junior high school</td>
<td>13</td>
<td>12.7</td>
</tr>
<tr>
<td>Senior high school</td>
<td>61</td>
<td>59.8</td>
</tr>
<tr>
<td>Colleges</td>
<td>25</td>
<td>24.5</td>
</tr>
<tr>
<td>Occupation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government official</td>
<td>17</td>
<td>16.7</td>
</tr>
<tr>
<td>Private</td>
<td>37</td>
<td>36.3</td>
</tr>
<tr>
<td>Self-employed</td>
<td>48</td>
<td>47.1</td>
</tr>
<tr>
<td>Revenue:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ district wage</td>
<td>54</td>
<td>52.9</td>
</tr>
<tr>
<td>&gt; district wage</td>
<td>48</td>
<td>47.1</td>
</tr>
</tbody>
</table>

The majority of the respondents had heard of cervical cancer. The experience that most of the respondents had
with cervical cancer was derived from a famous person and the authoritative resources that the husband had used to know about cervical cancer included the internet and TV.

Table 2: Information of the respondents (n = 102)

<table>
<thead>
<tr>
<th>Cancer Information</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of cervical cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know</td>
<td>36</td>
<td>35.3</td>
</tr>
<tr>
<td>Ever heard</td>
<td>60</td>
<td>58.8</td>
</tr>
<tr>
<td>Do not know</td>
<td>6</td>
<td>5.9</td>
</tr>
<tr>
<td>Cancer Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family suffered</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Neighbours suffered</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Friend suffered</td>
<td>8</td>
<td>7.8</td>
</tr>
<tr>
<td>Famous person</td>
<td>83</td>
<td>81.4</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>5.9</td>
</tr>
<tr>
<td>Media Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet/TV</td>
<td>80</td>
<td>78.4</td>
</tr>
<tr>
<td>Magazine/newspaper</td>
<td>10</td>
<td>9.8</td>
</tr>
<tr>
<td>Banner/Flyers</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Health education</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>5.9</td>
</tr>
</tbody>
</table>

There is a significant relationship between attitude \((r=0.377)\), perceived behavioural control \((r=0.289)\) and intention related to the behaviour of the husbands’ support in the prevention of cervical cancer. The more positive the attitude and the better the perception of control in the behaviour of the respondent, the higher the intention to support cancer prevention.

There is no significant relationship between subjective norms and intention in reference to the behaviour of the husbands’ support in the prevention of cervical cancer. The absence of a significant relationship arises when someone has a belief that is less due to people who are considered to be less important showing expectations that need to be met by such a person.

There is a significant relationship between the intention to conduct support from the husband in the prevention of cervical cancer. Spearman’s correlation value of 0.431 indicates that the intention to provide support has a strong enough relationship and that it is in line with the behaviour of the husbands’ support in the prevention of cervical cancer.

Table 3: Husband Support Based on the Theory of Planned Behaviour

<table>
<thead>
<tr>
<th>TPB Factor</th>
<th>Intention</th>
<th>Total</th>
<th>Spearman’s Rho Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>34</td>
<td>33.4</td>
<td>19</td>
</tr>
<tr>
<td>Positive</td>
<td>13</td>
<td>12.7</td>
<td>36</td>
</tr>
<tr>
<td>Normal subjective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>31</td>
<td>30.4</td>
<td>26</td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td>15.7</td>
<td>29</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>34</td>
<td>33.4</td>
<td>24</td>
</tr>
<tr>
<td>Good</td>
<td>13</td>
<td>12.7</td>
<td>31</td>
</tr>
<tr>
<td>Intention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>38</td>
<td>37.3</td>
<td>9</td>
</tr>
<tr>
<td>High</td>
<td>21</td>
<td>20.5</td>
<td>34</td>
</tr>
</tbody>
</table>

Discussion

The majority of the respondents have a positive attitude. The supportive attitude was found in relation to the prevention of cervical cancer. They consider that the attitude of support is essential to bringing up the intention to provide support for the prevention of cervical cancer. The attitude of a significant predictor of the intention of women in terms of screening for HPV is involved in the early detection of cervical cancer. Someone is going to have a positive attitude about the behaviour of the support in the prevention of cervical cancer because they have a feeling that is focused on siding with the statement that it is crucial to assist in the study. Belief is proportional to the right attitude towards vaccination. A positive attitude has a significant relationship with predicting the intentions of eating a healthy diet in pregnant women. The Theory of Planned Behaviour states that attitudes toward a particular
behaviour are a determining factor for the formation of an intention.12

A positive attitude tends to elicit high intention, but some of the respondents have a positive intention but they are lacking otherwise. There are also respondents who act negatively but who have good intentions. Based on the Theory of Planned Behavior, intention is not only influenced by attitude but also by subjective norms and perceived behavioural control. Each has their strengths regarding which factor affects the intentions of the individual, so there are always people who have a high intention and a positive attitude.13 The existence of other factors that affect the intention and attitude includes the demographic data such as age, education, occupation, income, knowledge, experience and media exposure as generated by the respondent.

Good subjective norms do not necessarily produce a high intention. The husband’s intention to provide support for the prevention of cervical cancer was influenced by the individual. According to the research, the global burden of women’s cancers is a grand challenge in global health. Some of the influential persons out of the respondents included parents, spouses, neighbours, friends and health workers. Generally, people tend to have confidence in the direction of other people. Someone special to us will significantly influence the formation of our beliefs.14

Most of the respondents have less subjective norms that showed that her husband was less influenced by those closest to them confidence. There were also respondents who had proper subjective norms and high intentions. The subjective norms and intentions were less steep, as well as the subjective norms and intentions being lesser as well.

The perception of the control behaviour of the husband in the prevention of cervical cancer is more directed at the husband and their confidence in the factors that influence the behaviour of their support and the votes that possessed the power of perception. The researchers categorised the viewpoint of behavioural control into two categories: the behavioural control perception of good and the perception of behavioural control being lacking. The control perception of good behaviour indicates that the husbands tend to be able to control their perceptions of the factors that influence the behaviour of the support in the prevention of cervical cancer.15 The husband’s perception can efficiently perform the reaction in favour of cervical cancer prevention. The perception of less behavioural control shows the tendency of the husband to be less able to control the perceptions of the factors that influence the behaviour of the support in the prevention of cervical cancer. The husbands perceived that it was difficult to support their wives in the prevention of cervical cancer.

The majority of respondents have the high intention of demonstrating a strong desire and urge in themselves to provide support in reference to the prevention of cervical cancer, even if the intention associated with the behaviour of the husbands’ aid in the prevention of cervical cancer mostly shows a low intention and where actions are lacking. The intensity is generally comparable with the behaviour performed but some of the respondents have high intentions but demonstrate less supportive behaviour in the husbands. This is similar to the respondents who had low intentions but good behaviour. Other factors influence attitude - behaviour, subjective norms, the perceptions of behaviour control and specific intentions.14 A lack of facilities and infrastructure owned by the husband can be a factor that also supports the implementation of a behaviour. Facilities and infrastructure can involve time, energy, materials and facilities. It could require the husband to be able to guarantee the facilities to support cervical cancer prevention behaviour with their wife.17,18

In addition to the above factors, the demographic data of the respondents can also affect the intention and practices of the support from the husband. The respondents who had heard of cervical cancer tended to have high intentions and good behaviour. As demonstrated by the high intentions, good behaviour refers to the respondents whose knowledge of cervical cancer is limited. The high intention of the prevention can arise when exposed to sufficient information and the experience gained by the respondents who most often obtained said information from their community leaders. The knowledge gained by the respondents was indirect. The respondents sought to understand the dangers of cervical cancer, and so their intention seems to be high.

**Conclusion**

A positive attitude about the prevention of cervical cancer means that the intention that appears in the husband will also be high. If the husband has the
perception of good behaviour related to the control of cervical cancer then this can increase the husband’s intention to support the prevention of cervical cancer. The husband’s subjective norm has no relationship with the husband’s desire to promote the prevention of cervical cancer, which is indicated by the presence of respondents who have less subjective norms obtained from community leaders. They can increase the intention of high respondents in support of cervical cancer prevention. High intention can encourage the creation of supportive behavior from the husbands in the prevention of cervical cancer.

The national program for the prevention and early detection of cervical cancer needs a policy involving the husbands. The recommendations for further research to increase the awareness of the husbands are directly involved in the efforts to prevent cervical cancer in their partners.

**Ethical Clearance:** Considering the data collection and ethical practices, the research passed the ethical review of the health research ethics committee of Faculty of Nursing, Airlangga University with certificate number 426-KEPK.

**Source of Funding:** This study and publication was self-funded by the authors.

**Conflict of Interest:** There is no potential conflict of interest concerning the publication of this article.

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Dysmenorrhea is one of the problems among female adolescents. The dysmenorrhea incident rate in East Java reached 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. The aim of this study was to explain the correlation between physical activity as how it related to primary dysmenorrhea in female adolescents. This study used a cross-sectional research approach. The study was conducted in a Senior High School in Rengel, Tuban. This study used the purposive sampling technique. A total of 77 respondents (mean age 16.4 years), who were involved in the study. The data collection used a Physical Activity Questionnaire for Adolescents (PAQ-A) to measure physical activity and the measurement within the pain scale questionnaire used the Numeric Rating Scale (NRS). The data was collected using the questionnaires and the results were analyzed using the Spearman rho test with a significance level $\alpha \leq 0.05$. The results of this study showed there to be a correlation between physical activity ($p = 0.033$) and dysmenorrhea in female adolescents. The present study therefore has indicated a correlation between physical activity and dysmenorrhea. Physical activity is beneficial in reducing primary dysmenorrhea. For future implementation, it is suggested to conduct an appropriate intervention such as physical activity and stress management in order to reduce emotional symptoms associated with primary dysmenorrhea.

**Keywords:** physical activity, dysmenorrhea, female adolescents

**Introduction**

Primary dysmenorrhea is one of the most common gynecological disorders in women characterized by pain cramps in the lower abdomen during menstruation without pelvic pathology. This case often occurs in the first and second years after the onset of menstruation during ovulation. The overall prevalence of primary dysmenorrhea is 60% to 90% in female adolescents with a decrease in age. The psychological factors could involve primary dysmenorrhea, and a rise in prostaglandin, vasopressin concentrations and leukotriene levels. Prostaglandin causes pain by increasing the uterine tone and contractions. Pelvic cramping pain that starts just before or during menstruation and that lasts 1-3 days is a sign of dysmenorrhea. $2-4$ days before menstruation begins, the prostaglandin concentration increases to the uterine muscle during menstruation and it regulates the contractions of the abdominal muscles to help expel endometrial expulsion.

The dysmenorrhea incident rate in East Java reached 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. In addition, dysmenorrhea is a common cause of absence. The previous study showed that primary dysmenorrhea occurs less in women who exercise than women who do not exercise. Treating dysmenorrhea using abdominal and pelvic stretching exercises can be very effective at reducing pain in primary dysmenorrhea. Some studies have researched factors such as aerobic exercise as an effective treatment of dysmenorrhea but one study found there to be no relationship between exercise and dysmenorrhea. The variance of the findings on this disorder has led to present study focused on physical activity and the correlation to primary dysmenorrhea in female adolescents. It is expected to increase the knowledge on female adolescents as related to primary dysmenorrhea and it will hopefully motivate them to do more activities.
Method

Study Design, Setting, and Sampling: This study used a descriptive analytic design with a cross-sectional research approach. The population was obtained from a total of 331 female students from a senior high school in Rengel, Tuban. The study was performed on a total of 77 female adolescents who agreed to participate. The instrument used was a modification of the Physical Activity Questionnaire for Adolescents (PAQ-A) by Kowalski that had been adapted. It consisted of 7 questions about the summary of a person’s physical activity. Each question item consisted of 5 answer choices that described the intensity of the physical activity carried out. The measurement of primary dysmenorrhea used a questionnaire with a pain scale measurement using the Numeric Rating Scale (NRS) method.

Study Variables: The independent variable of this study was the physical activity. The dependent variable was primary dysmenorrhea.

Data Analysis: The descriptive statistics method was employed to analyze the data in order to generate the study results in forms of frequencies, percentages, mean, range and standard deviation. The data obtained was analyzed using the Spearman rho statistical test with a significance level of $p \leq \alpha \leq 0.05$.

Results

The menstrual information, i.e. age of menarche, length of menstrual cycle and length of menstrual flow, was recorded and has been shown in Table 1.

Table 1: Demographic data

<table>
<thead>
<tr>
<th>Respondent characteristics</th>
<th>Freq</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 years old</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>15 years old</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>16 years old</td>
<td>43</td>
<td>55.8</td>
</tr>
<tr>
<td>17 years old</td>
<td>27</td>
<td>35.1</td>
</tr>
<tr>
<td>18 years old</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Menarche</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 years old</td>
<td>5</td>
<td>6.5</td>
</tr>
<tr>
<td>12 years old</td>
<td>24</td>
<td>31.2</td>
</tr>
<tr>
<td>13 years old</td>
<td>31</td>
<td>40.3</td>
</tr>
<tr>
<td>14 years old</td>
<td>14</td>
<td>18.2</td>
</tr>
<tr>
<td>15 years old</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Family history of Dysmenorrhea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>54</td>
<td>70.1</td>
</tr>
<tr>
<td>Mother</td>
<td>19</td>
<td>24.7</td>
</tr>
<tr>
<td>Siblings</td>
<td>4</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Besides, the statistical results reflect that the length of the menstrual cycle was from 7 to 80 days, where nearly 90% of them had their cycle within 25 to 35 days. For the length of menstrual flow, all of the respondents reported that their menstruation would finish within 3 to 7 days.

This research was conducted to find out the relationship between physical activity participation and the intensity of lower abdominal pain as shown in Tables 2 and 3. For physical activity participation, the researcher defined it using two levels: if they participated in the school sports team in primary or secondary school and an average of their physical activity participation for a number of hours per week over the past three months. When we considered the average sport’s participation in hours per week over the past three months, 50 of out of 77 respondents had participated in sports activities less than or equal to 2 hours per week and 27 out of 77 of them had participated in physical activities for more than 2 hours per week.

Table 2: Distribution of physical activities in the school

<table>
<thead>
<tr>
<th>Physical activities</th>
<th>Type of extracurricular activities</th>
<th>Freq</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy physical activity</td>
<td>Sport</td>
<td>8</td>
<td>16.6</td>
</tr>
<tr>
<td></td>
<td>Art</td>
<td>14</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>26</td>
<td>54.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
<td>100</td>
</tr>
<tr>
<td>Mild physical activity</td>
<td>Sport</td>
<td>2</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>Art</td>
<td>15</td>
<td>51.7</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>12</td>
<td>41.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>29</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Distribution of physical activities and dysmenorrhea

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Freq</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity</td>
<td>Mild</td>
<td>29</td>
<td>37.7</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>48</td>
<td>62.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>77</td>
<td>100</td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>No dysmenorrhea</td>
<td>13</td>
<td>16.9</td>
</tr>
<tr>
<td></td>
<td>Mild dysmenorrhea</td>
<td>22</td>
<td>28.6</td>
</tr>
<tr>
<td></td>
<td>Moderate dysmenorrhea</td>
<td>35</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>Severe dysmenorrhea</td>
<td>7</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>77</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 4: The correlation between physical activity and primary dysmenorrhea

<table>
<thead>
<tr>
<th>Primary dysmenorrhea</th>
<th>No dysmenorrhea</th>
<th>Mild dysmenorrhea</th>
<th>Moderate Dysmenorrhea</th>
<th>Severe Dysmenorrhea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>∑</td>
</tr>
<tr>
<td>Mild</td>
<td>3</td>
<td>3.9</td>
<td>5</td>
<td>6.5</td>
<td>8</td>
</tr>
<tr>
<td>Heavy</td>
<td>10</td>
<td>13.0</td>
<td>17</td>
<td>22.1</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>16.9</td>
<td>22</td>
<td>28.6</td>
<td>35</td>
</tr>
</tbody>
</table>

$p = 0.033, r = 0.243$

Based on Table 4, it was found that most teenage girls who had heavy physical activity had mild dysmenorrhea (22.1%), totaling 17 respondents. However, the teenage girls with mild physical activity mostly experienced moderate dysmenorrhea (23.4%), totaling 18 respondents.

The results showed that the proportion coefficient (p) was 0.033. Therefore $p = 0.033$ was smaller than the level of $\alpha = 0.05$. This means that the hypothesis (H1) accepted that there was a relationship between physical activity and dysmenorrhea in female adolescents. The correlation coefficient (r) obtained the value $r = 0.243$. According to the table r-value, there was a correlation between physical activity with dysmenorrhea, although the correlation was weak or low.

Discussion

The result shows that there was a correlation between physical activity and the primary dysmenorrhea experienced by teenage girls. This is supported by the majority of respondents with a heavy physical activity pattern having experienced mild dysmenorrhea (17 respondents). However, the respondents who have a mild physical activity pattern mostly experienced moderate dysmenorrhea (18 respondents). The dysmenorrhea incident will increase the awareness rate of women who do less physical activity, thus when getting dysmenorrhea, the oxygen cannot be distributed into the blood vessels in the reproductive organs as effectively which leads to vasoconstriction. The menstrual pain may result from the increased contractions of the uterine muscle which is innervated by the sympathetic nervous system. Stress is supposed to increase the sympathetic activity which may lead to the increase in menstrual pain by enhancing the intensity of the uterine contractions. Due to the fact that exercise could reduce and moderate stress, the sympathetic activity may be decreased. Thereby, the intensity of the menstrual pain and other related symptoms may be reduced as well. Another possible dilemma in this respect is that since performing physical activity leads to the release of endorphins which are produced by the brain, the pain threshold can be enhanced.

Effective exercise seems to be perceived as superior and reliable among health institutions, doctors, and women; exercise is beneficial. However, a combination of organic, psychological, and sociocultural factors may also be responsible. A common problem in women of reproductive age, is a very serious problem that can often directly affect the quality of life and cause periodic college absenteeism. Exercise is commonly cited as a probable remedy for menstrual symptoms with limited research available. The purpose of this study was to observe the effect of aerobic exercises on Primary dysmenorrhea.

Methods: Study was a randomized clinical trial. Participants were 100 female college students who were divided in “exercise“ and “control“ groups. The “exercise group“ was given Aerobic exercises and results of three cycles were registered. Outcome measures were VAS for Pain and SF36 for Quality of life. Data was analyzed using paired t test, chi square test and z test for statistical significance. Results: The results showed that pain (VAS scores It refers to regularly participating in any kinds of sport’s team during primary and/or secondary school. This involves actively participating in physical activities. For substantial health benefits, adults need to do at least 150 moderate – intense activities per week. Therefore in this study, the researcher uses actively
participating in physical activities to refer to the females who participated in physical activities for more than 2 hours per week. Inactive or no participation in physical activities refers to females who participated in physical activities for less than or equals to 2 hours per week.

The data showed that the majority of respondents who did not experience primary dysmenorrhea did intense physical activity and only a small proportion of respondents did mild physical activity. The respondents who did mild physical activity mostly experienced moderate dysmenorrhea and some of the respondents did not get dysmenorrhea at all. From this data, the physical activity of the respondents can be related to the primary dysmenorrhea. Exercise improves cardiovascular status, increases bone mineral content and reduces dysmenorrhea and the symptoms of premenstrual syndrome.\textsuperscript{11,12} It also helps to reduce pain, relieve stress and improve mood and health. Women who exercise have less severe dysmenorrhea and greater positive effects than women who do not exercise.

Physical activity can increase the release of several neurotransmitters including natural endorphins (brain natural painkillers), estrogen, dopamine, endogenous opiate peptides and it can also change the reproduction of hormone secretion, suppress prostaglandin from being released and increase the ratio of estrone-estradiol. This works to reduce endometrial proliferation and injects blood flow away from the uterus.\textsuperscript{12,13} Exercise can increase concentration and improve mood and behavior. However, there were 3 respondents in this study who did mild physical activity but who did not experience primary dysmenorrhea. There were also 4 respondents who experienced severe primary dysmenorrhea despite doing heavy physical activity.

This could occur because each individual’s perception of pain is subjective, thus it results in a varied pain response. The pain felt by each individual is different because it is influenced by the factors that cause pain. A lot of respondents who experience primary dysmenorrhea found that it is also based on other influential factors such as adolescence, menarche age and family history.\textsuperscript{14} Menstrual pain often occurs in teenage girls because the reproductive organs are imperfect in terms of endometrium growth. They are psychologically unstable. The frequency of pain will decrease according to age. Another factor that can trigger dysmenorrhea is menarche. Menarche is occurring at an earlier age than normal, where the reproductive organs have not developed optimally and there is still a narrowing of the cervix. This results in pain when menstruating because the female reproductive organs are not functioning optimally. Family history factors also play a significant role in the occurrence of dysmenorrhea in adolescents.\textsuperscript{14}

The respondents who did mild physical activity were female students who took dance and other extracurricular activities. Many of the respondents who did heavy physical activity took on Red Cross duties as their extracurricular activities. Based on the results and the theory explained, the analysis showed that the teenage girls who did physical activity routinely stimulated the production of endorphine hormones. These hormones can control the blood vessels, returning them to normal and thus, the blood flow will go more smoothly and reduce the pain.

**Conclusion**

The results of this study confirmed that physical activity such as extracurricular programs in school may be the preferred intervention for dysmenorrhea. Physical activity can increase the release of several neurotransmitters which work to reduce endometrial proliferation and it can also inject blood flow away from the uterus. We concluded that physical activity has a positive correlation with primary dysmenorrhea, even though the statistic-based tests showed there to be a weak correlation. The findings of this study showed there are other factors that can affect primary dysmenorrhea, such as age, menarche age and family history. It is recommended to improve and develop any other aspects associated with dysmenorrhea because it seems to be a significant problem for female adolescents that can cause further damage.

**Ethical Clearance:** The ethical approval for this study was granted by the IRB committee of the Faculty of Nursing at Airlangga University in 2017.

**Source of Funding:** The funding of this study was independent by the authors.

**Conflict of Interest:** None

**REFERENCES**

‘It was Hard but it is Satisfying’: The Lived Experience of Older Adults Moving to a Residential Home (Griya Werdha) in Surabaya

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ABSTRACT

Relocation stress could occur in relocated older adults. The signs and symptoms often manifest as non-specific complaints. This study aimed to elicit the lived experience of relocated older adults in a residential home in Surabaya. Individual interviews were conducted following consent being given, in addition to MMSE, GDS and Family APGAR score tests. Seven residents aged between 60 to 80 years old voluntarily participated in this study. A phenomenological approach was used to develop the narrative findings following verbatim transcription and the work by Colaizzi (1976). Five themes emerged from the study: moving was a hard decision, feeling lonely in the first months, trying to accept changes and the feeling of being health-supported. These themes reflected that moving to a residential home was hard despite the voluntary decision. Eventually, they adapt by virtue of support from the other residents, their visiting families and the health staff. Their final stories reflected satisfaction focused on their well-maintained daily and health needs.

Keywords: Relocation stress, older adults, residential home, experience

Introduction

Older adults who decide to or who are forced to live in residential homes are prone to psychological symptoms, such as relocation stress syndrome. The North American Nursing Diagnosis Association identifies relocation stress syndrome as a condition in which a person suffers from physiological and psychological disorders as a result of relocation from their home to a foreign environment. This can lead to stresses either physically, psychologically or socially. Health-professional support is significant when it comes to assisting older adults who are moving to a new environment, such as to a residential home.

Statistically, it is estimated that around 11,914 older adults are residents in both public and private nursing homes spread across Indonesia. Our preliminary study conducted in October 2017 at Griya Werdha, a residential home in Surabaya, identified that 19% of the residents were moving in less than 4 months. Four of them suffered from moderate to severe depression. Presumably, this is due to the adjustment process and it is an indication of the relocation stress. Relocation-stressed adults could experience changes in their self-control, identity and self-esteem due to the new environment whereby they might lose some degree of privacy while trying to establish a new relationship with the other residents.

Psychological support is significant when it comes to assisting the residents to adapt to the new homely environment. Nonetheless, there is an area of silence in the literature to explain this assumption in the context of Indonesia. Thus, this study was designed to elicit the lived experiences of older adults as new residents in Griya Werdha. It is expected that the results would illuminate the expectations toward a better service in residential homes. We used the theory of life crises and transitions by Moos & Schaefer as the lens in terms of gaining an understanding of the studied phenomenon.
Method

Study Design, Setting, and Sampling: This study used a phenomenological approach to understand the lived experiences of older adults who were recently moving from their home to a residential home in Surabaya. The setting was purposively selected as it represented the most accessible facility for most older adults living in Surabaya and the cities nearby. The informants were recruited purposively through the snowballing technique. The criteria determined in this study was to include only residents aged 60 - 80 years old, moving in to the Griya Werdha in four months or less at the time of data collection, with a good cognitive status and who were able to communicate well.

Data Collection: All potential informants were first screened for cognitive function using Mini Mental State Examination (MMSE). Their level of stress was measured using the Geriatric Depression Scale (GDS-SF) short form and APGAR (adaptability, partnership, growth, affection, resolve) following individual consent being given. The informants who met the inclusion criteria were then invited to an individual guided-interview using a list of open-ended questions. A hermeneutical process and probing questions were employed to engage with the informants’ worldview. Each interview was audio recorded and transcribed verbatim.

Data Analysis: The collected data was then analyzed following the seven steps provided by Colaizzi (1976). These steps were as follows:

- **Step 1, active reading:** The authors actively read the entire transcript, which involved repeated readings with the aim of understanding the general picture of the informant’s perspective on the experienced phenomenon.

- **Step 2, color coding:** This step was conducted to identify the color-coding significant statements. The color-coded statements were then copied for the next step.

- **Step 3, giving meanings:** This process inquired the authors to carry out an internal process to interpret the meaning of each statement using the participant’s point of view. This process involved back and forth discussions between all authors to formulate the meanings that emerged from each informant.

- **Step 4, developing themes:** This step included categorizing each unit of meaning into potential themes by collecting the coded statements that shared similar information into sub-themes or themes.

- **Step 5, integrating themes into a complete description:** This step was carried out through a deeper discussion in order to obtain a clear and justified description on the generated themes and sub-themes.

- **Step 6, validation to informants:** The generated description was then given to the informants for a final reading and compliance check. This step was significant to ensure that the stories developed through the different informants reflected their personal experience in the past. For the informants who were unable to read, the chief investigator of this study read the results on behalf of the informant.

- **Step 7, refining results:** The results were refined if there any complain occurred during the validation process.

Results

Three female and 4 male older adults as new residents voluntarily shared their lived experience when they decided to move in to the Griya Werdha. Their ages ranged from 61 years to 78 years. Their last education obtained was as follows 1 person never went to school, another person did not finish primary school, 1 person graduated from elementary school, one person graduated from junior high school, two graduated from high school or the equivalent and one person graduated from college. They were mostly Javanese; 4 of them were Moslems and the others were Christian by religion (see Table 1).

Table 1: The demographic characteristics of the new residents who were participating in the study (n = 7)
Four themes emerged in this study and these can be understood as structures that shape their experience. They were: moving was a hard decision, feeling lonely in the first few months, accepting changes and the feeling of being health supported.

**Moving was a hard decision:** Making the firm step to live at Griya Werdha was difficult, even though it was their decision. The informants recalled that they never had an idea of what it would be like to live in a nursing home, as informant 1 recalled:

> “I was shocked because I felt alienated. Previously, I would never know, oh...here we are now, oh now we have rules. So, we were shocked and we can’t get out. I used to be free to go anywhere and I can’t do it anymore” (Informant 1)

It was a mixed feeling when discussing about the residents’ life in the past. Many of them were reminded of the job that they used to work for a living and some of them were reminded of their families at times, as Informants 3 and 7 stated:

> “…I kept thinking about my old job... I didn’t feel comfy to have left it that way...” (Informant 3)

> “Sometimes I feel fine and happy but I always remember my family...” (Informant 7)

**Feeling lonely in the first months:** The changes felt by the informants when starting to live in the residential home were expressed as them feeling lonely. They recalled that they used to have many types of old friends. They compared that they were now in an uneasy situation to make new friends, as Informant 1 replied:

> “…I felt lonely, yeah, lonely. I have many friends out there, many kinds of them and free. I had to make friends with those who stayed in this... around here” (Informant 1)

On the other hand, they also highlighted that they, many times, missed their family, as stated by Informants 5 and 6:

> “…yeah, that feeling keeps distracting me... I miss my family...” (Informant 5)

> “…But, to be honest, I miss my little grandson.” (Informant 6)

**Accepting changes:** Eventually, all residents have to accept change to adapt to the new environment provided in the residential home. They started to seek distractions through various activities, including watching TV and regularly exercising. For instance, Informant 1 and 4 replied:

> “…we watch TV and karaoke, for entertainment. To get rid of the feeling of being lonely, we watch TV and do karaoke. It feels a little better” (Informant 1)

> “We do sports and aerobics, every day. There are also dancing competitions sometimes” (Informant 4)

Slowly but surely, the new residents started to accept their new life. They distracted their thoughts and avoided negativity, such as recalled by Informants 5 and 7:

> “…I convinced myself that I had lost my life out there. I was starting a new life here” (Informant 5)

> “To overcome this problem, I try to be happy, think positively and what can I do? I must accept my fate as it is” (Informant 7).

The process of accepting changes in their life was also facilitated by their family and relatives who were regularly coming to see the informants to ensure that they were not alone. Informant 3 and 7 recalled:

> “I still have a nephew. They also often come here to see me” (Informant 3)

> “I have nephews and grandchildren, twice already, they have visited me twice” (Informant 7)

**Feeling of being health-supported:** Currently, the residents evaluated that living in the residential house was fully supported despite the restrictions put in place by the rules and regulations. The informants expressed their satisfaction of the support given by the nurses and social workers who worked in Griya Werdha, their residential home.
“Good, everything is fulfilled. For example, eating… all of my health needs are fulfilled” (Informant 3)

“All I know is that I am happy. I like it. First when I came here, I was sick. After I was cured, then they told me to stay. I don’t have to worry about eating and sleeping. They give me enough heat and sleep. And that’s true” (Informant 7)

Discussion

The study findings elicited the older adults when they decided to move into a residential home in Surabaya. They were unaware about living-in as new residents due to a lack of information regarding their life-changing decision. They expressed that it was not as expected and that there was a sense of regret during the first four months as new residents. In most cases, the informants were moving into residential homes due to loneliness, a decreased health condition and limited health support at home.\footnote{Hesitation, feeling shocked, rejection, or mixed feelings were apparent as they verbally expressed their experiences when moving to Griya Werdha.}

Feeling lonely was expressed when the informants were asked about their experience of living-in in the first months. They lacked information on what it was like to stay under unheard rules and regulations, which restricted them from going out of the facility even for a short amount of time. This situation could be a contributor to the drastic changes for the new residents and this explains their unheard expressions due to the transition.\footnote{However, this was not explored further in the current study. The change of feeling could also an effect from the meaningful difference between the person’s past life-experience and their current situation. Thus, relocation has an impact on psychological well-being.\footnote{We assume that restricted mobility and unfamiliar rules and regulations were responsible for the residents’ psychological well-being. This finding recommends that older adults should be well prepared before making the decision to live in a residential home and the health personnel thus need to support them during the transition period.}}

Light exercise, watching TV and aerobics were selected as how the new residents tried to overcome their blue feelings. They were distracted by different activities and pleasant thoughts as a means of transferring the feeling of loneliness. The theory of crisis and life transition simply defines this as a resolution phase, where a person consciously selects coping skills to resolve any problems and changes.\footnote{This study found that the coping mechanism of the new residents was adaptive and self-reliant despite their various levels of education background. This finding calls for a further study to investigate on how education can impact on older adults when selecting a coping mechanism.}

The new residents were supported through the provision of scheduled activities, including religious activities, physical exercise and periodic health checks, as well as supportive facilities such as an outdoor gazebo, playing cards, musical instruments and a Karaoke set. All of these have the aim of letting them make themselves feel at home. Koppitz et al\footnote{identified four phases of adaptation in relocated adults: being cut-off, being restricted, being cared for and moving on. The residents who were participating in this study were mostly in the phase of moving on, whereby they had adapted to the new homely setting and had accepted the scheduled activities. This phase was achieved as all of the informants had stayed in the residential home for more than 4 months by the time that the data was collected. However, this study was not designed to explore the length of their stay and the correlation with relocation stress.} -identified the need for well-maintained communication between the residents and their families.

Family support became an important element for a successful transition. Frequent visits were highlighted as an indication of the meaningful attention perceived by older adults who were moving to Griya Werdha. This suggests that family visits could help the new residents to cope with their loneliness and it could also maintain their psychological well-being.\footnote{Family support became an important element for a successful transition. Frequent visits were highlighted as an indication of the meaningful attention perceived by older adults who were moving to Griya Werdha. This suggests that family visits could help the new residents to cope with their loneliness and it could also maintain their psychological well-being. These findings highlight the need for well-maintained communication between the residents and their families.}

The informants in this study expressed meaningful feelings when asked about their recent experience of living in the Griya Werdha. They expressed happy feelings, which was in contrast with the first few months of moving-in. Moving in to Griya Werdha was an unpleasant experience. Nonetheless, their acceptance of the change eventually made them satisfied concerning living in the residential home. This finding is shared with an earlier research study by Chang et al\footnote{despite the feeling of being isolated remaining. The residents also expressed their gratitude for having a place to continue their life without worrying about needing support for their daily needs.} despite the feeling of being isolated remaining. The residents also expressed their gratitude for having a place to continue their life without worrying about needing support for their daily needs.
Conclusion

Hesitation, feeling shocked, rejection and mixed feelings were verbally expressed by the residents in this study when discussing their experience of first moving to Griya Werdha. The lack of information on what it was like to stay under unheard rules and regulations were reasons behind these psychological expressions. Thus, this highlights an urgency; older adults should be well prepared before making the decision to live in a residential home. This study found that the coping mechanism of the new residents was being adaptive and self-reliant despite their different education backgrounds. Family support emerged as an important element for a successful transition. The residential home thus needs to facilitate a well-maintained communication between the residents and their families.

Ethical Clearance: The ethical review of this study was granted by the Health Research Ethics Commission (KEPK) of Universitas Airlangga, certificate number 592-KEPK.

Source of Funding: This study was financially supported by the Institute for Human Resources Development and the Ministry of Health of the Republic of Indonesia. The Institute was not involved in the development of the study, in the report writing or in the decision to submit the article for publication.

Conflict of Interest: None

REFERENCES


Pre-Schoolers’ Eating Behavior in Urban Communities: An Overview

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ABSTRACT

Introduction: Adequate nutrition is needed by preschool-aged children to allow for growth and development optimally. Eating behavior during the preschool years also shapes lifelong dietary preferences. This study aimed to describe the pre-schooler eating behavior in urban communities.

Method: The design used was descriptive with a cross-sectional approach. The population consisted of mothers and preschool-aged children (aged 3-5 years) in Gresik Regency (an urban area in East Java). The sample size was 90 respondents, taken using a simple random sampling technique. Preschool eating behavior is defined by energy adequacy level and dietary diversity. The data was collected using food recall over 24 hours and this was described using frequency and percentage distribution.

Results and Analysis: The results showed that most pre-schoolers had a good energy adequacy level (64.4%). The most significant contributors to energy were carbohydrates, protein and fat. Most pre-schoolers have good dietary diversity (75.6%). Most of their food composition consisted of rice, animal and plant protein and milk. Vegetables and fruits were rarely consumed.

Discussion: It can thus be concluded that the pre-schooler’s eating behavior in urban communities was good. Further research can use these findings to develop an intervention to enhance the healthy eating behavior of pre-school children in urban communities.

Keywords: eating behavior, preschool aged-children, urban communities

Introduction

The growth spurt and rapid development occurred at <5 years of age.¹ This represents a time of significant cognitive and behavioral growth, dominated by the dynamic and robust progressive process of brain development that will later be continued with maturation and experience.² with the initial expression of many psychological abilities that will continue to be refined into young adulthood. Likewise, brain development during this age is characterized by its “blossoming” nature, showing some of its most dynamic and elaborative anatomical and physiological changes. In this article, we review human brain development during the preschool years, sampling scientific evidence from a variety of sources. First, we cover neurobiological foundations of early postnatal development, explaining some of the primary mechanisms seen at a larger scale within neuroimaging studies. Next, we review evidence from both structural and functional imaging studies, which now accounts for a large portion of our current understanding of typical brain development. Within anatomical imaging, we focus on studies of developing brain morphology and tissue properties, including diffusivity of white matter fiber tracts. We also present new data on changes during the preschool years in cortical area, thickness, and volume. Physiological brain development is then reviewed, touching on influential

Adequate nutrition can be obtained through a variety of diets in recommended amounts, based on the body’s dietary needs. This refers to frequent eating, where preschoolers should eat every 3-4 hours or about 4-6 meals every day. In portions, their plates should consist of half vegetables and fruits, a quarter for healthy carbohydrates, and the rest being healthy proteins, including oils, milk and water. When it comes to choosing a diet, preschoolers still depend on their mother. On the other hand, as their sense of taste develops, preschool-aged children have their own food preferences and they become more selective in their choice of food. They also are easily attracted by unhealthy snacks in their environment. Once they have established unhealthy eating behaviors, it is hard to correct in later life. Poor eating behavior in children is a public health issue. Little is known about the preschoolers’ eating behavior in urban communities.

Unhealthy eating behavior in preschool children can lead to malnutrition. Longitudinal research using Indonesia Family Life Survey’s data found that the prevalence of stunting and underweight preschoolers decreased significantly in waves 1 to 4 (stunting from 50.8% to 36.7%; underweight: from 34.5% to 21.4%). The prevalence of ‘at-risk’, being overweight or being obese increased significantly from 10.3% to 16.5%. Stunting, and at risk of overweight/obesity or obesity in Indonesian children aged 2.0-4.9 years; and the National Health Survey (RISKESDAS) in 2013 noted that 37% of children aged under 5 years old were affected by moderate and severe stunting, 12% of children aged under 5 were affected by wasting (low weight-for-height) and 12% of children were overweight. The prevalence of malnutrition is decreasing compared with 2010, but it still cannot achieve the WHO target on Sustainable Development Goals (SDGs).

A child deprived of adequate nutrition may never reach his full physical or cognitive potential, which can limit his ability to learn and earn. They also have an increased risk of falling sick and experiencing a greater severity of disease.

In developing countries such as Indonesia, the double burden of malnutrition is more prevalent in urban areas. Urban malnutrition is caused by unhealthy eating behavior. Urban populations tend to consume more calories and more highly processed foods. They frequently rely on cheap and convenient street foods. However, they also have good access when it comes to accessing a greater diversity of fresh foods such as animal-sourced foods, legumes, vegetables and fruits.

Gresik Regency is categorized as an urban area that is in the northwest of East Java Province, along the coastline. By 2017, from the 84,696 under five year old children who came to Posyandu Balita (integrated health care center for under five-year-old children) in Gresik Regency, 0.6% were found to be underweight. The previous research found that most of the mothers in the area preferred to buy food from food stalls instead of cooking themselves. The composition of the food consumed was often a rice and protein made both from either animals or plants. This study aimed to describe the preschooler eating behavior in urban communities.

Method

Study design, setting, and sampling: This was descriptive research with a cross-sectional approach. The population consisted of mothers and preschool-aged children (aged 3-5 years) in Gresik Regency registered as members of a Posyandu Balita. The sample size was made up of 90 mothers and pre-schoolers in pairs, who became involved using a simple random sampling technique. Randomization was conducted by entering all pre-schooler names into a fishbowl, prior to their selection. In the case of non-consent, we re-did the selection process to achieve 90 respondents.

Study variables and data collection: The general demographic data that was collected included the mother’s age, the children’s age and the familial monthly income via a questionnaire completed by the mothers at the time of recruitment. It is important to describe the characteristics of a population. A 24-hour dietary recall (24HR) was used to evaluate the child’s eating behavior. The 24HR is a structured interview designed to capture detailed information about all foods and beverages taken in the past 24 hours. The mother was asked to report and complete the form on behalf of the children. In order to make it easier for the mother easier when reporting their pre-schoolers’ meals, a food model was provided during the interview. The energy adequacy level was evaluated by comparing the results of the 24HR with

results from several different functional imaging and recording modalities in the preschool and early school-age years, including positron emission tomography (PET). Thus, there is a need for adequate nutrition to achieve optimal growth and development.
the Recommended Dietary Allowance (RDA) for preschool-aged children in Indonesia, according to Widyakarya Nasional Pangan dan Gizi. The data was then categorized as 1) Good ≥100% RDA, 2) Fair >80-99% RDA, 3) Less 70-80% RDA and 4) Deficit <70% RDA. Dietary diversity was evaluated by assessing the variety of food consumed by the pre-schoolers which should consist of healthy carbohydrates, animal or plant protein, vegetables, fruits, healthy oil, dairy and water. The data then categorized as 1) Good (all food components were fulfilled) or 2) Not good. All prospective respondents were given information about the study. Written informed consent was obtained from all participating mothers. The respondents completed the informed consent form while waiting for service at Posyandu Balita.

**Data Analysis:** Descriptive statistics were used for all of the data represented. The collected data was described using frequency and percentage distribution.

**Results**

Table 1 presents the characteristics of the respondents. It shows that most of the mothers were classified as young adults (21-40 years old), by as many as 95.6% mothers. More than half of the pre-schoolers were three years old, as many as 55.6%. Most of the respondents were living in a family with a monthly income that was less than the regional minimum wage (IDR 3.867.874), as many as 75.6%. Table 2 presents the frequency and percentage distribution of the respondents based on the variables. It shows that most pre-schoolers have a good energy adequacy level, as many as 58 respondents (64.4%). Most pre-schoolers have good dietary diversity (68; 75.6%). Most of the food composition consisted of rice, animal and plant protein and milk. Vegetables and fruits were rarely consumed.

**Table 1: Demographic characteristics of the mothers and pre-schoolers (n = 90)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
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</thead>
<tbody>
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</tr>
<tr>
<td></td>
<td>21-40 years old</td>
<td>86</td>
<td>95.6</td>
</tr>
<tr>
<td></td>
<td>≥41 years old</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td>Children’s age</td>
<td>3 years old</td>
<td>50</td>
<td>55.6</td>
</tr>
<tr>
<td></td>
<td>4 years old</td>
<td>23</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>5 years old</td>
<td>17</td>
<td>18.8</td>
</tr>
</tbody>
</table>

**Table 2: Frequency and percentage distribution of the respondents based on the variables (n = 90)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy adequacy level</td>
<td>Good</td>
<td>58</td>
<td>64.4</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>27</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Deficit</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dietary diversity</td>
<td>Good</td>
<td>68</td>
<td>75.6</td>
</tr>
<tr>
<td></td>
<td>Not good</td>
<td>22</td>
<td>24.4</td>
</tr>
</tbody>
</table>

**Discussion**

Most pre-schoolers had a good energy adequacy level. It means that most of them had an adequate intake for energy. The RDA for Indonesia stated that an adequate energy intake for a child 1-3 years old is 1,350 kilocalories per day while for a 4-6 year old it is 1,400 kilocalories per day. The adequate energy intake for the pre-schoolers was determined by considering a healthy child’s daily need for energy to support their growth. For ≥4 year old children, correction for physical activities was added.

The research results showed that all of the respondents with a less energy adequacy level were five years old. As they grow older, preschool-aged children develop their food preferences. Furthermore, most children began to attend school at five years old. Previous research found that almost 75% of 5-year-old children did not meet their estimated energy requirements. The school environment sometimes exposes preschoolers to unhealthy food choice or street foods.

The energy is required for maintenance, growth and repairs of the body. Carbohydrates, protein and lipids are major sources of energy. Similar to this statement, the research results found that the most significant contributors to energy were carbohydrates, protein and fat. The typical Indonesian diet is high in carbohydrates and starchy foods, with cereals being the primary source. Previous research also found that urban communities tend to consume more calories and more highly processed foods. They frequently eat convenience street foods, which are cheaper and simpler.
than cooking at home. Affordability is still a barrier for low and middle-income groups. In this research, many of the respondents with a family monthly income of less than the local minimum wage had an inadequate energy intake. On the contrary, there was one preschooler with a family monthly income that was more than the local minimum wage who had a less adequate energy level.

Based on the demographic data, the mother was ≤20 years old. Mothers of a younger age usually have a low level of nutritional knowledge and experience. Dietary diversity is a qualitative method used to measure food consumption that reflects the household’s access to a variety of foods and it can be a proxy for the nutrient adequacy of the diet of individuals. Most respondents had good dietary diversity. This means that the food consumed by the preschoolers consisted of carbohydrates, animal or plant protein, vegetables, fruits, healthy oil, dairy and water. A diverse diet is needed to ensure optimum growth in preschoolers. Urban communities have good access to a greater diversity of fresh foods such as animal-sourced foods, legumes, vegetables and fruits compared to rural communities. This supports the availability of diverse foods.

Based on a 24HR analysis, most of the food composition consisted of rice, animal and plant protein and milk. Vegetables and fruits were rarely consumed. Many of the respondents still perceive that the most important thing is the adequate intake of energy, although the diet itself was not varying in nutrients. Rice is a staple food of Indonesians that supplies around 70% of the total energy. Because of its location, near to the coastline, Gresik Regency is abundant in seafood-based protein. People living there mostly have a good protein intake. Previous research found that more than half of the children in Indonesia have dietary intakes that are less than the RDA for vitamins, which can be obtained by consuming vegetables and fruits. Another research study found although the nutritional value of preschoolers fulfilled their RDA, the nutrient compositions often did not meet the necessary standards. Mothers were seen as the key moderator influencing their dietary intake of vegetables, fruits, and other healthy foods. However, mothers face numerous challenges in feeding their pre-schoolers vegetables and fruits, such as the child’s aversion to vegetables (because of their unpalatable taste), the family environment and the short shelf life of fresh vegetables and fruits.

**Conclusion**

The pre-schoolers’ eating behavior in urban communities was good. The mothers should gain more knowledge about nutrition and food composition which fits with the needs of pre-schooler to allow them to grow optimally. The mother also should shape the good eating skills of their pre-schoolers. These findings can be used to develop an intervention in order to enhance healthy eating behavior in pre-schoolers in urban communities.

**Ethical Clearance:** This research has passed the ethical test conducted at the Ethics Committee of the Gresik Regency Health Office number 800/1553/437.52/2012.

**Source of Funding:** This study was a self-funded research project.

**Conflict of Interest:** We declare there to be no potential conflicts of interest with respect to the research and/or the publication of this article.

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Playing Cards Using the “Tepuk Nyamuk” Method Improves Cognitive Function and Social Interaction in the Elderly

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1Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Playing cards using the “tepuk nyamuk” system is a game using a standard 52-card deck to focus between the words spoken on the card that is to be issued while tapping the back of the hand between the players on the card. The study aimed to find out the effect of playing cards using the “tepuknyamuk” method on improving cognitive function and social interaction. This study was quasi-experimental with 30 respondents who were elderly individuals who experienced cognitive decline and social interactions. The independent variable was playing cards in the “tepuknyamuk” method and the dependent variables were cognitive function and social interaction. The results indicate that there was an influence from playing cards on cognitive improvement (p=0.000) and social interaction (p=0.000). Playing cards in the “tepuknyamuk” method has the positive effect of improving cognitive function and social interaction for older adults. Further studies are suggested to determine the effect playing cards on other cognitive components.

Keyword: playing cards in the “tepuknyamuk” method, cognitive, social interaction, elderly

Introduction

The elderly experience normal cognitive decline problems across all aspects including a decrease in memory, language, thoughts and considerations. In general, the prevalence of dementia and Alzheimer’s is 3-10% at 65 years of age and it ranges from 25-50% at the age of 85 years and above.

Based on a preliminary study, 40 out of 138 (28.29%) older adults experienced cognitive decline. The risk factors for decreased cognitive function include age, sex, education, area of residence, reduced physical and social activity and diseases such as those that are cardiovascular in nature, diabetes mellitus, hypertension and cerebrovascular issues. The decline in cognitive function needs to be overcome because it plays an important role in daily activities such as decision making, thinking and remembering things. The impact of cognitive decline is dementia and in the long term, this can cause Alzheimer’s disease.

The risk factors that affect the decline in social interactions include health, family problems and social support. The impact of a decrease in social interaction is cognitive impairment and this can also trigger social isolation. The research conducted by Zhu et al, found that recreational activities can improve cognitive function and social interaction because there are many activities such as walking, cycling, gymnastics and playing puzzles that facilitate cognitive enhancing hippocampal neurogenesis, synaptic plasticity and neurotropics. The problems can also be overcome using playing cards. Based on research studies conducted in Columbia and Sweden, playing cards can improve cognitive function and social interaction in the elderly. The positive effects of playing cards includes building social relationships, developing skills and cognitive thinking. The purpose of the research was finding out the effect of playing cards using the “tepuk nyamuk” method on improving cognitive function and social interaction in the elderly in a nursing home.

Method

Study Design, Setting and Sampling: The study was quasi-experimental. The samples consisted of 60 respondents (30 in the treatment group and 30 in the
control group) who were staying at UPTD Griya Werdha and Hargo Dedali nursing home in East Java, Indonesia. The inclusion criteria in this research was older adult who could sit. Those with hearing loss and older adults who were color blind were excluded. The research was conducted in the treatment group by providing cards played with the “tepuknyamuk” method 5 times over 2 weeks with a duration of 15 minutes taken for each meeting. The data was analyzed using the Wilcoxon signed and Mann Whitney tests.

Results

In the treatment group, the results for the cognitive function were higher than before (Table 1). The result of the statistics tests showed significant differences in the cognitive values pre- and post-test. These results indicate that the game can improve the cognitive function of the elderly, especially when based on the components of orientation, attention and language. The results of the Mann Whitney analysis showed significant differences in the cognitive values in the pre-test in both the treatment and the control group (Table 2). In the treatment group, there was a difference pre- and post-test in the components of social interaction concerning cooperation and conformity. Based on the results of the statistics test on the ability of social interaction, the treatment group showed a significant difference in relation to the cognitive values during the pre-post test. The results of the Mann Whitney analysis showed that there were significant differences between the social interaction skills pre-test in the treatment group and in the control group.

Table 1: Distribution of the cognitive function of the treatment group (n = 60)

<table>
<thead>
<tr>
<th>Category</th>
<th>Orientation</th>
<th>Registration</th>
<th>Attention</th>
<th>Memory</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>Healthy</td>
<td>11</td>
<td>17</td>
<td>29</td>
<td>29</td>
<td>14</td>
</tr>
<tr>
<td>Moderate</td>
<td>11</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Severe</td>
<td>8</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 2: Distribution of the cognitive function between the treatment and control groups (n = 60)

<table>
<thead>
<tr>
<th>Cognitive function</th>
<th>Treatment group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Healthy</td>
<td>14</td>
<td>46.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Severe</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Wilcoxon Signed Rank test</td>
<td>p=0.000</td>
<td>p=1.000</td>
</tr>
<tr>
<td>Mann Whitney</td>
<td>Pre test</td>
<td>p=0.000</td>
</tr>
<tr>
<td></td>
<td>Post test</td>
<td>p=0.000</td>
</tr>
</tbody>
</table>

Table 3: Distribution of the social interaction in the treatment group (n = 60)

<table>
<thead>
<tr>
<th>Category</th>
<th>Social interaction component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cooperation</td>
</tr>
<tr>
<td></td>
<td>Pre</td>
</tr>
<tr>
<td>Good</td>
<td>24</td>
</tr>
<tr>
<td>Adequate</td>
<td>4</td>
</tr>
<tr>
<td>Deficient</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 4: Distribution of the social interaction in the treatment and control groups (n = 60)

<table>
<thead>
<tr>
<th>Social interaction</th>
<th>Treatment group</th>
<th></th>
<th>Control group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Good</td>
<td>25</td>
<td>83.3</td>
<td>28</td>
<td>93.3</td>
</tr>
<tr>
<td>Adequate</td>
<td>5</td>
<td>16.6</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>Deficient</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wilcoxon Ranked test</td>
<td>p=0.000</td>
<td></td>
<td></td>
<td>p=1.000</td>
</tr>
<tr>
<td>Mann Whitney pretest</td>
<td>p=0.012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mann Whitney posttest</td>
<td>p=0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The respondents liked the game because they understood the flow of the game and the respondents were scrambling to be guides for their group team. This causes the respondents to understand the game training quickly and they will also often invite other respondents to stay focused and to practice continuously. The elderly who practice using their brain more often can slow cognitive decline. The brain can be stimulated by playing cards using the “tepuknyamuk” method that have many types of shapes as well as strategy-based game rules. All of these elements will stimulate the limbic system which will be processed by the hippocampus and amygdale. This is passed on to the cortex’s prefrontal. The stimuli that enters the prefrontal will stimulate the prefrontal to work according to its functions such as planning, organizing and solving problems. The prefrontal responses to thinking will affect the increase in cognitive function. “Tepuknyamuk” cards are one of the games that can improve cognitive function because of the elements of the game.

This research shows the influence of the orientation ability of the elderly. Orientation includes short-term memory. Short-term memory includes verbal memory, namely by assessing new memories about orientation and assessing the ability of the individual strategies to learning new things. Playing cards with the “tepuknyamuk” method was a game that was still unknown to the elderly because it used different methods and strategies to what they were used to. This meant that they had to practice their orientation skills. The provision of memory stimulation affects the level of orientation ability in the elderly. Playing cards are a good method for improving the orientation of the elderly because the games can make the elderly focus on what they were told. In this study, there was no increase in memory components and registration. All of the respondents pre-test were in the good category, so for the post-test, the value of memory function and registration remained 3. The limbic system is part of the amygdale, which functions to control emotions and memory processes by stimulating the hippocampus.

The limbic system stimulates aspects of memory and registers it in the cognitive function component. Information storage is a part of the synapses. Synapse facilities affect the subconscious mind processes which gives rise to perception or memory. The hippocampus is long-term memory that can store relatively permanent information. During the game, the respondent will recognize the stimulus of the playing cards based on the patterns and colors. This stimulation will stimulate the limbic system, especially the hippocampus, and encourage the recall of past memories of playing cards, the card patterns and the used colors. These elements on the playing cards can stimulate the brain so then it can improve short-term memory. The hippocampus is also a learning center that will continue to be honed through the method of “tepuknyamuk”. This should be carried out continuously so then it can improve cognitive function. Playing cards is entertaining because it is done together with fellow older adults and this can lead to happy and pleasant feelings.

Older adults who previously felt alone because they have not adapted to the environment and who rarely interact can feel happy as a result of the positive interactions that occur during the game. Giving them attention means directing the mind to something that needs to be learned and remembered. For example, remembering numbers and counting down. In information processing, memory involves the process of
encoding, storing and recalling. The results of the study showed that memory training for attention/calculation in the elderly is influenced by the processing speed and effectiveness of the strategies used to improve the elderly in terms of learning to memorize numbers, sequence numbers and counting down. Processing speed is influenced by several factors including age, education and verbal ability. Playing cards are a good method to improve attention/calculation, because from the game, the elderly can practice numbers and letters from the cards that are issued.

The working memory increased when the elderly completed the task in terms of language using a collection of word lists, naming and following orders. This was influenced because the ability of the elderly in relation to re-evaluating tasks in terms of language uses and learning strategies related to ways of thinking and taking action in different situations. Playing the cards is a good method to improve the language component of the elderly. This is because the game trains the elderly to follow orders from the guide.

The results of the study have shown an increase in the components of cooperation, competition, contradiction and conformation. The respondents were very happy with playing cards using the “tepuknyamuk” method because the respondents scrambled to be guides on their team and they exchanged stories during the break. This caused the respondents to motivate the other respondents to stay focused and to practice continuously. Through social interaction, the elderly can think more positively and optimistically about life. The elderly who play games more often experience a positive effect; one of them was tolerance between the players, which can improve social interactions in the elderly.

The results of the study showed the effect on the ability of cooperation in the elderly, with the existence of the game requiring the elderly to work together in groups. According to smartphones and e-tablets in perioperative medicine, the existence of good cooperation allows the elderly to get a sense of belonging to a group. They can share stories, interests, concerns and they are able to engage in creative and innovative activities together. Playing cards are a good method to improve cooperation with the elderly because this game requires collaboration. Collaboration means staying in harmony with each other, cooperating to motivate each other and reprimanding if there is a loss of focus. The results of the study showed the effect on the component of competition. The results of the study ‘Adequacy of Sample Size in Health Studies’ said that social interaction decreases when it is supported by the attitude of the elderly, who tend to be selfish and unwilling to listen to the opinions of others. This causes the elderly to feel socially alienated which ultimately feels useless because there is no emotional distribution through socializing. Playing cards using the “tepuknyamuk” method was a good method to increase social interaction in relation to the component of competition, because the game trains speed and focus so as not to lose at playing. The results of the study showed an increase in the component of good contradiction or opposition. Good opposition can be interpreted where the respondent never scolded the elderly. The more frequent the interactions, the more likely that there will be conflict or problems. As the game progresses, the elderly do not experience opposition - this affects the ability of social interaction when it comes to trying to be better.

The results of the study showed that the majority of the treatment group experienced an increase in the component of conformity. Older adults who are active in social activities are more likely to adjust to aging well. If the elderly are active within a social involvement, then the elderly can reduce cognitive decline through the appreciation and good treatment of the environment. Playing cards using the “tepuknyamuk” method was good for increasing social interaction in the component of compatibility because the game has the effect of adjusting to one’s peers and the surrounding environment. The results showed that by playing “tepuknyamuk” for a short duration (2 weeks) and frequently (10 times a meeting), this can improve cognitive function and social interaction in the elderly. Based on the functional consequences theory, the elderly will experience age-related changes and have risk factors that make the health of the elderly decline. The results showed that playing cards using the “tepuknyamuk” method is effective at increasing cooperation and conformity. It improves the cognitive function that occurs because the elderly individuals are actively participating in the game.

**Conclusion**

Playing cards using the “tepuknyamuk” method proved that even short frequency games and durations for the meetings can improve cognitive function and social interaction. The results proved that playing cards are more effective at improving cognitive function in reference to the components of orientation, attention and language.
Social interactions are more effective at increasing cooperation and conformity. Playing cards can be done regularly to maintain the cognitive function of older adults. Further studies are strongly recommended to explore the relationship between recreational activities that may affect the cognitive functioning of the elderly.

**Ethical Clearance:** The study passed the ethical review and obtained an Ethical Approval certificate No. 1190-KEPK issued by the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga.

**Source of Funding:** This research obtained funding from the Faculty of Nursing, Universitas Airlangga.

**Conflict of Interest:** The authors declared that they have no conflict of interest.

**REFERENCES**


Motivational Interviewing as a Problem Solving Intervention to Improve Adherence: Review of the Related Literature

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²Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Patient behavior changing through adherence therapy is very difficult. Identifying the most effective approach is very important regarding adherence. Motivational Interviewing (MI) is a clinical approach involving communication, collaboration, evocation, autonomy and increasing motivation alongside the final results of behavior change. The principles underlying MI include empathy, developing differences, avoiding debate and supporting self-efficacy. MI interventions allow for the changing of the relevant cognitions and self-regulation processes that leads to adherence to the treatment.

Method: A literature review was conducted focused on journals published between 2013 and 2018. Fifty relevant journals were obtained and data was extracted from 25 relevant selected journals. The search was carried out by entering the keywords ‘adherence’, ‘motivation’ and ‘MI’ into the SCOPUS, ScienceDirect, Sage, ProQuest, Elsevier, SpringerLink and Google Scholar databases.

Conclusion: MI studies show that MI-based interventions are effective in promoting health behavior changes. It is also associated with positive health outcomes such as low blood pressure, diet, decreased smoking, lower cholesterol, and better blood sugar control.

Keywords: adherence, motivation, MI

Introduction

It is very important for clients to change their behavior in order to undergo success within the therapy program. Adherence is defined as the client’s decision to receive and follow instructions related to the stated regulations. In the regulation of chronic medical conditions, bad adherence leads to worse results in the context of medical care, higher rates of hospitalization and increased health care costs. Adherence can be said to be “a key mediator between medical practices and client outcomes”. The strategies to improve medication adherence must involve clear and specific information. The average level of non-adherence is about 50% and this results in a large use of funds in the context of health care costs per year. Motivational Interviewing (MI) has proven to be more effective than other strategies, such as traditional informative strategies. It has been shown to be as effective as adherence cognitive therapy but with fewer time costs.¹

MI is a clinical approach used to increase the motivation of the clients to change by helping them in exploring and solving their ambivalence and resistance toward changes in a client-centered approach. MI is a goal-oriented communication method.² MI is a patient-centered care approach to maintaining the intrinsic motivation in all individuals formed between the clinician and the client. The clients are guided towards goal setting, identifying potential barriers, and increasing self-efficacy and commitment to achievement goals. Patients articulates their ideas and plans rather than communicating so to their health care providers. The role of health care providers is to facilitate, not dictate, and what may have felt like the struggle now is cooperation and egalitarian relationships. MI was originally developed as a model for treating substance abuse, but it has now been modified for other cases. MI uses open questions, reflection and understanding the personal nature of the clients. It also involves partnerships
with anyone in the medical setting. The MI technique is portable, low-tech and it can be integrated into the existing consultation model. MI-based interventions are short, consisting of three sessions which last for 20 to 30 minutes each, followed with another over the telephone. The interventions are managed by nurses in the client’s own home which is conducted when are doing home care visits.

Readiness for change is defined as a processor state of movement between no intention to make changes in behavior to committing and maintaining behavior change. MI follows positive results in other health care domains with respect to behavior change.

Method

Study Design, Setting and Inclusion criteria: The method used a search process by entering the keywords ‘MI’, ‘motivation’ and ‘adherence’ on databases such as SCOPUS, ScienceDirect, Sage, ProQuest, Elsevier, SpringerLink and Google Scholar. A screening of the articles was done. The purpose of this study was to see the extent to which MI interventions affect client adherence to therapy. The inclusion criteria used in this literature review was articles in the year range of 2013 - 2018. The articles used were articles that had been published internationally of a standard level 1 - 2 (including RCTs and R randomized). All of the articles were written in English.

Data Analysis: The data analysis was conducted by collecting the articles that used a quantitative design focusing on diabetes mellitus, cardiovascular disease, alcohol dependence, mental illness and schizophrenia, chronic disease, HIV disease and kidney failure.

Results

There were a total of 50 articles obtained from the search strategy, evaluation and methodological assessment. Of this total, 25 articles did not meet the study criteria and thus were dropped out of this study. The aggregation of the review of the quantitative design articles showed that the results were grouped through the MI in the areas of diabetes mellitus, cardiovascular disease, alcohol dependence, mental illness and schizophrenia, chronic diseases, HIV disease and kidney failure.

A. Clients with diabetes mellitus: The research conducted by Chlebowy et al examined MI as an intervention to improve the degree of health and adherence of therapy of the clients with cardiovascular problems. The study findings were that MI affected drug adherence and the diabetic markers. Other studies from Boved-Fontan et al found that MI conducted by health workers aimed at clients with dyslipidemia achieved significant reductions in all lipid parameters, cardiovascular risks, weight reduction and dietary adherence. The study’s MI was therefore a problem solving treatment that could reduce type 2 diabetes and cardiovascular disease risk in real life. The intention to treat and the following analysis showed there to be a significant difference in the outcomes between the two groups. The strengthening of the MI interventions in diabetes mellitus clients was examined by Moura et al, which states that the clients reported an increase in care over a 6-month period in the quality of the diabetes care received. It was reported that there was an increase in their level of physical activity, fruit and vegetable consumption and medication adherence. Another study found that MI is not a single intervention. It covers a variety of specific techniques to encourage behavior change and it requires training and time to come to fruition. The results of the study support the adoption of MI.

B. Clients with cardiovascular disease: A previous study conducted by Al-Ganmi et al was based on RCT studies. The client conducted a brief semi-structured interview to identify the level of adherence to treatment and to determine the predictive factors for non-adherence. The results showed that MI led by nurses had the potential to increase the adherence of therapy. Another study by Hardcastle et al reported there to be significant differences between the obese client group and hypercholesterolemia at baseline, thus showing a significant increase in BMI and cholesterol level between the intervention and control groups. From the results of the study, it can be concluded that low intensity MI counseling interventions are effective at bringing long term changes to some, but not all, health-related outcomes. Other studies took on the subject population of 1,704 participants and this total was randomized to
receive MI interventions delivered by healthy lifestyle facilitators trained in a group, in individual formats or ongoing their usual care. The primary results showed changes in weight and physical health. Secondary outcomes included changes in the low-density lipoprotein cholesterol and Cerebro Vascular Disease (CVD) risk scores.

C. Clients with HIV disease: The study by Ekwunife et al. was conducted in six hospitals offering HIV care. The participants were randomized for the population of the intervention and control groups. The structured adherence support scheme was called the ‘Incentive Scheme’. The findings prove that applying conditional economic incentives combined with MI can increase the retention and adherence of ARV consumption among HIV patients. Other studies have developed a project called IMPACT (Individuals Motivated to Participate in Adherence, Care and Care). It is a multi-component approach for newly incarcerated HIV-infected people that specifically targets treatment, retention and medication adherence by overcoming various obstacles in terms of treatment involvement. Research by Sued et al. showed that the doctor-based MI intervention was feasible and effective at improving and maintaining client adherence, viral suppression and client-doctor communication and attitudes about the treatment.

D. Clients with psychological disorder: A research study by Mallisham and Sherrod emphasized the enthusiasm and MI intentions in training programs used to produce translations of newly acquired knowledge into nursing practices. The results showed that MI can develop meaningful, client-centered communication skills and that this can lead to improved medication adherence. Another study by Barkhof et al. consisted of a randomized controlled study including 114 clients who experienced psychotic relapses due to medication non-adherence within the past year. The participants received an adapted MI form or an active control intervention in the form of health education (HE). The results showed that MI improved treatment adherence in previously non-adherent clients who experienced a psychotic relapse. The study focused on medication adherence in patients with schizophrenia and the researcher conducted a qualitative case study of several MI sessions to analyze the interaction processes that affects motivation in clients with schizophrenia. The results found there to be three success factors for MI-based interventions, which are the relationship of trust between the client and the therapist, the ability of the therapist to adapt his MI strategy to the client’s processes and linking client values with long-term treatment adherence. Another researcher conducted a study on sixty-four outpatient clients and conducted 2 MI sessions focused on cognitive function. The condition of MI is associated with a great improvement in task-specific motivation along with the presence of larger training sessions. The results of interview-based motivational interventions for people with schizophrenia can be effective at reducing symptom severity and hospitalization, and it can increase medication adherence, functions and insights into both diseases and treatment through the medium term (six months) follow-up period. In this study, n = 1,000 adolescents were screened and adolescents with results indicating anxiety or depressive symptoms (n = 162) were advised to seek psychological health care in the group. The result showed that the MI results need to be offered to adolescents to function as models to optimize their health care management in daily clinical practice.

E. For clients with alcohol disorders: A study by Crane et al. involved 60 offenders who were randomly asked to attend a brief motivational interview (BMI) session or control intervention before the start of their treatment. The findings showed that binge drinkers had a lower medication adherence than the participants who did not binge-drink. The BMI participants who binge-drank attended more treatment sessions and were proved to have lower dropout rates than the binge-drinker control participants. Other studies have quantified the extent of MI in terms of adherence to a reduction in alcohol consumption and drug use. Three contexts of general MI research evaluate the efficacy of MI, the effectiveness of MI and MI training. The results show that MI adherence is usually the lowest and most varied in the context of evaluating MI training and conversely, that adherence is usually the highest and lowest variable in the context of evaluating the efficacy and effectiveness of MI.
F. Research on clients with kidney disease: A research study by García-Llana et al was conducted to determine the effectiveness of individuals in the context of pre-dialysis intervention programs (90 minute monthly sessions over a 6-month period) in terms of adherence, their emotional state and quality of life as related to health (HRQL). The results showed that after the intervention, the clients reported significantly higher levels of adherence, lower levels of depression and anxiety and better HRQL.

F. Research on chronic diseases: The study was conducted by Mutschler et al. The purpose of the review is to understand how MI works to change the behavior of teenagers. Results: based on SDT (self-determination theory), three mechanisms were found in the studies that were reviewed, including competence, linkages and autonomy. Other researchers found there to be effectiveness in MI-based pre-treatment in the context of pain rehabilitation. Another study was conducted on 1000 adolescents with this single-center approach. Adolescents were screened if their results indicated anxious or depressive symptoms (n = 162). The results showed that MI for adolescents can serve as a model for optimizing health care management in daily clinical practice. Other studies obtained results indicating that MI techniques that can provide effective and essential costs in terms of functional activities, thus reducing the rate of decline in quality of life. Research by Pirlott et al addresses the counselor’s enthusiasm, empathy and global direction, as well as calculating the behavior that is consistent with MI which correlates significantly with an increased intake of fruits and vegetables.

Discussion

The main components of MI are RULE. MI has four guiding principles, represented by the aforementioned acronym. “R” stands for “resisting the righting reflex.” Reflecting righting occurs immediately when showing the risks or problems with the client’s current behavior. “U” is to “understand client motivation”. Clients have their own reasons for adhering to behavior changes. “L” stands for “listening.” Listening involves more than just using one’s ears to hear the words that the client says. Listening is not the same as asking. “E” stands for “empowering clients”, in order to explore the clients’ ideas about the changes that they can make to improve their health. Empathy is an important skill in MI. Empathy does not judge and it does not indicate that the counselor always agrees with the client. It demonstrates how the counselor can be patient. The approach to the MI’s skills is represented by the OARS acronym: open questions, affirmations, reflective listening and summaries. Open questions are unstructured and do not suggest a response. Affirmation is a statement that recognizes the strength of the client and this helps the counselor to create relationships with their clients. Listening or reflecting reflectively is another important MI skill. Using reflection allows the counselor to convey the counselor’s understanding of the client’s situation and to make the client feel understood.

Conclusion

MI is an interview style designed to promote behavior change and it is defined as a set of targeted communication skills to motivate clients to change their own behavior in the interest of their health.

Ethical Clearance: None

Source of Funding: None

Conflict of Interest: None

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Parent’s Experience of the Grief-Loss Process with Children with Leukemia

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ABSTRACT

Leukemia brings in changes in a child’s psychology that results in losses for the parents. The purpose of this research was to draw out and interpret the loss and grief process of parents whose children are suffering from leukemia. This research applied a phenomenological qualitative research design. The informants were parents whose children were suffering from leukemia. The instrument of this research was the researcher. The data gathering technique used consisted of in-depth interviews. This research was located in the Bona room of Dr. Soetomo General Hospital in Surabaya. We analyzed the data through triangulation and the sources used were reference materials. The result showed that the parents were shocked and in a state of disbelief at first, even going so far as to reject what had happened. The parents blamed themselves and were angry at everyone. Words cannot express their deep grief, and they tried to accompany their children every moment possible. The parents whose children were suffering from leukemia encountered loss and were going through a grieving process. The nurses were given the suggestion of giving the parents a chance to express their grief.

Keywords: experiences, parent, grief-loss, children with leukemia

Introduction

This research aimed to explore the coping mechanism of parents whose children were suffering from leukemia who experienced loss and the grief process in the children’s room of Dr. Soetomo General Hospital in Surabaya, Indonesia (RSDS). Among the 100 children there, it was confirmed that 4 of them were suffering from leukemia.1 The most common type of blood cancer was Acute Lymphoblastic Leukemia (LLA).2

The prevalence of cancer was 4.3 per 1,000 inhabitants in Indonesia. Cancer was ranked seventh among the causes of death (5.7%).3,4 Leukemia constituted one-third of all malignancies in both children and adolescents.4

The number of cancer incidences in children at the RSDS has increased year to year. In 2015, there were 106 new cases and in 2016, there were 108 new cases.2

Leukemia can be described as a blood cell malignancies originating from the bone marrow, marked by the proliferation of white blood cells and impaired leukocyte regulation with the manifestation of abnormal cells in the peripheral blood. Ugrasena stated that leukemia is probably caused by chemical and physical substances. Children are quite susceptible to consuming foods and drinks that are comprised heavily of preservatives.5

The psychological impact that was felt by children who suffered from leukemia was something complicated. The long process that children who suffer from leukemia go through certainly brought in drastic emotional changes for the children who experienced sadness, difficulties in losing a battle and the potential pathway to death.5

The parents whose children were suffering from leukemia generally felt guilty or anxious because they felt responsible for what had happened to their child. In sadness, some even hoped to take the place of their
child. They tried to reduce the suffering of their children and sought to prepare their kids for death. The parents need support from everyone.⁶

The results of the study found that the parents were not informed about this as an “important problem.” Even though doctors might not be able to predict the precise moment that their children die, any information about that from another parent’s first-hand experiences could help them prepare for it.⁶

Leukemic children who die experience many pathways of death. The parents accompanied them and then grieved after their child’s death, even to the point of ending their own lives. Understanding the similarities and differences in the pathways to child mortality and their parents’ experiences is an essential foundation given the various palliative, end-time and loss services needed to help both the children and parents.⁷

Besides, it is necessary to remember that for life-threatening illnesses that are not always fatal, we are not always able to distinguish between the children who died and the children who survived at the time of diagnosis, whether during the initial treatment or even after the first event if the treatment has failed. This uncertainty increased the challenge and importance of understanding how to integrate aspects of palliative treatment from the time of diagnosis.⁸

Wolfe and their colleagues (2000) reported that parents whose children were suffering from cancer stated that, in the last month of the children’s life, their children were quiet or they felt unpleasant (53 percent), more than a few of them were sad (61 percent), some of them not particularly calm and peaceful every time (63 percent) and they were scared more often (21 percent). Regardless of the suffering that their children experienced at the end of their life, 70 percent of the parents described the death of their child as “peaceful”.⁹

The nurses became essential to helping the clients through the period of grieving and they sought to restore their self-function to as they were before. The nurses had to be trustworthy guides for the client. The nurses had to examine their attitudes, maintain an attentive presence and provide a psychologically safe environment so then the clients could express their feelings. The effort of the nurses in maintaining an attentive presence could be made certain by using open body language such as standing or sitting with their arms down, facing the client and maintaining adequate eye contact, especially when the clients were talking. The next effort was to create a psychologically safe environment by ensuring that the client felt that they had confidentiality, where the nurse stopped giving individual advice and where they gave the clients the freedom to express their thoughts and feelings without the feeling of being afraid of being judged.⁸,¹¹

Method

Study Design, Setting and Sampling: This study was descriptive and qualitative with a phenomenological design. The participants of this research were the parents of children suffering from leukemia who were undergoing treatment at the children’s IRNA RSDS in August 2018.

The inclusion criteria for the participants in this study was that they were the parents of leukemic child patients who were undergoing treatment at the IRNA of the RSUD Dr. Soetomo Hospital, Surabaya with or without complications, leukemic pediatric patients who had been diagnosed with leukemia for more than or equal to 3 months, leukemic children who were more than 2 years old and parents who were 20 to 60 years old.

The number of participants in the phenomenology study totaled 11 people who agreed and signed an Informed Consent form after the purpose and focus of the study was explained. The sampling technique used was purposive sampling and the data collection techniques used were an observation and in-depth interviews. The research instrument used was the researcher as an individual. The research used their field notes and they additionally conducted audio-visual records that supported the participant’s information.

Study Variables: The parents experiencing the grief and loss process felt refusal, anger, bargaining, depression and acceptance.
The causes of grief and loss in the parents regarding their children who were suffering from leukemia allowed the researcher to obtain several sub-themes.

**Data Analysis:** The data was processed using a word processing application, making it easier to import the processed applications and data text analyzers to further classify the themes (variables), categories and sub-categories (coding) and to find keywords that directly pointed to the quotations of the participant’s statement (script). The processing and analysis of the transcript data in the form of text was done with the Free - General Public License (Free - GPL) QDA Miner 5.0 application.

The validity of the data carried out through triangulation was done using sources, data and multiple methods. The triangulation of the data sources used was from the nurses who were in charge of the Bona I IRNA Child Care room at Dr. Soetomo General Hospital, Surabaya.

The triangulation method was done using a voice recording, field recording and video recording. The recordings are listened to and then played back over and over before the transcripts were made. The data was re-matched with the participants’ expressions and gestures during the interview, and then the transcripts were printed and stored.

**Results**

All of the participants were parents who took care of their children with leukemia. We excluded a 10th participant who was a grandmother who treated leukemia patients. All of the participants were female in the age range of 28 to 48 years old. The level of education started from elementary school or madrasah ibtidaiyah and went up to junior high. The occupation of the participants consisted of 4 farmers, 3 traders, 3 private employees and 1 advocate.

The leukemia child patients were as many as 11 children; 8 males and 3 females. The age of the leukemic children was between 5 years and 19 years old. The duration of the illness varied from 4 months to 48 months (4 years). Three patients were single children, 4 patients were the second child out of 2 siblings and 4 other children had 2 to 3 siblings.

The presence of children was a complement to the happiness and integrity of the family. A child diagnosed with suffering from leukemia prompted an unfortunate process of sadness and loss in the family. Some expressions of grief and loss experienced by the parents were refusal, anger, bargaining, depression and acceptance.

**1. Shock, Disbelief and Refusal:** There were 9 participants out of the total of 11 participants who said they felt denial, disbelief and shock when they found out that their child had been diagnosed with leukemia by a doctor. The following was revealed by nine of the participants:

“... First, I was shocked and in a state of disbelief. I was not expecting it… it was anemia for a month and then suddenly, it was leukemia. I was sad but I was shocked (crying)” (P8)

“... At first, I did not know what the doctor told me about leukemia, I said to the doctor, “Don’t you dare to say it, doc ... why must it be my child that suffers?”... “ (P9)

**2. Anger:** Usually, after the rejection, there is the angry phase. The expression of the participant’s anger was not revealed to the officers or others but it did come out in the form of jealousy of others, such as the expressions of the five participants:

“... My first thought was, ‘How come it was my child?’ I want to express my wrath. Every day, the wellness of my child keeps dropping, even when my child took the potion and was undergoing chemotherapy. I was felt hollowed ...

“... I started crying every day and I feel like I do not deserve my child suffering. How come it is not someone else’s child? I could not stand this ...

**3. Bargaining:** Some participants, as many as seven people, experienced a stage of bargaining. The participants expressed acceptance and sincerity regarding the condition of their children but they were still hesitant and hoped for a miracle that could cure their children even though they realized that it was very difficult.

“... God is indeed fair, but why is it that I have this disaster? I believe there is wisdom behind this disaster even though it is not here but it will be later in heaven. I must be optimistic and be ready if there is something ahead. I cannot help but be prepared ...

“ (P9)
“... I do not feel that I deserved it, and then I had the effects of the chemotherapy explained --- that many have recovered and many have died. When I was told that it was by chemo, I postponed it for ten days, I was still trying to use herbal medicine, but there was no result. Finally, I signed for chemotherapy ...” (P11)

4. Depression: Depression can arise after the bargaining stage. Not all of the participants experienced this stage. Four participants experienced this stage, namely participants two, three, seven and eleven.

“...Even in this time, I still feel sad and anxious ... my child is not even an adult. Sometimes my child could fall ill and suddenly die ...” (P3)

“...I have been sincere about what will happen to my child. For five days, I was desperate; there was only a sense of heartache. It is hard to accept sincerity from the origin smoothly ...” (P7)

5. Acceptance: The parents whose children were suffering from leukemia totaled as many as 7 participants who were at the acceptance stage. This was as expressed by the following participants:

“...Now I just look on the bright side... as long as it is the best for my child to follow all of the procedures...” (P2)

“...I resigned myself; hopefully, my child is given strength and healing. Now I follow the procedures and surrender to God for giving me a test. What my doctor says, I follow. I am standing ready if there is anything...” (P11)

The causes of grief and loss in the parents whose children suffered from leukemia involved:

1. Uncertain child condition: The deteriorating condition of the child was the cause of participant grief, such as the following expression:

“... The condition of my child is increasingly dropping. Sometimes my child was unstable when taking medication or when going through chemotherapy. I do not have the heart for that...” (P5)

“... Now my child has relapsed. I hope that my child is strong. My child said, “how tired I was like this, how come my illness is not lifted?...” (P10)

2. Loss of child: Three of the participants stated that the cause of their grief and the loss that they expressed was that they were afraid of losing their child. This was as revealed by the following participants:

“... There was a fear of losing my child first ... (the sentence was interrupted, the sentence was not finished and they were holding back tears) because I have seen my child’s peers now, who have had the same treatment... many of them have died...” (P1)

“... there is an anxiety of losing my child, even though the medication is free...” (P4)

3. Could not go to school: Six participants revealed the cause of their grief. The loss felt was that their children wanted to go to school but they could not. This was stated as follows:

“...My child should go to school and play like others, but now he is far from his family...” (P5)

“...It has been three months in the hospital. My child said, “O mother, I cannot go to school anymore Bun, can I?” (P8)

4. Only child: There was a participant who revealed that the cause of his sadness was being a single child patient, namely:

“... My child was my only and favorite child, and now they have fallen sick...” (P7)

5. The family falling sick: There was also the presence of family members who are at home with the children who have also fallen sick, which caused grief and loss in the parents. The 7th and 11th participant’s statements were as follows:

“... Mother and Father at home are also sick, and it made me think. My physical presence here is to take care of the child but my mind is at home and it is also thinking about my parents, who are also sick...” (crying) (P7)

“...my mind was not calm. I felt sad because his grandfather also had had a stroke and no one took care of him. I have to take care of their grandchildren here...” (P11)

Discussion

The parents whose children were suffering from leukemia experienced grief and feelings within the loss...
process ranging from disbelief through to rejection, anger, bargaining, depression and acceptance. Uncertain health conditions cause the children to not play or attend school.

These following were suggested should be tried to express the feeling of grief and loss openly to nurses so that it could relieve the psychological burden, tried to keep providing play and school activities according to the patient’s abilities. The nursing services have to maintain excellent communication. They were expected to meet the psychological needs of the children when it came to playing and they also sought to encourage the children to attend school while in the hospital.

**Conclusion**

The parents of leukemic children in Dr. Soetomo Hospital experience grief and loss processes including rejection, anger, bargaining and depression.

**Ethical Clearance:** This was obtained from KEPK; RSDS Number 0455/KEPK/VIII/2018 on 7th August 2018

**Source of Funding:** The Ministry of Health Indonesia, that was not involved in study design, data collection and analysis, and in the decision to submit the article for publication.

**Conflict of Interest:** None

**REFERENCES**


The Relationship of Social Support with Older Adult Depression in Hargo Dedali Nursing Home, Surabaya

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ABSTRACT

Older adults are vulnerable to health problems including depression caused by stress when facing changes in their life, such as retirement, illness, disability, placement in a nursing home, the death of a partner and the reduced availability of social support. This study aimed to explain the relationship of social support with the incidence rate of depression in older adults in Hargo Dedali Nursing Home, Surabaya. This research used a correlational design with a cross-sectional approach. The sample consisted of 20 older adults who lived in Panti Werdha Hargo Dedali Surabaya who were selected through purposive sampling. The independent variable was the social support of the older adults while the dependent variable was the incidence rate of depression. The data analysis used was Spearman rho with \( p = 0.037, r = -0.468 \) and a significance level of \( \alpha <0.05 \). There was a significant relationship between social support and the incidence of older adult depression in Hargo Dedali nursing home, Surabaya. The higher the level of social support, the lower the incidence of older adult depression. Health workers, especially nurses, can improve their competencies in order to provide health services to the older adults, especially when related to the provision of social support and the anticipated incidence of depression in the nursing home.

Keywords: social support, depression, older adult, nursing home

Introduction

Progress in the field of health and increasing socioeconomic welfare has an impact on the increasing life expectancy, which is one indicator of the success of development. Life expectancy has increased the population which causes the number of older adult people to continue to increase from year to year. For five decades, the percentage of older adult Indonesians has doubled (1971-2017) to 8.97 percent (23.4 million). This rapid increase means that Indonesia has entered an era of having an aging structured population. Increased life expectancy is related to the number of diseases and psychological disorders that manifest in the older adult, one of which is depression. The psychological mental disorders that are often found in the older adult are depressive disorders, cognitive impairments, phobias and alcohol use. In addition, an increase in the number of older adult people who are not followed by an increase in the efforts to provide adequate social support will have an impact on the increasing number of dependents towards the productive age population (old dependency ratio). The burden that must be borne by the population of a productive age will increase. Meanwhile, high stressors and unpleasant life events can lead to the possibility of the older adult experiencing anxiety, loneliness and depression. Depression symptoms in older adults are often ignored and not addressed because of the low level of social support. However, research related to social support and depression in the elderly living in nursing homes is still rare.

Data on the prevalence of depression in older adults in Indonesia is quite high. The incidence of acute geriatric space was 76.3%, with the proportion of geriatric patients who experienced mild depression being 44.1%, with 18% for moderate depression, 10.8% for major depression and 3.2% for very severe depression. Another study conducted by Wada et al focused on older adult in two cities on the island of Java. The data obtained...
showed that 33.8% had depression. Dedali Hargo Panti Surabaya cares for 40 older adult people. All of the older adult have a family. The results of the preliminary study conducted by the researchers on 5 older adults were that 3 said that they were rarely visited by their relatives. Two older adult people said that they felt sad if they were not visited by their family and 1 older adult person said that their fellow residents and caregivers were their family now.

Aging will cause physical and psychosocial changes. Physical deterioration is characterized by a decrease in the functioning of the five senses and a decrease in immunity, leading to various diseases. Psychological setbacks include feeling useless, being easily sad and feeling depressed. Social setbacks include the absence of relatives who can provide assistance, a lack of economic ability, feeling unproductive and no longer being able to play a role in society.

Depression is most common in older adults, although it is not part of the aging process. There are several factors that influence the occurrence of depression in older adults, namely demographic, biological, psychosocial, economic and religiosity factors. The demographic factors included being of the female sex, being single in terms of their marital status and feeling stress in their life. The biological factors in the older adults that can increase the risk of depression include suffering from a chronic disease, sensory disorders, impaired physical mobility, cognitive decline and other physiological changes that are a result of aging. Having a low income and being in a state of economic difficulty are some of the economic factors that contribute to increasing the risk of depression in older adults.

Syamsuddin said that an older adult person wants to live with their family, especially their nuclear family, and they want to get good care from them. However, due to several factors, the older adults do not get care from their family, such as having not had children, of having had children but their offspring died, the child went to their in-laws instead, the children did not want to be bothered by taking care of their parents or the children being too busy. For some older adult people, living in a nursing home is not the best choice. On the contrary, it becomes a better choice that is sometimes sad. Older adults who get long-term care have a higher incidence of depression than in regular society.

Increasing the social support for older adults will give the individuals a feeling of comfort, of feeling loved when experiencing depression and assistance in the form of enthusiasm, empathy, trust and attention so then the individuals who receive it feel valuable. Johnson and Johnson stated that social support is the existence of other people who can be relied upon to provide assistance, enthusiasm, acceptance and attention so as to improve the welfare of the individual. Positive social support can restore their physical and psychological condition. Familial and environmental social support is very important in the process of healing and in the recovery of patients. Therefore, this study aimed to explain the relationship of social support with the incidence of depression in the older adults at Hargo Dedali Nursing Home Surabaya.

Method

This study used a correlation design with a cross-sectional approach to determine whether or not there is a relationship of social support with the incidence of depression in the older adults in Surabaya Dedali Hargo Nursing Home. The number of samples in this study totaled 20 people. The selection of the samples was based on the following inclusion criteria: 1) can read and write, 2) can communicate verbally and 3) cooperative. Meanwhile, the exclusion criteria were 1) in special care, with a serious illness or on bedrest.

The independent variable in this study was social support and the dependent variable was the incidence of depression in older adults. The researcher used a short form of the Geriatric Depression Scale (GDS) questionnaire to measure the dependent variable. The independent variables were measured using a social support questionnaire that assessed the four types of support, namely emotional, instrumental, informational and reward. The results of the depression assessment using the Geriatric Depression Scale (GDS) questionnaire short form and the value of the Social Support questionnaire were analyzed using the Spearman rho test using a degree of significance (level of significance). The result was p < 0.05, which means that there was a significant/significant relationship between the independent variables and the dependent variable. The incidence of errors tolerated in this study was 5%.

Results

Hargo Dedali Nursing Home is a private nursing home. Every new older adult in the Nursing Home will go through a trial period for 3 months to maintain comfort. If there is a new older adult person who is perceived as disturbing the peace between the older
adult and influential over the other older adults, based on the institution’s policy, they would forcefully repatriate the older adult back to their family.

The demographic characteristics of the respondents showing their recent education history, age, marital status, the presence or absence of family outside the institution and if they had a long occupancy in the nursing home has been presented in Table 1.

Table 1: Demographic characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristics</th>
<th>Criteria</th>
<th>f</th>
<th>%</th>
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</thead>
<tbody>
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<td>1.</td>
<td>Education</td>
<td>No school</td>
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<td>15</td>
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<tr>
<td></td>
<td></td>
<td>Elementary school</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Junior high school</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>College</td>
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<td>30</td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
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<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Age</td>
<td>60-74 years</td>
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<td></td>
<td></td>
<td>79-90 years</td>
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<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;90 years</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
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<td>100</td>
</tr>
<tr>
<td>3.</td>
<td>Marital Status</td>
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<td></td>
<td></td>
<td>Widow</td>
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<td>95</td>
</tr>
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<td>Total</td>
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<td>100</td>
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<tr>
<td>4.</td>
<td>Families outside the Nursing Home</td>
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<tr>
<td>5.</td>
<td>Length of stay in the Nursing Home</td>
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<td></td>
<td></td>
<td>&gt;1 year</td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1.1 describes the characteristics of the respondents. Most had a history of tertiary education. The age of the respondents was mostly between 79 - 90 years old and the marriage status of the majority was that of widowhood, for 19 people (95%). All of the older adult people had family members who lived outside of the nursing home. Most of the older adults had lived in the home for more than 1 year.

1. Social support for older adults

Table 2: Social support for the older adults at the Hargo Dedali Nursing Home in Surabaya

<table>
<thead>
<tr>
<th>Level of support</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>Sufficient</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Less</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

The table above shows that the majority of the older adults feel that they get a good level of social support, totaling as many as 9 people (45%) in the residential neighborhood. There were older adult people who felt that they got enough social support, as many as 8 people (40%) and those that felt that they got less social support totaled as many as 3 people (15%).

2. The incidence of depression in older adults

Table 3: Depression in the older adults in the Hargo Dedali Nursing Home in Surabaya

<table>
<thead>
<tr>
<th>Event of depression</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td>Mild</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Moderate</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

The table above shows that most of the older adults were included in the normal category for as many as 14 people (70%).

3. Relationship of social support with the incidence of depression

Table 4: Analysis of the relationship of social support with the incidence of depression in the older adults in the Dedali nursing home in Surabaya

<table>
<thead>
<tr>
<th>Social support</th>
<th>Event of depression</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>Σ</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>8</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Mild</td>
<td>5</td>
<td>25</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>14</td>
<td>70</td>
<td>3</td>
<td>15</td>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

Spearman Rho $r = -0.468, p = 0.037$

The table above shows that the older adults who feel that they get good social support within the normal category (not depressed) total as many as 8 people (40%). Older adults with enough social support totaled 5 people (25%) did not experience depression and 1 person (5%) experienced mild depression. Leading on from this, 2 people (10%) had moderate depression. For the older adults with less social support, 1 person (5%) was categorized as normal (not depressed), 2 people (10%) were categorized as experiencing mild depression and
3 people (15%) were categorized as having moderate depression. The analysis conducted using the Spearman rho statistical test obtained a significance value of $p = 0.037$ of $\alpha <0.05$. This shows that there is a significant relationship between social support and the incidence of depression. The Spearman rho correlation value of 0.468 shows that the direction of the negative correlation has an inverse relationship with sufficient correlation coefficients.

**Discussion**

Social support refers to the attitudes, actions and social acceptance of sick patients. Social support enables their social functioning to the fullest and this can improve their level of adaptation in terms of their social health. The social support felt by the older adults in Surabaya Hargo Dedali Nursing Home was mostly good for as many as 9 people (45%), although there were older adults who felt that they had less social support (as many as 3 people). The aging process requires support from the surrounding environment, both from the nursing home, fellow residents and from the families living outside the orphanage. The aging process in the older adults is a change that is related to time; it is universal, intrinsic, progressive and detrimental. This situation can lead to reduced adaptability to the environment. Most of them were aged 79 - 90 years old. Someone who is over 70 years old or older is a high risk older adult person.

Older adults need social support to go about their daily lives. The types of social support, according to Wills and Ainette (Baum et al., 2012), can be divided into 4, namely emotional support, appreciation, instrumental and information. The support needed by each individual is different depending on their needs. Social support is not merely about providing assistance; it is about what is important according to the perception of the recipient’s meaning of the aid. This allows the older adult to feel more emotional supported and appreciated because they feel the benefits of the assistance for themselves.

Most of the respondents did not experience depression (normal) (14 people, 70%). There were 3 people (15%) with moderate depression and 3 people (15%) experiencing mild depression. The incidence of depression varies so much that depression is known according to the symptoms, which are mild, moderate, severe and with or without psychotic characteristics. Older adults who did not experience depression (normal) were able to accept changes in their bodily condition according to the aging process experienced. Most of the respondents considered that life is something fun. There were 3 respondents who were experiencing moderate depression (respondents no. 6, 8, 10). The respondents felt dissatisfied with the life they were experiencing, lost interest in activities and felt bored.

There was a relationship between social support and the incidence of depression in the older adults at Surabaya Dedali Hargo Nursing Home ($p = 0.037$). The Spearman rho - 0.468 correlation value indicates an inverse relationship with sufficient correlation coefficients. The higher the social support of the older adult, the lower the incidence of depression in the older adult. Older adult people who feel that they get good social support within the normal category (not depressed) totaled as many as 8 people (40%). There was 1 person (5%) older adult with social support experiencing moderate depression. Older adults with enough social support totaled 5 people (25%), older adults who did not experience depression totaled 1 person (5%), older adults who experienced mild depression totaled 2 people (10%) and the rest of the older adults had moderate depression. Older adults with less social support totaled 1 person (5%), older adults categorized as normal (not depressed) totaled 2 people (10%), older adult categorized as experiencing mild depression totaled 3 people (15%) and the rest were categorized as having moderate depression. The social support received by the older adults gives the individuals a feeling of comfort, of feeling loved when experiencing a decrease in self-esteem, bolstering assistance in the form of enthusiasm and demonstrating empathy, trust and attention so then the individual who receives it feels valuable.

**Conclusion**

Social support affects the incidence of depression in the older adult who live in the nursing home. The better the social support felt by the older adults, the lower the incidence of depression that is experienced. Therefore the support of families, residents and the administrators of the orphanage is needed by the older adults to maintain their mental health condition and to prevent the occurrence of depression.
Ethical Clearance: This research has been declared to be ethically feasible by the Health Research Ethics Commission (KEPK) of the Nursing Faculty of Airlangga University No: 205-KEPK.

Source of Funding: This study was independently funded by the researcher.

Conflict of Interest: The authors have declared that there is no conflict of interest.

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Knowledge and the “Magibung” Tradition Related to the Dietary Self-Management of Diabetes Mellitus

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1Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Magibung is the tradition of eating together with one’s family and relatives to celebrate traditional events. This tradition is contrary to the dietary recommendations for diabetes mellitus (DM) patients. The purpose of this study was to identify the correlation between knowledge and the magibung tradition on the self-management diet of diabetes mellitus patients. This study used a cross-sectional design. The samples obtained consisted of 138 respondents through purposive sampling. The data was collected using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire and the data was analyzed using the Spearman rho analysis test. The results showed that there was a correlation of knowledge (p=0.000) with diet self-management and that there was no correlation between the magibung tradition (0.184) with diet self-management. Age was the dominant factor that influenced the level of knowledge about diet for the DM patients. Being on a diet does not prevent the patient from participating in the magibung tradition. This is because it is about respecting family tradition and the community. Health workers are expected to optimize the health education provided to DM patients by paying attention to the local culture, especially to the elderly groups, in order to better understand DM self-management through discussion activities such as home visits, counseling and holding special gatherings.

Keywords: knowledge; magibung tradition; diet self-management; diabetes mellitus

Introduction

Diabetes mellitus (DM) requires patient independence in terms of managing their lifestyle. However, the results obtained are often not optimal and many sufferers have not shown independence in managing their diabetes.1 The diet is the basis for managing DM in the form of eating arrangements by providing all essential food elements according to the patient’s energy needs. This aims to maintain the BB and to prevent fluctuations in blood glucose levels through adherence to a schedule covering the type and amount of food required.2,3 Research conducted in several regions in Indonesia showed that the level of adherence of DM patients to regulating their eating according to the recommendations was still lacking.4-7

Indonesia ranks sixth in the world with ± 10.3 million people having been diagnosed with DM. It is ranked fourth in the world with ± 7.6 million people living with DM without knowing about the disease.8 The data of the Riset Kesehatan Dasar/Health Basic Research (RISKESDAS) in 2018 showed that the prevalence of DM patients in Indonesia had increased to 8.5% compared to 6.9% in 2013 for ages above 15 years old.9,10

Bali is famous for its blend of religious and cultural traditions, one of which is the magibung tradition originating from the Karangasem Regency. It is a traditional activity where a group of people sit in a circle to eat together out of one container.11,12 Magibung is full of compulsory rules as a form of discipline, such as not being able to overtake and following the food instructions. Exclusion from the community can result as a form of social sanction due to not following the magibung.11 Interviews with the DM patients found that
most of the menus served at magibung were variations of processed pork and “lawar foods”. Some of these types of foods have a high fat content such as processed pork, pork rolls and sequences (processed offal). These are not in accordance with the principles of the accuracy of the schedule and the recommended type and amount of food.13,14

The understanding of the DM patients who lacked an obligation to participate in the partying tradition was the most frequently problematic factor in DM patients as they did not go on a diet according to the accuracy of their schedule and the type and amount of food recommended. Thus, their self-management became worse, besides the effect of the economic, cultural and belief systems, social and religious factors.4,15,16 Some of the studies describe the eating habits at the family gatherings to be one of the situations that causes DM sufferers to have difficulty maintaining their dietary principles due to family stress or the context of trust that signifies solidarity and kinship from the traditional value of eating together.16–19 The purpose of the study was to identify the correlation between knowledge and the magibung tradition on the self-management of a diet suited for diabetes mellitus.

Method

Research design, population, sample and variables: The design of this study was correlational with a cross-sectional approach. The population consisted of 155 people with type 2 diabetes mellitus and the number of samples involved in this study was 138. Selecting the respondents was done through the purposive sampling method according to the chosen inclusion and exclusion criteria. The inclusion criteria specified were Type 2 DM patients with a minimum elementary school background, 1 year of having been diagnosed with the disease and being able to engage in traditional activities within the local village. The exclusion criteria were respondents who were confined to a state of bedrest. The independent variable in the study was the level of knowledge and the magibung tradition. The dependent variable was the self-management of their diet.

Instruments: The instruments used were three types of questionnaires in the form of a dietary knowledge test questionnaire based on The Starr County Diabetes Education Study developed by Laili NR with a Cronbach’s alpha value of 0.890.20 The magibung tradition questionnaire had a Cronbach’s alpha value of 0.775. The dietary self-management questionnaire was based on The Summary of Diabetes Self Care Activities (SDSCA-selected) translated and modified by Putri LR with a Cronbach’s alpha value of 0.855.21

Research procedures and analysis: The procedure for retrieving the data was by filling out questionnaires after the respondents had given their informed consent. The study was conducted for 2 weeks in 5 health centers, namely the Manggis I Health Center, the Sidemen Health Center, Bebandem Health Center, Karangasem I Health Center and Karangasem II Health Center. The collected data was analyzed using the Spearman rho analysis test with a confidence interval that was 95% with alpha (α) = 0.05.

Results

The majority of the respondents were 56 - 65 years old. The majority of the respondents were women. The respondents had the ability to speak Balinese as a colloquial language. Most of the respondents had primary level education as their educational background. The majority of the respondents worked as farmers. Based on the income aspect, the majority of the respondents had a total income of 2 million rupiah and most of the respondents had suffered from DM for between 1 - 3 years (Table 1).

<table>
<thead>
<tr>
<th>Table 1: Demographic Characteristics (n = 155)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td><strong>Age in years</strong></td>
</tr>
<tr>
<td>46-55 years</td>
</tr>
<tr>
<td>56-65 years</td>
</tr>
<tr>
<td>≥65 years</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Active Speak in Language</strong></td>
</tr>
<tr>
<td>Indonesia</td>
</tr>
<tr>
<td>Bali</td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
</tr>
<tr>
<td>Primary School</td>
</tr>
<tr>
<td>Secondary School</td>
</tr>
<tr>
<td>College or above</td>
</tr>
<tr>
<td><strong>Income</strong></td>
</tr>
<tr>
<td>≤2 million rupiah</td>
</tr>
<tr>
<td>≥2 million rupiah</td>
</tr>
</tbody>
</table>
Knowledge is based on one’s capacity to receive and use information about health to make decisions and actions in relation to managing their illness. The results of this study are also supported by the research into the factors associated with self-care practices among adults with diabetes, a rising global health problem, requires continuous self-care practice to prevent acute and chronic complications. However, studies show that few diabetes patients practice the recommended self-care in Ethiopia. The aim of this study was to assess factors associated with self-care practice among adult diabetes patients in public hospitals of West Shoa Zone, Oromia Regional State, Ethiopia.

Methods: In this cross-sectional study, 257 diabetes patients (mean age 42.9 ± 14.6 years, 54.1% male, in that the level of knowledge of patients about DM disease and its management has an important correlation with the practice of self-care. The better the level of knowledge possessed by the sufferer, the better they can improve their dietary self-management and vice versa. Based on the theory of Culture Care, knowledge is everything that humans know about objects, traits, intuition, revelation and thinking according to logic and experiments that are empirical (based on trial and error). Knowledge can be obtained through formal education and the surrounding environment (family and community). Individuals will receive knowledge in the form of experience and belief.

Culture Care theory also mentions that health behavior is formed by various factors working together. Research by Bakr and Breen et al explained that a low level of knowledge and a low level of income could negatively affect a patient’s nutritional and health status due to the lack of nutritional information related to food selection and a lack of access to nutritious food. In addition, Putra argued that the educational background of the patient being low can also lead to a poor understanding of DM which has an impact on poor self-care behavior.

Culture can influence the daily diabetes self-management in several ways, one of which is the environment in the form of familial and social factors. The results of this study contradict the research by Chesla et al, who argued that various types of obligations to attend cultural celebrations with banquets can inhibit the self-management of diabetic diets due to the tendency for opportunities that promote a lack of self-control over

<table>
<thead>
<tr>
<th>Working Experience</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer</td>
<td>72</td>
</tr>
<tr>
<td>Office employee</td>
<td>42</td>
</tr>
<tr>
<td>Sellerman</td>
<td>22</td>
</tr>
<tr>
<td>Government employees</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years Diagnosed with DiabetesMelitus</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 years</td>
<td>79</td>
<td>57.2</td>
</tr>
<tr>
<td>≥ 4 years</td>
<td>59</td>
<td>42.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Level of Knowledge and the Self-Management of the Diet (n = 155)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of knowledge</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>Sufficient</td>
</tr>
<tr>
<td>Poor</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Spearman Rho: p = 0.000 r = 0.342

<table>
<thead>
<tr>
<th>Table 3: The magibung Tradition and Self-Management of the Diet (n = 155)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magibung Tradition</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Positive</td>
</tr>
<tr>
<td>Negative</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Spearman Rho: p = 0.184 r = 0.114
food restrictions during meals. It was also stated that it was different from this study, in that Culture Care theory shows that the family and social environment was a strong aspect in the lives of the patients, one of which was through the role of food culture. The social roles and the symbols or meanings of food that are usually seen at banquets such as weddings, where relatives and friends share the same food, are a part of the tradition that signifies solidarity and builds social bonds.

People with DM in Karangasem still carry out the magibung tradition in the negative category or they have eating behavior that can harms the sufferers of DM. The patients rarely control themselves by consuming food without paying attention to the amount. In terms of the dietary self-management of patients in relation to the negative tradition of magibung, they also display a lack of self-management in their diet. Based on the content of the questionnaire, it was found that the respondents, in the diet self-management category, answered on average that they still often consumed high-fat foods in the form of beef, mutton, fried foods and sugar-containing snacks at a frequency of 5 - 6 days a week. This result is in accordance with the study by Bakr E-SH, which stated that DM patients, both men and women, have never eaten vegetables and that they like to consume red meat (dark meat). The respondents who practiced dietary self-management did not think that although they rarely go on a diet and even though they still regularly consume their prescribed drugs, their blood sugar will remain under control.

The surrounding community environment in the form of the familial and social factors through the tradition of magibung does not affect the self-management of DM patients. The researcher assumed that despite the obligation to follow the tradition, the DM patients in the Karangasem community were still able to control themselves while following the magibung tradition. This is evidenced by the majority of respondents who took part in the magibung tradition who were able to exercise control over themselves and who were not behaving in a way that was detrimental. They were still accompanied by good self-management in terms of their diet. In addition, the respondents also argued that following the tradition is a part of respecting their family traditions and how it manifests in their community life. It is not a problem for DM patients to follow the magibung tradition but DM sufferers also have to choose the type of food that can be eaten (according to their diabetes diet), keep up with their schedule and stay in control when the tradition is taking place. It can be concluded that the magibung tradition of the Karangasem community does not affect the implementation of dietary self-management carried out by the DM patients.

Conclusion

The level of knowledge has a relationship with the self-management of diabetic patient diets. There is the tendency for sufferers with a low level of knowledge to lack dietary self-management practices. The magibung tradition of the Karangasem community is not related to the implementation of self-management diets for DM patients. The DM diet does not prevent the patients from participating in the magibung tradition. Health workers are expected to optimize the health education that they provide by paying attention to the local culture of the DM patients with more emphasis on the community, especially within the elderly age group to better understand DM self-management. This can be done through discussion activities in the form of home visits, counseling or holding special gatherings for DM patients. The next researcher is expected to examine the factors related to the implementation of a self-managed diet further so then it can be known more deeply about what factors are at play in the cultural dimension that can have an impact on the implementation of a DM self-managed diet.

Ethical Clearance: This research received permission and passed the ethical review conducted by the Ethics Commission of the Faculty of Nursing on December 3rd, 2018 with certificate number 1199-KEPK in accordance with ethical principles.

Source of Funding: There was no funding source for this research, for the writing of this report or involved in the decision to submit articles for publication.

Conflict of Interest: The authors declared that they had no conflict of interest or financial interest in preparation of the article.

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Community Empowerment in the Madura Tribe with Exclusive Breastfeeding in the Working Area of Community Health Center Sreseh Sampang Madura

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ABSTRACT

The Madurese are a group of people who live on the island of Madura located in the province of East Java, Indonesia. They have a very strong culture, including when it comes to exclusive breastfeeding for newborns. The coverage of exclusive breastfeeding in this area is 40%. The aim of this study was to determine the relationship of community empowerment in the Madura tribe with exclusive breastfeeding using a cross-sectional design. The population consisted of mothers who had infants aged 6 - 8 months old. The samples totaled 132 respondents taken based on the inclusion criteria. The independent variable was community empowerment. The dependent variable was exclusive breastfeeding. The data was collected using a questionnaire and analyzed using the Spearman rank correlation with a level of significance of 0.05. The results were $p = 0.000$ ($p < 0.05$), which means that there is a relationship between community empowerment and exclusive breastfeeding, $r = 0.994$, which means that the relationship between community empowerment and exclusive breastfeeding is strong. The conclusion of this study is that the role of community empowerment, especially the involvement of religious figures and community leaders, is needed in an effort to improve the exclusive breastfeeding in the Madura tribe.

Keywords: exclusive breastfeeding, community empowerment, religious figure, community leader

Introduction

Exclusive breastfeeding is a feeding practice in infants during the first six months (0 - 6 months) which can improve the immune system of babies. The impact of infants who are not given exclusive breastfeeding is that they are particularly vulnerable to diseases such as inflammatory tract infections, respiratory infections, allergies, asthma attacks, decreased intelligence cognitive, increasing obesity, heart and blood vessel disorders, diabetes risk mellitus and the risk of chronic disease.

Exclusive breastfeeding in Indonesia is relatively low at only 80%, while in East Java, it reaches 73.8%. The coverage of exclusive breastfeeding in Sampang area is 40%. Various factors lead to lower exclusive breastfeeding, among others, when more and more mothers believe that breastfeeding alone is not sufficiently filling for their babies and that complementary feeding is an acceptable cultural thing to do when infant feeding. The recent research results in Indonesia showed that infants who get MP-ASI before they are 6 months old are more affected by diarrhea, constipation, colds and heat than babies who are only exclusively breastfeeding. In addition, accelerated feeding for infants can cause obesity.

The factors related to exclusive breastfeeding include the social support consisting of the support of the husbands, families, community leaders and health workers. Given the importance of exclusive breastfeeding for the optimal growth of both physical and mental health and intelligence, it needs attention from community empowerment which consists of: 1) the presence of community leaders and health cadres, 2) the existence of community organizations including community-based health efforts, (3) the availability of public funds, 4) the availability of facilities and materials.
from the community, 5) the level of public knowledge, 6) the technological willingness of the community and 7) for the decision making of the community to be carried out properly. However, the Madurese culture encourages the provision of complementary foods in addition to breast milk before the baby is 6 months old. This culture is still widely found in Sreseh Sampang District. This is certainly contrary to the concept of exclusive breastfeeding.

Community empowerment is needed for exclusive breastfeeding coverage with the help of community leaders and health cadres to encourage them to know and play an active role in mobilizing the target communities through communication, information and education. To realize the coverage of exclusive breastfeeding, one of its strategies is to improve community empowerment through exclusive breastfeeding support for pregnant women, in addition to postpartum and breastfeeding mothers.

The form of community empowerment in the Madurese community that is directly related to exclusive breastfeeding is social support consisting of support from the health workers. There is a relationship between community empowerment and exclusive breastfeeding for breastfeeding mothers. Some opinions from the results of the study explain this. In addition to these factors, there are several other factors associated with exclusive breastfeeding including socio-economic level, knowledge and culture. Based on the problems above, the authors was interested in analyzing and determining the relationship between community empowerment in the Madura tribe with exclusive breastfeeding.

Method

This research used a descriptive correlational research design with a cross-sectional approach. The sample size was 132 respondents in total. The sampling technique used in this research was purposive sampling. The independent variable in this research was the provision of community empowerment. The dependent variable in this study was exclusive breastfeeding. The instrument used in this study was a questionnaire. The first questionnaire was about the facilitators of women’s breastfeeding empowerment and ICRE (Individual Community Related Empowerment), consisting of 20 questions representing the facilitators of community empowerment and exclusive breastfeeding. The second questionnaire was about exclusive breastfeeding, which refers to the breastfeeding experience scale modified by the researchers. There were 6 questions using 2 choices for the answers. The answer “Yes” was given a score of 1 and the answer “No” scored 0.

This research was conducted in the working area of the Community Health Centre Sreseh, in the Sreseh District of Sampang Regency. This study started from March to June 2017. The data was measured using the Spearman Rank correlation statistic test if the significance value was \( \alpha \leq 0.05 \).

Results

The characteristics of the respondents showed that most of the respondents were aged 26 - 30 years old for as many as 56 respondents (42.2%) and most had 2 children (71.2%). The education level was still minimal with 79 people (59.8%). Most of the respondents did not work or they were a housewife, totaling 83 people (62.9%) (Table 1).

<table>
<thead>
<tr>
<th>No.</th>
<th>Demographic Characteristics of the Respondents</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mothers Age</td>
<td>20-25</td>
<td>52</td>
<td>39.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26-30</td>
<td>56</td>
<td>42.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31-35</td>
<td>24</td>
<td>18.2</td>
</tr>
<tr>
<td>2.</td>
<td>Mother’s education</td>
<td>Elementary School</td>
<td>79</td>
<td>59.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Junior High School</td>
<td>34</td>
<td>25.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior High School</td>
<td>19</td>
<td>14.4</td>
</tr>
<tr>
<td>3.</td>
<td>Work</td>
<td>House Wife</td>
<td>83</td>
<td>62.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farmer</td>
<td>29</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trader</td>
<td>20</td>
<td>15.2</td>
</tr>
<tr>
<td>4.</td>
<td>Income</td>
<td>Less than 1.350.000 IDR</td>
<td>132</td>
<td>100</td>
</tr>
<tr>
<td>5.</td>
<td>Family Type</td>
<td>Nuclear Family</td>
<td>49</td>
<td>37.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extended Family</td>
<td>83</td>
<td>62.95</td>
</tr>
<tr>
<td>6.</td>
<td>Number of Children</td>
<td>2</td>
<td>94</td>
<td>71.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-4</td>
<td>38</td>
<td>28.8</td>
</tr>
<tr>
<td>7.</td>
<td>Child’s age</td>
<td>6 Month</td>
<td>52</td>
<td>39.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 Month</td>
<td>38</td>
<td>28.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 Month</td>
<td>42</td>
<td>31.8</td>
</tr>
</tbody>
</table>
Domain 1 contains the health system factors; there were 78 (59.1%) good respondents. Domain 2 contains the individual and family factors; there were 108 (81.8%) respondents. Domain 3 contains about the social and cultural factors with 101 (76.5%) respondents. Domain 4 contains the religiosity factors, totaling 106 (80.3%) respondents (Table 2).

<table>
<thead>
<tr>
<th>Domain</th>
<th>Good</th>
<th>Enough</th>
<th>Less</th>
</tr>
</thead>
<tbody>
<tr>
<td>The health system factors</td>
<td>78</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Individual and family factors</td>
<td>8</td>
<td>108</td>
<td>16</td>
</tr>
<tr>
<td>Social and cultural factors</td>
<td>4</td>
<td>101</td>
<td>6</td>
</tr>
<tr>
<td>Religiosity factors</td>
<td>21</td>
<td>106</td>
<td>5</td>
</tr>
</tbody>
</table>

There were 10 respondents (7.5%) with a sufficient level of community empowerment who did not exclusively breastfeed. There were 49 (37%) who had a sufficient level of empowerment who exclusively breastfed. Breastfeeding was not exclusive to community empowerment for as many as 14 respondents (10.6%); 59 respondents (44.6%) had good empowerment and exclusive breastfeeding. The Spearman rank statistical test results obtained (p=0.000) with a significance level α (0.05). There was a relationship between community empowerment with exclusive breastfeeding in the working area of Sresheh Sampang Madura Community Health Centre. The value of the correlation coefficient (r) = 0.960 means that the level of the relationship is strong enough with the direction showing there to be a positive correlation between community empowerment and exclusive breastfeeding. This shows that if an empowered society is getting better, then exclusive breastfeeding is also getting better (Table 3).

<table>
<thead>
<tr>
<th>Community Empowerment</th>
<th>Exclusive breastfeeding</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non exclusive</td>
<td>Exclusive</td>
<td>f</td>
<td>%</td>
<td>r</td>
</tr>
<tr>
<td>Good</td>
<td>14</td>
<td>59</td>
<td>44.6</td>
<td>0.993</td>
<td>0.000</td>
</tr>
<tr>
<td>Enough</td>
<td>10</td>
<td>49</td>
<td>37</td>
<td>73</td>
<td>55.3</td>
</tr>
</tbody>
</table>

Discussion

The distribution of educational demographic domain data shows half of the respondents have less education level. The higher the client’s education, the better the client’s conviction as it is usually supported by rational scientific evidence. Such individuals can learn to adapt to the appropriate culture according to their health condition. Formal maternal education affects the mother’s knowledge level; where the level of education is low, then the knowledge gained will be less and vice versa. Knowledge is an important domain for the formation of one’s actions. Mothers with a low level of education tend to be stronger in terms of maintaining food-related traditions and cultures, thus making it difficult to receive new information in terms of the proper feeding of infants.

The results showed that half of the respondents had a good level of education but that they still provided early breastfeeding. Different maternal education levels do not determine the breastfeeding behavior of infants aged 6 - 8 months. Knowledge is a domain that is important for attitude formation. Good knowledge was already possessed by the respondents which formed the basis for determining their attitude. The respondents with a good level of knowledge tend to be good in terms of exclusive breastfeeding.

Mothers aged 19 - 25 years old generally have a more adequate milk production than older mothers. This occurs because of breast enlargement with every ovulation cycle from the beginning of menstruation to age 30 years. However, degenerate breast and milk producing glands (alveoli) as a whole occurs after the age of 30 years. A person’s behavior both positive and negative will be influenced by age including in predisposing factors, where the more mature one’s age is, the more positive the behavior. Age is one component that comes from within that can affect behavior. Promotes immune system formation and supports organ development. Breastfeeding could
also protect from obesity, diabetes and cardiovascular disease. Furthermore, human colostrum (HC When viewed through the number of children, this indicates that a mother with the number of children 2 while the mother with the number of children 3-4 (multiparas) did not give exclusive breastfeeding to the baby at the age of 0-6 month.

The absence of any experience with a psychological object tends to form a negative attitude toward the object.⁴ According to the Analysis of the Implementation of Exclusive Breastfeeding Program, mothers with a multi-parity status are 3 times more likely to do exclusive breastfeeding compared with first time mothers.⁵ There is no significant relationship between the number of children with exclusive breastfeeding practices.⁶ This was assumed because mothers who have children <3 in the study area had more free time to come to the health care facility with the opportunity to obtain information related to exclusive breastfeeding practices.

The number of children does not affect the level of exclusive breastfeeding. The Madurese habit of breastfeeding depends on the culture and traditions of the people around them. Viewed from the economic factors, we can show that all of the respondents have a lower economic status with an under average income. Someone who has the material resources will use them to pay to treat his illness to get better sooner.⁸ In the case of supplementary feeding, income is important because the better the family economy, the better the purchasing power related to supplementary food becomes easier. Otherwise, the worse the family economy, the more difficult the purchasing power when it comes to additional food.⁹ in others they are given as complementary foods during weaning. Improper food selection at this stage is associated with a high prevalence of malnutrition in children under 5 years. Here we listed the traditional foods from four continents and compared them with human milk based on their dietary contents. Vitamins such as thiamine (~[2-10] folds Families of a high economic status will tend to choose to give formula milk, instant porridge or biscuits that are of good quality and with a better nutritional content, whereas families with a lower economic status will tend to choose to provide rice or bananas as an additional food to babies because they are economically cheaper and follow the local culture.⁹

Community empowerment can be done by health workers, cadres and religious leaders in relation to educating on exclusive breastfeeding. This means showing that the level of the relationship is strong enough with a positive correlation between empowering the community with exclusive breastfeeding. This means the better the community empowerment, the higher the level of exclusive breast feeding. For the coverage of exclusive breastfeeding, one of the strategies is improve community empowerment by providing exclusive breastfeeding support to pregnant women, in addition to postpartum and breastfeeding mothers.¹⁰,¹¹

The improvement of the coverage of exclusive breastfeeding requires knowledge of exclusive breastfeeding that can be provided by the health workers and local cadres through information. This is in order to identify the facilitating factor that can contribute to the development of effective policies and interventions.¹² This is in accordance with the theory of community empowerment in which the presence of community leaders and health cadres, the existence of community organizations, the availability of facilities and materials and an awareness of the level of knowledge of the community and of technology is very much needed in the process of exclusive breastfeeding.²² The domain of community empowerment that contains the social and cultural factors shows that most of the respondents have a negative value concerning culture. The negative culture of the respondents includes the habit of giving bananas, porridge and water to infants before the age of 6 months for the baby to sleep faster and stop crying.⁵

**Conclusion**

Good community empowerment will enable the mothers to exclusively breastfeed. It is usually a factor of culture that affects breastfeeding. The participation of health workers and cadres through community empowerment, especially the involvement of religious figures and community leaders, is needed in an effort to improve the exclusive breastfeeding within the Madura tribe in order to reduce the behavior provision of early breastfeeding and the increased coverage of exclusive breastfeeding.

**Ethical Clearance:** The ethical approval for this study was granted by the IRB committee of the Faculty of Nursing of Airlangga University in 2017.

**Source of Funding:** There was no funding source for this research and for the writing of this report. There was no source of funding involved in the decision to submit the article for publication.
Conflict of Interest: The authors declare that they have no conflicts of interest or financial interests in the preparation of this article.

REFERENCES


Health-Related Quality of Life for Patients with Cardiovascular Disease after a Coronary Artery Bypass Graft: A Systematic Review

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ABSTRACT
CABG can affect health-related quality of life (HRQoL) and it can take a long time to improve. The following question was raised: ‘How long does it take for the HRQoL of patients with a Coronary Artery Bypass Graft (CBAG) to increase?’ The aim was to analyze the recent scientific production of HRQoL in cardiovascular patients with CABG. The PRISMA approach was used and we examined articles from Scopus, EBSCO and ProQuest that were published between 2014 - 2018. We used “health related quality of life”, restricted our search to “coronary artery bypass graft” and used “after” in the title, keywords and abstract connected by the Boolean operator “AND”. SF-36 was used to assess the HRQoL and it increased within six months after CABG. This was influenced by self-control, obesity, age, gender, emotions and personality. Improving the patient’s quality of life is key for the nurses to control so then the heart surgery patients become prosperous and thus reduce their morbidity and mortality.

Keywords: health related quality of life; coronary artery bypass graft; cardiovascular disease

Introduction
The number of individuals suffering from cardiovascular disease in the world continues to increase every year. Cardiovascular disease is the foremost most disease in Indonesia, ischemic heart disease specifically.¹ The most common medical treatment for heart disease is Coronary Artery Bypass Grafting (CABG) for coronary heart disease. Medical management can affect the quality of life of patients with cardiovascular disease.² The act of limiting activities, restricting eating and making changes in their lifestyle in post-CABG patients is an effort that is required to maintain the quality of life in patients after medical management. Only a few patients experience depression and this interferes with HRQoL.³ Attention must be directed to the more important aspects, namely quality of life, because individuals not only want a long life but they also want to improve their quality of life.⁴ Improving the quality of life is also one indicator of the success of CABG operations. This includes symptom prevention and management behaviour post-CABG recovery. The patients also believe and have hope about controlling their illness and treatment in the new approach and they seek to clarify the various symptoms and adaptations that are useful in terms of quality of life.⁵ The importance of measuring the impact of medical interventions on quality of life related to patient health (HRQoL) is emphasized. HRQoL is also seen as how the results of the treatment can successfully provide potential changes to the lives of the patients.⁶ Some studies also suggest important results in terms of increasing HRQoL, such as several factors being involved namely comorbid diseases, depression, anxiety and the incidence rate of cardiovascular invasive procedures.⁷ But up until now, although some studies say that there is a decrease in quality of life after CABG, it is but not yet known in detail the factors that contribute to quality of life in patients who have had CABG. The purpose of the study was to analyze recent scientific production about HRQoL in cardiovascular patients with CABG.
**Method**

**Research design and search strategy:** The systematic review research design resulted from and focused on the latest research over the last 5 years. This study used the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA) approach. The process of searching the articles was electronic. The data was obtained from Scopus, ProQuest, and EBSCO. The literature review used the keywords ‘Health related Quality of Life’, ‘After’ and ‘Coronary Artery Bypass Graft’. In the article search, we used the Boolean operator “AND”. After a number of articles was obtained, the researcher then selected them again according to the specified inclusion and exclusion criteria. The article searching process was carried out from August to October 2018. The search for articles used keywords that had been determined by the researchers and they also provided limits as per the inclusion and exclusion criteria. The data obtained from Scopus, EBSCO and ProQuest were then selected one by one by the researchers to determine their suitability. After obtaining articles that were in accordance with the researchers’ intentions, the articles were analyzed one by one and grouped to get the results. The next step was to discuss what had been found based on the points obtained from the results.

**Inclusion and Exclusion Criteria:** The desired articles were articles published between 2014 – 2018 and articles written in English focusing on the keywords in the search for relevant articles. Articles with samples that did not focus on patients with PCI and CABG, the discussion of articles looking at outside life quality (HRQoL) as well as articles based on a systematic review, narrative review, thesis, books or chapters, abstracts and editorials were not used in this study.

**Results**

The initial literature search returned 123 abstracts (71 from SCOPUS, 39 from EBSCHOHOST and 20 from PROQUEST). After reviewing the abstracts for relevance and matching them with the inclusion criteria, 45 articles were selected for a full-text review (34 from SCOPUS, 15 from EBSCHOHOST and 6 from PROQUEST). There were 24 duplicate articles and 2 articles published in 2013 which were excluded. Finally, 19 articles were chosen to be reviewed. The studies were heterogeneous. There were 13 cohort prospective/observational studies, 4 randomized trial studies, 1 longitudinal study and 1 descriptive qualitative study [Figure 1].

The general instruments used were 13 studies analyzed with The Short-Form Health Survey (SF-36 and SF-12). The Short-Form Health Survey (SF-36) questionnaire has been proven to be the most widely used tool to evaluate quality of life among patients undergoing cardiac treatment and surgery.3

Most of the studies stated the majority of respondents’ HRQoL scores increased after undergoing CABG surgery, both in the physical and mental domains. Two years after CABG, the clients became more confident in themselves and their health, with 81% of patients having a good quality of life.5 Post-CABG HRQoL is influenced by a variety of factors, including the type of CABG (on-pump or off-pump), self-control related to health, obesity, age, gender, type-D personality and the role of emotional physical roles, vitality and social functions.

**Figure 1:** Flowchart of articles selected in the systematic review; the selection process using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes). The articles were obtained from SCOPUS, EBSCO and ProQuest totaling 123 articles. The final studies included in the synthesis was 19 articles.

**Discussion**

There are several stages related to behaving healthily. The stages include precontemplation (in 6 months, not yet interested in making changes), contemplation (considering changes in the next 6 months), preparation (trying to make changes but not and wanting to do it again the following month), action (actively developing
strategies to make changes, sometimes after almost 6 months with time and effort to commitment) and maintenance (changes continue, starting 6 months after the action phase begins). The health-related quality of life increased in patients 6 months after CABG was performed. However, 12 months after CABG was done and even for years after, there was an increase in the quality of life as well. The most common occurred after 6 months. This may occur because patients who have long been hospitalized may have begun to experience boredom or they may be in the action stage. In addition, depression before surgery causes a high level of hospitalization. Prolonged surgical pain can last for up to 6 months and they may have difficulty returning to their previous activities. One needs to consider the effect post-CABG cardiac rehabilitation on older elderly people, as this has an adverse impact on CABG. Psychological morbidity includes depression, anxiety, personality and emotional roles reinforcing a decrease in the quality of life of the patients. This improvement does not seem to be realized in all patients who had undergone CABG surgery.

Objective: The aim of this study was to test the direct and indirect influence of personality trait Type D on no change-deterioration trajectories HRQoL and the mediating influence of increased symptoms of anxiety and depression. Methods: The hypothesized influence of personality trait Type D on the relationship between increased anxiety and depression and no change-deterioration trajectories in HRQoL was tested with path analysis using structural equation modeling. Results: The results of the current study show that Type D personality comprised a vulnerability factor for poor patient-reported outcomes (i.e., HRQoL and distress) over the years, CABG measures have reduced the significant mortality rates but strangely, there are still patients who have a psychological condition even 5 years post-CABG. The lack of resolution for the psychological problems of patients after rejection can cause recurrent heart attacks. For that, the nurse should facilitate by helping and relaxing the patients by providing sedatives.

The female gender is reported as slowing the increase in HRQoL due to low coping mechanisms and changing role perspectives. Women often suffer from chest pain in the arterial area in an epicardial coronary. There was a gender difference in the biological process that transmits and modulates pain signals; the nervous system of men and women is different when it comes to detecting and responding to pain (pain sensitivity) and the emotional cognatic response to pain differs between men and women. The female gender therefore correlates with a quality of life related to low health. Pain is also associated with the quality of life of patients who have carried out CABG. It is known that the standard blood vessels used for CABG are the safnia magna vein and the left internal mammary artery of the chest. Although the prevalence of severe pain decreases yearly by year and modern analgesic methods are used, chronic pain after CABG remains a concern because the incidence rate of chronic pain has reached 30-50%. Chronic pain after CABG also relates to the subsequent cost estimates for the health care and social support systems. This post-operative CABG pain may also be associated with the somatic, visceral and neuropathic conditions. The lack of resolution for the psychological problems of patients after rejection can cause recurrent heart attacks. For that, the nurse should facilitate by helping and relaxing the patients by providing sedatives. The perception of post-CABG training has an impact on HRQoL. Bad perceptions becomes a barrier within cardiac rehabilitation training. It is known that poor diet and poor exercise are the independent risk factors in developing worsening CAD post-CABG surgery. Exercise, lifestyle modification and diet after CABG surgery is important to pay attention to in order to avoid future risks to one’s health. The differences in age do not really show as having a specific impact on HRQOL. The patients who are <60 year old age undergoing CABG have worse outcomes than those of an older age. Age is related to cognitive processes. Cognitive differences are usually higher in older people compared to middle-aged adults. Clinical performance included pulmonary function, which is a physical component related to a decrease in lung function that is also related to an increase in CRP and post-operative blood cortisol concentrations and a greater preoperative IVC.
they know the effects of the disease (treatment, follow-up, limitations). Functional capacity and quality of life in patients dependents on any comorbidities, and this can greatly increase the health care costs of the comorbidity itself. This makes the patients feel that their health function has deteriorated, thereby reducing their quality of life.

**Conclusion**

Health-related quality of life after CABG has proven to be significantly improved. The peak time shows that the patient feels that their quality of life is good after 6 months of action. This needs to be observed again later on. The link of having many supporters involved in the improvement of their quality of life is key for the nurses to control. This is so then the heart patients reduce their risk of morbidity and mortality.

**Ethical Clearance:** Ethic clearance was not carried out or required due to the article being based on a systematic review.

**Source of Funding:** There was no funding source in the research, in the writing of this report or in the decision to submit the article for publication.

**Conflict of Interest:** The authors declare that they have no conflict of interest or financial interest in the preparation of this article.

**REFERENCES**


Factors Contributing to Leprosy Stigma among Madurese People

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ABSTRACT

Leprosy is a disease that still has a stigma in society. Leprosy patients are considered have a curse from God, so they must be shunned, are incurable and are disinherited. This study aimed to identify the factors contributing to the leprosy stigma among the Madurese people in Indonesia. This was a descriptive analytical study with a cross-sectional approach that involved 107 adult people living around leprosy patients obtained through simple random sampling with other certain criteria. The variables measured were education, economic status, regulations and policies, cultural values and lifestyle, the family and social factor, the religious and philosophical factor, technology and leprosy stigma. The data was collected using a questionnaire and analyzed using the Spearman Rho test (α=0.05). The study revealed that education, economic level, regulations and policies, cultural values and lifestyle, the family and social factor, the religious and philosophical factor and also technology had a significant correlation with leprosy stigma (p=0.011; p=0.02; p=0.008; p=0.011; p=0.015; p=0.000; p=0.0037). It is expected for the government and health workers to conduct socialization and counseling focused on leprosy, therefore allowing people to be able to understand the disease, thus lowering the leprosy stigma.

Keywords: leprosy stigma, madurese people, education, economic factor, cultural values.

Introduction

Leprosy is a disease that still has a stigma within the community. The stigma arises because of the false perception of leprosy. Many people still think that leprosy is caused by a curse or witchcraft, that it is a punishment from God, sin, eating certain types of food or inherited. Wrong beliefs in the community have continued to expand until now, thus affecting the self-confidence and social function of leprosy patients. This study aimed to determine the factors associated with the emergence of stigma in the Madurese people based on their beliefs and culture.

The World Health Organization (WHO) reported in 2015 that there were 210,758 new lepers and that Indonesia ranks the third largest focus of leprosy cases in the world after India and Brazil. Throughout 2013, the Indonesian Ministry of Health recorded 16,825 new leprosy cases with a disability rate of 6.82 per 1,000,000 people. In addition, the East Java Health Office reported that in 2015, there were 3,835 cases consisting of 3,506 adult patients and 329 cases where the patients were children. The distribution of leprosy cases in East Java based on leprosy type was 498 PausiBasiler (PB) and 3,337 Multi Basiler (MB). Based on the Bangkalan Regency Health Profile in 2015, the number of new leprosy cases was 310. This number has increased from the previous year. One of the biggest leprosy case contributors is the Burneh Health Center work area. Based on the data from the Burneh Health Center, the number of new case findings in 2014 was 12 lepers, increasing in 2015 to as many as 22 lepers and more in 2016, up to 38 lepers.

Bangkalan Regency is an area that still has many leprosy sufferers. This is influenced by the condition of Bangkalan regency, which is mostly made up of slum areas. The spread of leprosy in the Bangkalan area not only affects the ongoing health conditions but it also affects the social and economic conditions. The results
of the preliminary study focused on 8 randomly selected respondents on April 2017 showed that there is still a negative perception (stigma) felt by the leprosy patients from the community. Some unpleasant events related to the stigma can occur, such as 1) when a man with leprosy attended the congregational prayer, other people stayed away from him; 2) a woman with leprosy is not married -although she wanted to- because she is ostracized by the community and confined herself to her home until she was finally able to escape to Kalimantan Island; 3) a teenager with leprosy refuses to go to school because he is bullied and thought of as strange by his friends and 4) two patients dropped out of a treatment regime because they were embarrassed and felt the stigma even from the health workers. Therefore, it is necessary to identify why the stigma is still high in the community, so then in the future, an appropriate intervention can be formulated to overcome this problem.

Method

Study Design, Setting, and Sampling: This study was descriptive using a cross-sectional approach. The population in this study consisted of the community living around people with leprosy in the same area (1-2 km in distance) in Bangkalan Regency, as many as 146 people; 107 respondents were selected through simple random sampling.

Study Variables: The variables measured included education, economic status, regulations and policies, cultural values and lifestyle, the family and social factor, religion and philosophy, technology and the leprosy stigma.

The education and economic factors were measured using a questionnaire. The questionnaire focused on regulations and policies, cultural values and lifestyle, social life and family, religion and philosophy and technology was modified from transcultural theory. The stigma questionnaire is a modification of the questionnaire on community stigma used in studies focused on HIV/AIDS sufferers.

Data Analysis: A descriptive statistics method was employed to analyze the data in order to generate the study results in the form of frequencies, percentages, mean, ranges and standard deviation. This method allowed us to summarize the characteristics of the study subjects based on the variables selected. The data was analyzed using the Spearman Rho correlation test with a significance level of ≤ 0.05.

Results

To begin with, 107 respondents were residents obtained from the community around known lepers. Table 1 presents the characteristics of the respondents included in this study. All of the respondents were adults with an age range of 26 - 35 years old for the majority (55.1%). Most of them (64.4%) were female. In addition, most of respondents were farmers (42%) and unemployed (25.2%).

Table 1: Characteristics of the respondents (n = 107)

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>f (x)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-25 y.o</td>
<td>18</td>
<td>16,8</td>
</tr>
<tr>
<td>26-35 y.o</td>
<td>59</td>
<td>55,1</td>
</tr>
<tr>
<td>&gt;35 y.o</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>69</td>
<td>64,4</td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>35,5</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>27</td>
<td>25,2</td>
</tr>
<tr>
<td>Government employee</td>
<td>5</td>
<td>4,6</td>
</tr>
<tr>
<td>Farmer</td>
<td>45</td>
<td>42,0</td>
</tr>
<tr>
<td>Private employee</td>
<td>8</td>
<td>7,4</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>16</td>
<td>14,9</td>
</tr>
<tr>
<td>Temporary employee</td>
<td>6</td>
<td>5,6</td>
</tr>
</tbody>
</table>

Table 2 displays the distribution of each of the variables measured in this study and the statistical results. It was found most of the respondents had graduated from elementary school and that 21 respondents had a negative stigma. In addition, the statistical test results showed $p = 0.011$ ($p <0.05$), so there was found to be a significant relationship between the level of education and the leprosy stigma in the community. In line with the previous results, other factors (economic, regulatory and policy, cultural and life value, social and family, religious and philosophy and technology) also showed a significant relationship with the emergence of leprosy stigma in the community with a value of $p <0.05$ respectively (see table 2). In fact, all of the variables also showed a weak to strong correlation.
Table 2: Cross tabulation and statistical results (*n* = 107)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Stigma</th>
<th>Statistical result</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>p</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>None</td>
<td>15</td>
<td>6</td>
<td>0.011</td>
</tr>
<tr>
<td>Elementary</td>
<td>17</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Junior high school</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>9</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Higher education</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>53</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td><strong>Economic</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>&lt;Bangkalan minimum wages</td>
<td>20</td>
<td>38</td>
<td>0.023</td>
</tr>
<tr>
<td>≥ Bangkalan minimum wages</td>
<td>22</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>42</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td><strong>Regulation and policy (perceived support)</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Positive</td>
<td>32</td>
<td>22</td>
<td>0.008</td>
</tr>
<tr>
<td>Negative</td>
<td>7</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>39</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural and life value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>25</td>
<td>13</td>
<td>0.011</td>
</tr>
<tr>
<td>Negative</td>
<td>29</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>54</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td><strong>Social and family (perceived support)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>31</td>
<td>18</td>
<td>0.015</td>
</tr>
<tr>
<td>Negative</td>
<td>21</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>52</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td><strong>Religiosity and philosophical value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>26</td>
<td>9</td>
<td>0.000</td>
</tr>
<tr>
<td>Negative</td>
<td>28</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>54</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td><strong>Technology (perceived support)</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Positive</td>
<td>26</td>
<td>14</td>
<td>0.037</td>
</tr>
<tr>
<td>Negative</td>
<td>27</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>53</td>
<td>54</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

Based on the data that has been conveyed above, the following will be discussed about the relationship of each of the factors studied according to the purpose of the study, which is to explain the factor analysis related to the emergence of leprosy stigma in the community based on the theory of transcultural transmission at Burneh health center in Bangkalan Regency.

The respondent’s distribution data based on the economic factors showed that the majority of the respondents had an less economic status with an income below the Bangkalan minimum wage, which was < Rp. 1,530,655.00 for as many as 38 (35.5%) respondents. The economic relationship with leprosy stigma showed there to be a correlation coefficient of 0.220, thus indicating there to be a weaker correlation strength. The lower the economic income of the community, the higher the stigma that the community has. Economic factors are one of the important things related to someone providing good support. Friedman and Leininger stated that the higher the level of economic status, the more support and decision-making can be provided in the treatment of lepers. A person will utilize the material resources that are owned by them to finance his illness so then he can get well soon. The factors that influence a person’s economic status include education, employment, income, economic conditions and cultural background. 7,8

In relation to the regulatory and policy factors, the results of the statistical test showed the factors as having a significant correlation with the leprosy stigma in the community. The regulatory and policy factors yielded that almost half of the respondents had negative rules and policies, namely that 46 (42.9%) of the respondents had a negative stigma. The relationship between regulations and policies with the leprosy stigma showed a correlation coefficient of 0.257, which indicates a weak correlation strength. The more negative values that the regulations and policies that people have, the lower the stigma of the community. According to the theory of transcultural nursing by Leininger (2002), it explains that the hospital policies and regulations that are applied and that everything that affects individual activities in cross-cultural nursing care. 8 In this study, there were no government regulations and policies relating to leprosy.

Based on the results of the research that has been conducted on the cultural and life values factor, the majority of the respondents have a negative value for cultural values and lifestyle in relation to the emergence of the leprosy stigma in the community for as many as 40 (37.3%) respondents. The negative cultural values and lifestyle of the respondents stated that, from the beginning, they thought that leprosy had to be shunned, that it was a hereditary disease and that it could spread throughout the community. They assumed that leprosy is a frightening disease. According to transcultural theory, culture is the norm of the actions of the group members.
who are being studied, who can then be divided and provided instructions for thinking, acting and making decisions. In this study, there was a relationship between cultural values and the emergence of leprosy stigma in society. The results of this study are in line with the theory of transcultural nursing, where culture and lifestyle factors are very influential concerning a person’s actions. The respondents who have the stigma of leprosy are influenced by their habits, as well as the beliefs that have become the rules of life of a region, where most of the cultural and lifestyle factors have a tendency towards displaying negative behavior towards leprosy. According to the researchers, cultural values and lifestyles are closely related to the emergence of leprosy stigma in society. If the culture adopted by the individuals or related groups in daily life is not good, then this will affect the behavior of the individuals or groups in viewing and treating lepers. This can be seen from societal habits or culture, where many people still think that leprosy is a disgusting disease; a disease that must be shunned, even to the point where leprosy is considered to be a hereditary disease. The higher the cultural values and lifestyle that the community has, the lower the stigma.

The respondent distribution data based on the social and family factors showed that most of the respondents had negative values regarding the social and family factor in terms of the occurrence of the leprosy stigma for as many as 37 (34.5%) respondents. The social and family factors that are inherent in the community to date, so if they are suffering from leprosy then it is kept a secret because of a fear of their neighbors or people who they know. People who suffer from leprosy are exiled or confined to a room and there are still many people who stay away from lepers because they are afraid of contracting the disease. Pierce defined social support as a source of emotional, informational or mentoring support provided by people around individuals both in the neighborhood and in the community to deal with every problem and the crises that occur in everyday life. Based on the results of the study, the results indicate that there is a relationship between the social and family factors towards the emergence of the leprosy stigma in the community. Familial social support is still bound by the habits, customs, and beliefs of the family or community, thus causing a negative perception of leprosy. The higher the social and family factor owned by the community, the lower the stigma that they have.

The results of the data on the religious and philosophical research that has been conducted by the researchers indicated that most of the respondents have a negative value regarding their religious and philosophical factors, as many as 43 (40.1%) respondents. People still think that leprosy is caused by a curse from God, from eating wrong and also by rarely worshiping. According to the transcultural theory of nursing, religiosity provides a very strong motivation to place the truth above all else, even above a person’s own life. This causes a person to have a humble nature and open sense of self. Religiosity and philosophy includes the existence of a religion that is embraced, as a way of looking at the disease and as a method of treatment involving religious habits that have a positive effect on health. It is known that there are three dimensions involved in the religiosity of the Madurese. The experience dimension is about feeling calm when doing religious actions. The dimensions of religious knowledge is focused on beliefs that are described by tradition. The frequency dimension is about what the impact will be after doing a religious action, between the bad and good effects.

The research results showed that there is a relationship between religion and philosophy with the emergence of the leprosy stigma in society. The respondents thought that leprosy could be caused by a curse from God because of the sins of the individual, because of a curse or because he rarely worshiped. Some thought that leprosy could only be cured by a shaman or a traditional medicaster, or by religious leader referred to as a “kyai”. The higher the strength of the religious philosophy that the community has, the lower the stigma it has.

The respondent’s distribution data based on technological factors showed that most of the respondents had less technology, with as many as 40 (37.3%) respondents answering negatively. This was due to the lack of knowledge of the respondents in terms of utilizing or obtaining health and/or electronic technology. Therefore how the respondents get their information about leprosy is lacking. Even today, there has never been any form of offered counseling about leprosy either from the government or from the puskesmas.

According to the theory of transcultural nursing, technological factors are one of the factors that influence individual behavior based on culture. Health technology is an infrastructure that allows individuals to choose or get offers to solve problems within the health services.
The utilization of health technology is influenced by the attitudes of the health workers, paired with the needs and interests of the community. Technology refers to all forms of technology used to create, store, change and use information in all its forms.\textsuperscript{8,12}

**Conclusion**

The variables that significantly correlate with the emergence of leprosy stigma in the community in the Burneh health center in Bangkalan Regency are educational factors, economic factors, regulatory and policy factors, cultural values and lifestyle factors, social and family factors, religious and philosophical factors and also technological factors. It is expected that the Burneh Community Health Center in Bangkalan Regency will conduct socialization and counseling on the causes and transmission of leprosy in each hamlet or village. This is so then people can better understand what leprosy is and how it is transmitted.

**Ethical Clearance:** This study was granted ethical approval by the Ethical Committee of Health Research in the Faculty of Nursing, Universitas Airlangga No. 483-KEPK in August 2017.

**Source of Funding:** None.

**Conflict of Interest:** None

**REFERENCES**


How Diabetic Men Perceive Sex and Sexual Dysfunction

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ABSTRACT

Sex is an adult human need, including for diabetic men. Irregular changes in the blood sugar level causes complex sexual disorders with a high incidence rate, but this has never been explored in-depth regarding the fundamental view of sex and their disorders. This study explored the subject of focus by conducting a qualitative research study using a phenomenology approach that aimed to explore diabetic men and how they perceived sex and sexual dysfunction at a General Hospital in Jakarta. In-depth interviews were conducted with 7 participants. The findings provide detailed information on two main themes; sexual perceptions and how the men perceive the associated dysfunction. It was concluded that sex is a primer and a secondary need. Dysfunction becomes a disturbance of the primer need and this affects the patient psychologically.

Keywords: diabetic men, sex, sexual dysfunction

Introduction

Diabetes is a huge and growing global problem; close to 350 million people in the world have a diabetes. In 2013, the number of diabetes cases in the world numbered 382 million and this is set to increase by more than 55% (592 million) in 2035. In 2012, diabetes was the direct cause of 1.5 million deaths, with more than 80% of them occurring in low-and middle-income countries. The WHO projects that diabetes will be the leading cause of death by 2030.

People with diabetes have an increased risk of developing a number of serious health problems, including people in Indonesia. The International Diabetes Federation (2014) said that Indonesia is the fifth largest diabetes population in the world. This number is as a consequence of a large problem.

Uncontrolled blood sugar results in several complications within the vascular and neural system, including relating to sexual health. Diabetes is the main biological organic cause of sexual dysfunction.

Sex is a part of human life. As an important human need, sex has never been explored clearly. People have no idea how to explore it or where to find the help needed to solve their sexual problems. This results in a sexual pattern problem between the patient and their partners.

Sexual dysfunction may occur for more than 50% of men; this can include sexual desire disorder, erectile dysfunction (ED), early ejaculation and orgasm disorder. Sexual dysfunction is higher in diabetic men with complications than sexual desire disorder (19% vs. 4%), ED (31% vs. 6%), orgasm problems (31% vs. 2%) and all other dysfunctions (40.5% vs. 6%). The two main sexual problems for diabetic men are erectile dysfunction (35.8%-82%) and early ejaculation (30%-70%).

The sexual changes cause complex problems that are both physical and psychological. Diabetic men feel insecure, guilty, warrant a decrease in intimacy, have low self-esteem and they feel like it is a doomsday and a change in their welfare patterns. In a partnered relationship, they feel like a failure in the marriage, and they are embarrassed to discuss or solve it. All of the psychological responses are influenced by their health beliefs, namely that sexual functioning has an important meaning within the overall health condition, including what they perceive about sexual health.

In Indonesia, sexual problems are never or rarely discussed. This is because of several factors concerning...
the patients, their family and the health staff. Sexual complexity, sexual identity and sexual dysfunction are some of the knowledge areas in nursing practices. Considering sexual well-being and its effect on a diabetic man’s life, it is important to have a holistic approach to the care of diabetic men. This study has explored, in depth, the fundamental views of how patients perceive sex and sexual dysfunction.

Method

Using the phenomenology approach, this research was conducted in a general hospital of Jakarta following the granting of ethical clearance. A total of 7 participants was selected to reach the saturation point of the data. The criteria of the participants were that they were diabetic men with sexual dysfunction between 30 and 60 years old, who were married, who had a good standard of good communication, who were cooperative, who had never been a participant before and who had given their informed consent.

The first screening was decided using the International Index of Erectile Function (IIEF). Using the in-depth interview method, field notes, recordings and memory note, the interview was conducted 1 - 3 times in a private room. The data was digitally recorded and transcribed verbatim by the researcher, re-read, transcribed, identified, defined and the themes and sub-themes were named. The researcher used credibility, dependability, conformability and transferability to ensure that the methods were valid.

Results

The narrative was used to interpret the themes and sub-themes. This research found there to be 2 major themes; 1) the perception of sex in a man’s life and 2) the perception of sexual dysfunction in a man’s life.

Table 1: Thematic map showing the themes, sub-themes and categories on the perception of sex and sexual dysfunction in a man’s life

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-Themes</th>
<th>Categorical</th>
</tr>
</thead>
<tbody>
<tr>
<td>The perception of sex in a man’s life</td>
<td>Primary need (major)</td>
<td>Important</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requirement</td>
</tr>
<tr>
<td></td>
<td>Secondary need (un-necessary/not important)</td>
<td>Not dependent on sex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sex isn’t everything</td>
</tr>
<tr>
<td></td>
<td></td>
<td>It is not necessary</td>
</tr>
<tr>
<td>The perception of sexual dysfunction in a man’s life</td>
<td>Interfere with their primary needs</td>
<td>Dangerous for life</td>
</tr>
<tr>
<td></td>
<td>Does not interfere with their life</td>
<td>Disturbing their life</td>
</tr>
<tr>
<td></td>
<td>Psychological impact</td>
<td>An ordinary thing</td>
</tr>
<tr>
<td></td>
<td>Age as a cause of sexual dysfunction</td>
<td>Influenced by age</td>
</tr>
</tbody>
</table>

The perceive of sexual: The diabetic men were asked “What do you perceive of sex for men?”

Primary needs (major): The diabetic men had a view that sex is a primary need or a major thing in a man’s life.

Important: They mentioned that sex is very important aspect of their life. For example:

“Wooowwww, that is an important thing, it makes me exited… it is a major thing” (P1-)

Primary needs: The diabetic men explained clearly that sex is an important need for them. They can differentiate this sexual view with the view of a woman. According to his wife’s opinion, he said:

“According to me, as a man, sex is yeaaaah it is a life need, primarily, that… as a primary need. Sex is a second primary needs, according to me yeah, to me. Well, the first primary needs are eating, drinking, and sex is the second. This is a very primary and major need. For women, I think that it is not too necessary” (P 2-)
Requirement: The diabetic men appreciated that sex is a requirement in their lives. They were convinced:

“Yeah that is a requirement…” (P 7-)

Secondary needs (un-necessary/not important): For some of the participants, it is a secondary need only. For the same question, “What do you perceive of sex for men?”, some of the participants gave the following opinions:

Not dependent on sex: One of the participants said that in marriage, they are not dependent on it being sexual, as there are other things that are more important. For example:

“Yaaach, marriage is not dependent on it… isn’t it?” (P 3-)

Sex is not everything: The same participant continued with the explanation that sex is not everything in life. He said:

“… sex is not everything” (P 3-)

Un-Necessary: In case, another participant said briefly that sex is not an important thing anymore because his wife is sick and they have a child already. They said that:

“… my wife is sick now. My physician sad that he have a myo (mean myoma), massive bleeding, and now she is on obstetric ward, sex is not necessary anymore Nurse” (P 4-)

“… that not important anymore, we had an offspring” (P 6-)

The perception of sexual dysfunction: The participants were asked “How do you perceive sexual disturbance or the sexual dysfunction that is hurting you now?” and “What is your opinion about this disturbance in your life?”

Interfering with one’s primary needs (major): Sex is a primary need for men. When dysfunction occurs, the participant felt interfered with. This phrase was expressed in some of the following categories:

Dangerous for life: One diabetic man assumed that sexual dysfunction is very dangerous. He said:

“Wow wowwow… it sooooo dangerous, very dangerous… “(P 1-)

Disturbing in life: Two of the 7 participants said that sexual dysfunction was disturbing in their lives. Both said:

“Soooooo this problem, diabetes… these sexual problems are very disturbing, exactly…” (P 3-)

“I felt disturbed previously, ya” (P 6-)

Does not interfere life: One of the 7 participants thought that sexual dysfunction is normal and an ordinary thing. This was proven by:

“It is normal, I still have passion and I am excited” (P 7-)

Psychological impact: Sexual dysfunction is considered to be a cause of psychological changes. Those are a decrease in the spirit (demoralizing), a decrease in self-esteem and it being a very important problem.

Demoralizing (decreasing their spirit): One of them said that sexual dysfunction is a decreasing of the spirit.

“… when it disappears, there is no spirit in me to take make it work” (P 2-)

Decreasing their self-esteem: One of the participants explained that sexual dysfunction will change his self-esteem. They feel useless and feel shame with their partner.

“I feel ashamed regarding my wife” (P 2-)

Being very important: Regarding the participants, sexual dysfunction is an influential problem in life. The second participant said that:

“… it is a problem for me, a big problem…” (P 2-)

Age as a cause of sexual dysfunction: In the interview, a few of the participants said that sexual dysfunction occurs as a part of getting older. The answers for the question “Is there any influence from age?” are as follows:

“So, this is a dysfunction…yeah all of this depends on age…” (P 1-)

 “… decreases along with age…” “(P 3-)

“I think it is because of age, I am nearly 50” (P 4-)

Discussion

The aim of this article was to identify the perceptions of diabetic men on sex and sexual dysfunction.

Sex in life is a process, and the perception of sexual dysfunction is about sexuality, sexual functioning and
healthy sex. The participants considered that sex is an important part of life, as a primary need after eating and drinking and as a requirement for staying in shape regarding sexual function.

The participants assume that sex is restricted to coitus. Rowland and Incrocci (2008) said that a man is sexual and that they focus on different women. A man focuses on the genital area, as a means for having coitus (having sex).15

The healthy sexual views become a point of man. Mccarthy & Metz (2008) said that sexual health is based on both the physical and psychological dimensions in men. The sexually healthy man is a man who has self-esteem, who is proud of their sexuality, and who believes in themselves and their power. They have a wide imaging sexual, which is good for the body it will be good for sexual life, and vice versa.11

Generally, sexual health in a man is sexual satisfaction, including making love, and having a good level of sexual knowledge and health. These are seen of as a power and as part of an ongoing developing process. The result of sex is intimacy and satisfaction.11

Men are proud of their sexual virility and masculinity. The principle of sexual health is being proud of one’s sexual functioning, having self-esteem focused on sexual desire and having good sexual functioning.11 According to them, a normal sex life is about having a normal penis, normal sexual functioning (an erection and ejaculation), normal sexual fantasies (aggressive and attractive sex) and how to make love well.

In fact, when the dysfunction occurred, the men felt disturbed, with a low sense of self-esteem and with a low spirit. They perceive sexual dysfunction as a primary need disturbance and this has a psychological effect. Dysfunction makes their life dangerous and this can change their wife’s response by 180 degrees. Finally, it hurts their integrity and self-esteem as a man and as a husband.

As a primary need, a healthy sexual life is a condition that increases one’s spirit and sense of life. However, when dysfunction occurs, it is like doomsday. According to the participants, they feel worthless, they have no spirit, they feel hopeless and they feel unhappiness after work because they have no functioning when it comes to giving satisfaction.

In other fact, there was one participant who was not bothered because they only experienced middle or light dysfunction. They only experienced early ejaculation and thus they can have a healthy sexual relationship.

Another participant perceived that sexual dysfunction is caused by age and getting older. It is a normal condition of the degenerative process. In theory, the peak age is around 30 years old. After that, the degenerative stage will occur. Physiological changes in the elderly regarding their sexual activity is gradual and shows vascular, hormonal and neurological aspects. There is still the assumption that chronic disease will weaken the sexual condition directly, impacting on the reproduction system and allows for the spurring on of psychogenic sexual dysfunction.

In fact, some of the participants explained that sex is not everything. Marriage is not just dependent on sex and being sexual is not a primary need. Three participants noted clearly they have sexual problems because of erectile dysfunction, early ejaculation and because they cannot give their partner satisfaction. However, marriage is not about sex and having sex. There are a lot of ways to give a love and attention (P3). Two other participants (P6 and P5) said that a good and high commitment within marriage is more important. They have made a promise to God, to give one another love, attention and by understanding each other as is necessary in life (P3, P6, P5).

Conclusion

Sex in a man’s life is perceived as both a primary and secondary need. Sexual dysfunction is perceived as an interference of a primary need, as having a psychological impact, decreasing the spirit and causing low self-esteem. Age is a cause of sexual dysfunction.

Ethical Clearance: The ethical approval for this study was granted by the IRB of the Nursing Faculty of Indonesia University, permit letter 1556/H2.F12.D/PDP.04.02/2011

Source of Funding: There was no funding support for this research. The author used self-funding to conduct the research.

Conflict of Interest: None
REFERENCES


Short Education Movies and Demonstration Methods Related to Elementary Student Wound Care Behavior

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ABSTRACT

School-age children are susceptible to injuries that can cause cuts and potentially infection, but children’s knowledge of wound care is still lacking. The study aims were to analyze the influence of Short Education Movies (SEMs) and demonstration methods on the wound care of elementary students. The study was quasi-experimental with a control group pre- post-test design. A total of 40 out of 181 elementary students in Peneket and Sidorejo were taken as respondents through simple random sampling. The independent variable was Short Education Movies (SEMs) and demonstration methods. The dependent variables were knowledge, attitude and practical wound care. The data was collected using questionnaires and observations. The data was analyzed using the Wilcoxon signed rank test and the Mann Whitney U Test. The results showed that health education using the SEM and demonstration method can increase the knowledge (p=0.000), attitude (p=0.001) and practices (p=0.000) of the intervention group. The Mann Whitney test in the intervention group and the control group obtained the following results: knowledge (p=0.002), attitude (p=0.000) and practice (p=0.000). The application of SEM and the demonstration method is effective when applied to elementary students because it is easily understood.

Keywords: Short Education Movie, demonstration, injury, wound care

Introduction

A wound is a disruption of normal tissue continuity that is both structural and functional. Wounds can cause infection if not handled properly, so they need the best management from the start. School-age children don’t have good knowledge of wound care. The role of school-age children in providing first aid for their wounds greatly determines the continuation of wound healing.

The incidence rate of school-age child injury in northern Sweden is 2.4 per 100 children, with an annual incidence rate of 2.9 per 100 students in Norway. The incidence rate of injuries in Indonesia was 7.5% in 2007 and this has since increased to 8.2%. The Central Java province’s data about the prevalence of injuries and their causes shows that they are due to accidents by 40.1%, falling by 42.1%, being exposed to sharp objects by 6.7% and burning by 0.6%. The victims of minor injuries in 2015 ranged about 500 and in 2016, this ranged about 450. The prevalence of the usual causes of injury in school is falling to about 40.9%. According to Pertolongan Pertama untuk Anak Cara-Cara Praktis Menangani Kecelakaan dan Mengatasi Keadaan Darurat, injuries can cause infection in children of a low socioeconomic status. The incidence of infection can be prevented by the proper handling and intervention of the injuries. Health education about wound care can be done so then the children can treat any injuries that are experienced independently.

Health education is a form of intervention designed to help individuals and communities to improve their health by increasing their knowledge or by influencing their attitudes and practices. Learning through different demonstration methods can increase the student’s learning motivation. The learning method conducted using short films can increase creative thinking, strengthen visual understanding, provide an active role for the students and be effective in the wider context.
According to Piaget, children are at the stage of concrete operational development. They need a real learning situation where the method is used in demonstrations after getting the material using a short movie. However, research on learning using short films or Short Education Movies combined with demonstrations about the care of minor wounds has never existed until now.

The purpose of this study was to determine the effect of Short Education Movies and the demonstration method on the wound care behavior in school-age children.

Method

Study Design, Sampling and Variables: The study was a quasi-experimental pre-test post-test with a control group design. The research was conducted at an elementary school in Peneket and Sidorejo, Center Java. There were 40 out of 181 elementary students in Peneket and Sidorejo taken as the respondents through simple random sampling. The total sample used amounted to 40 respondents, consisting of 20 respondents in the intervention group and 20 respondents in the control group. There were 2 respondents from the control group who dropped out because they did not attend the post-test. The sample criteria consisted of the inclusion criteria, exclusion criteria and drop outs. The inclusion criteria in this study were children who were in the concrete operational stage at the age of 9-11 years. The exclusion criteria were students who did not attend the scheduled meeting, while the drop out criteria consisted of the respondents who did not complete the research activity and who thus resigned as respondents. The independent variable was the Short Education Movie (SEM) and demonstration method. The dependent variables were knowledge, attitude and practice wound care.

Instruments: The knowledge and attitude questionnaire guide was a modification of the Yuliana questionnaire. Observation sheets were used for the practice. The tools used were a Short Education Movie in the form of a video; it also included the tools and materials needed for wound care demonstration and the appropriate leaflets. The Short Education Movie provided contained the steps to treating minor injuries such as abrasions, burns, bruises and the 6 steps of hand washing.

Data Collection: In this study, the researcher used simple random sampling, which is where the researcher chooses the sample by giving an equal opportunity to all members of the population to be determined as a member of the sample. The selection of the respondents was done randomly using a lottery. The choice of the individuals to become members of the sample was really based on chance, in the sense of them all having the same opportunity. The selected students were then given an explanation of the research and they were given an informed consent sheet to ask for approval from their parents.

The study was conducted pre-test and post-test. In all of the groups, the pre-test was carried out by filling out a questionnaire on their knowledge and attitude before then practicing first aid on bruises, abrasions and burns. The intervention group was given health education by looking at the video and then the demonstration was accompanied by the facilitator. The interventions in the intervention group were carried out 2 times. The control group was given a placebo leaflet without any information about wound care or hand washing. Then the post-test was done in both groups in the same way as the pre-test. The study was conducted in December 2018.

Data Analysis: The data was analyzed using the Wilcoxon signed rank test and the Mann Whitney test with the level of significance $\alpha \leq 0.05$.

Results

Table 1: Statistical Results for Knowledge

<table>
<thead>
<tr>
<th>Knowledge level category</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>Good</td>
<td>$\Sigma$</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Enough</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Less</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Wilcoxon Signed Ranks Test $p = 0.000$ $p = 0.237$

Mann-Whitney U Test $p = 0.002$
Table 1 showed that there were differences in the knowledge between the intervention and control groups. The results of the Wilcoxon signed rank test in the intervention group showed p-value = 0.000, which means there was a difference in knowledge before and after the intervention. The results of the statistical tests done using the Wilcoxon signed rank test in the control group showed p-value = 0.237, which means there was no difference in the knowledge before and after giving the placebo leaflet. The Mann Whitney U Test result statistically showed that there was a significant difference between the post-test result in the intervention group and the control group.

Table 2: Statistical Results for Attitude

<table>
<thead>
<tr>
<th>Attitude level category</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Σ</td>
<td>%</td>
</tr>
<tr>
<td>Positive</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Negative</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Wilcoxon Signed Ranks Test</td>
<td>p = 0.001</td>
<td>p = 0.021</td>
</tr>
<tr>
<td>Mann-Whitney U Test</td>
<td>p = 0.000</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 showed that there were differences in attitude between the intervention and control groups. The results of the Wilcoxon signed rank test in the intervention group showed p-value = 0.001, which means that there was a difference between the attitude before and after the intervention. The results of the Wilcoxon signed rank test in the control group showed p-value = 0.021, which means there was a difference between the attitude before and after the intervention. The Mann Whitney U Test result statistically showed that there was a significant difference between attitude post-test in the intervention group compared to the control group.

Table 3: Statistical Results for Practice

<table>
<thead>
<tr>
<th>Practice level category</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Σ</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Enough</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Wilcoxon Signed Ranks Test</td>
<td>p = 0.000</td>
<td>p = 0.180</td>
</tr>
<tr>
<td>Mann-Whitney U Test</td>
<td>p = 0.000</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 showed that there were differences in practice between the intervention and control groups. The results of the Wilcoxon Signed Rank Test in the intervention group showed p-value = 0.000, which means that there was a difference between practice before and after the intervention. The results of the Wilcoxon Signed Rank Test in the control group showed p-value = 0.18, which means that there is no difference between the practice before and after the intervention. The Mann Whitney U Test result statistically showed that there was a significant difference between the practice in the post-test result in the intervention group compared to the control group.

Discussions

The influence of SEM and the Demonstration Method on Knowledge of Wound Care: The level of knowledge of the intervention group respondents in the pre-test was mostly in the sufficient category, and there were still those in the lower category. The results of the post-test focused on knowledge showed that more than half were in the good category and that none were in the lesser category. According to Metode Brainces terhadap Peningkatan Pengetahuan,Sikap, dan Praktik Perawatan Anak Usia Sekolah, the level of knowledge
of the students after being given health education was better than before being they had been given health education. Starting from giving the stimulus through vision, hearing, the child knows about the information and it is then processed in the brain so then they are able to recall the material. Based on this study, the majority of the respondents experienced an increase in knowledge but 2 of the respondents were found to have a steady level of knowledge. This is because of the ability to process information and because each child remembers the material differently. The two respondents who remained at the same level of knowledge were caused by them not focusing when the health education activities were given.

The control group in the pre-test for knowledge obtained the most data, which was in the sufficient category. After the post-test, it was still the same, namely in the sufficient category. There were 2 respondents from the control group who were declared as having dropped out because they did not attend the post-test. The control group had no increase in knowledge even though they had been given a leaflet. According to the study by Elvina, health education and leaflet administration could increase the knowledge of preventing asthma suffering in asthmatics. The results of this study were not in accordance with the previous studies. There was no difference in knowledge between the pre-test and post-test in the control group because the researcher gave the leaflet to the respondents without there being any information on injuries and wound care. The control group was not given any health education, and they were only given leaflets without any information about injuries. The content of the leaflet was only a question about whether there has ever been counseling provided about injuries, how to program the School Health Unit, and questions about the doctor.

The influence of SEM and the Demonstration Method on the Attitude to Wound Care: The results showed that not all of the respondents in the intervention group had a positive attitude in the pre-test. The intervention showed the results of an increase in the attitude of the respondents in the intervention group. The results of this study support the theory of Lawrence Green (1991) in which he states that health education can influence the predisposing factors involved, namely attitude, where the predisposing factor can lead to changes in a person’s behavior. Education is a system that has an influence on the formation of attitude because it can lay the foundation of understanding and moral concepts in individuals. The results of the control group showed that more than half of the respondents had a positive attitude in the pretest stage. The results of the post-test attitude in the control group showed that the respondents still had a negative attitude. The results in the control group were almost the same as those of the intervention group. The research by Maulana, stated that attitude is not innate and that it can be formed through experience. Health education using Short Education Movies can be given twice to provide effectiveness to the students in remembering the material provided. This study is in accordance with the previous studies regarding the effect of health education on attitude. However, when the intervention and control groups were compared, there was no difference. This is because attitudes are difficult to change in a short time. Changing an attitude takes a long time and repetitive intervention.

The factors that can affect the outcome of the data is the factor of the facilitator in stating that the communication was not adequate enough to deliver the information to the respondents. This is a weakness in this study.

The influence of SEM and the Demonstration Method on the Practice of Wound Care: The practical for the intervention group respondents, when the pretest time was obtained, showed that all of the intervention groups had fewer practice categories. The results of the intervention group’s post-test were mostly in the good category, as there was a good increase in the scores. The results of this study supported the theory of Lawrence Green (1991) which states that health education can influence predisposing factors, namely the practice where such predisposing factors can lead to changes in a person’s behavior. This study is consistent with research Sauerberger and Kawuriansari, who conveyed about health education that has a positive relationship with knowledge and practice (actions), where if knowledge and practice can be maintained it will lead to consistent behavior.

The control group showed there to be no difference in the pre-test and post-test values because the leaflets provided did not contain information about injuries. There were differences in the behavior of the intervention and control groups. According to Media Leaflet dalam Pembelajaran, they stated that the weaknesses of the leaflet media is that the media cannot stimulate sound effects and motion effects, and that they are easily
Leaflets are less attractive than movies. The researcher only provided leaflets without any information about injuries, so the leaflets contained only the effects of the placebo.

Conclusion

SEM and the demonstration method influences the increase in knowledge, attitude and practices of minor wound care in school-age children. The respondents, after being given the intervention, will get better care information so as to increase their knowledge. Although difficult attitudes can be changed in a short time, the results of the data showed that the intervention can improve the attitude of the respondents for the better. Practice can bring the respondents ‘real’ situations so then the respondents can see, hear and increase their skill at treating minor first aid injuries. Further researchers are advised to compare the effectiveness of the demonstration method combined with Short Education Movie media with more methods and media in order to obtain better health education methods for school-age children.

Ethical Clearance: The ethical review of this study was granted by the Health Research Ethics Commission (KEPK) of Universitas Airlangga, certificate number: 1236-KEPK.

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Conflict of Interest: None

REFERENCES

Comparison of Blood Glucose Levels in Type 2 Diabetic Patients Who Consume Rice Steamed and Through the Magicom Method

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3Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Differences in cooking techniques can affect the glycemic level of rice. The aim of this study was to identify the differences in the blood glucose levels of people with DM after consuming rice cooked using either the steamed method or magicom. This study used a pre-experimental design with one group pre-post test with a repeated measure, which was then compared with the difference in fasting glucose levels with a 2-hour post-prandial glucose level. The sample consisted of 24 type 2 DM patients. The independent variable was the cooking method and the dependent variable was the blood glucose level. The data collection was conducted using an observation and a questionnaire. The data analysis was done using a paired t test with a significance level of 0.05. The results of the independent sample t-test analysis obtained a value of \( t = -1.583 \) and \( p = 0.128 \), so there was found to be no significant difference between the fasting blood glucose levels and 2 hours post-prandial. The results of the descriptive comparison analysis showed that there were differences in the glucose levels between consuming rice cooked using either the steamed or magicom method of 18.304 gr / dl with \( p = 0.128 \). Rice cooked with the steamed method is more likely not to increase the blood glucose levels than rice cooked with mMagicom. DM patients should consume rice that has not been heated for a long time.

Keywords: Blood Glucose Level, Steam Method, mMagicom, Diabetes Mellitus Tipe 2

Introduction

The cultural change related to cooking rice is going from steamed rice to using a rice cooker. There has also been a shift in the culture of eating between those who previously consumed cold rice from wakul to those who are now consuming hot rice from rice cookers. This causes a problem because hot rice has a higher glycemic index (GI) than cold rice. The consumption of food with a high GI can continuously increase th insulin resistance to glucose, causing diabetes mellitus. So far there have been no studies explaining the differences between the effects of the different rice cooking methods on the increasing blood glucose levels.

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The International Diabetes Federation (IDF) estimates that 415 million adults worldwide are suffering from type 2 Diabetes Mellitus (DM). This figure is expected to continue to increase to 640 million in 2040. In Indonesia, the proportion of DM is 6.9 percent among the non-communicable diseases. The prevalence of DM is 1.5 percent, whereas East Java has a higher prevalence than the national average of 2.1 percent.

Technological advances in food cooking not only provide convenience but they also cause various other impacts on human health. One technology that is currently widely used by the public is the method of cooking rice with a rice cooker. The shift in culture to cooking rice from steamed rice is a rice cooker, and there has also been a shift in the culture of eating from those who previously consumed cold rice from a wakul to those eating hot (warm) rice from rice cookers. This causes a problem because hot rice has a higher glycemic index (GI) than cold rice. The continuous consumption of high glycemic index foods can increase the insulin resistance to glucose and cause DM. So far there have been no
studies explaining the differences in the effect of rice cooking methods on an increase in blood glucose levels.

One of the important goals of medical nutrition therapy in people with DM is to achieve and maintain blood glucose levels in the normal or near normal range. Effective nutrition interventions are very important to achieve better glycemic control and thus reduce the risk of diabetes complications while improving quality of life.\textsuperscript{8,9} Carbohydrate diets are the most important determinant of postprandial glucose levels and they are the main nutritional component of foods consumed by diabetics. Therefore, knowing the pattern of glucose response after consuming carbohydrate foods can help to identify the best foods that can be consumed daily.\textsuperscript{8-10}

The glycemic index of a food is influenced by several factors, one of which is the method of food processing, such as heating (steaming, boiling, frying) and milling (shoveling) to reduce the particle size. The processing method can change the physicochemical properties of food. Heating starch with excessive water results in starch undergoing gelatinization and structural changes. Reheating and cooling the starch that has undergone gelatinization also changes the structure of the starch further, which leads to the formation of new insoluble crystals in the form of terrogrograsi starch, which causes changes in the IG values.\textsuperscript{11-14} The purpose of this study was to identify differences in the blood glucose levels of people with DM after consuming rice cooked with the steamed and magicom methods.

Method\textsuperscript{15,16}

This study used a pre-experiment design with the pre-post-test group repeated measure. The population consisted of 95 people with type 2 diabetes mellitus and the samples involved in this study totaled 24 people. The selection of the respondents was done using the purposive sampling method according to the inclusion and exclusion criteria. The inclusion criteria specified were Type 2 DM patients with a minimum elementary school background, who had had the disease for 6 months and who were actively engaged in diabetes mellitus club activities. The independent variable in the study was rice cooking with both the steamed and rice magicom methods. The dependent variables were fasting blood glucose levels and 2 prandial post-hours.

The observation of the blood glucose levels was done with an On Call device. The characteristic data of the respondents was collected through a questionnaire developed from the patient’s medical report data. The respondents, prior to this, had provided informed consent. Before the measurement was done, the patient was asked to fast for 6 - 8 hours beforehand, and then the measurement as done before and 2 hours after eating rice post-prandial (PP)

The collected data was analyzed using descriptive and inferential statistics and a paired t test at a significance level of 0.05.

Result

This study showed the respondent’s characteristics in terms of gender, the number of complications related to the disease, how long they had been suffering with DM, their education level, working experience, hospitalization history and if they were regularly taking their medicine.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>45.8</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>54.2</td>
</tr>
<tr>
<td>Number of Complications regarding the Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>66.7</td>
</tr>
<tr>
<td>How long they had been Suffering with DM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6 month</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td>6 month 5 years</td>
<td>16</td>
<td>66.7</td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td>Secondary school</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>College or above</td>
<td>10</td>
<td>41.7</td>
</tr>
<tr>
<td>Working Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td>Private</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>Retired</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td>Government employers</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>Farmer</td>
<td>1</td>
<td>4.2</td>
</tr>
</tbody>
</table>
Most of the respondents were of the female sex (13; 54.2%) and the rest of the percentage were male are (11; 45.8%). Most of the respondents had experienced a number of complications from the disease >1 (16; 66.7%) and a small number had experienced no complication (6; 25%). Most of the respondents had been suffering with DM from 6 months up to 5 years (16; 66.7%) and a small number had been suffering with DM for over 5 years (3; 12.5%).

Most of the respondents were educated to college level or above (10; 41.7%) and most had a primary school level of education (8; 33.3%). All of the respondents were married. Most of the respondents had been retired (8; 33.3%) and a small number worked as farmers (1; 4.2%). Most of the respondents had never been hospitalized (16; 66.7%) and a small proportion had often been hospitalized (1; 4.2%). Most of the respondents consumed or used their prescribed drugs regularly (20; 83.3%) and a small portion consumed their drugs irregularly (4; 16.7%).

<table>
<thead>
<tr>
<th>Rice Cooking Method</th>
<th>Mean</th>
<th>SD</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Kukusan</td>
<td>51.6087</td>
<td>32.04505</td>
<td>t = -1.583</td>
</tr>
<tr>
<td>Magicom</td>
<td>69.9130</td>
<td>61.06696</td>
<td>p = 0.128</td>
</tr>
</tbody>
</table>

Based on the results of the t-test for the Equality of Means analysis, it was found that there were only differences in the glucose levels between the respondents who consumed rice cooked with the steamed and magicom methods respectively. There were differences in the glucose levels of 18,3014 gr/dl with p = 0.128, meaning that for the blood glucose levels for these 2 groups, it was stated as not being significantly different.

Discussion

There were no differences in the fasting blood glucose levels and 2 hours pp in the type 2 DM patients in the Diabetes Mellitus Club of Dr. Soegiri Hospital Lamongan. They consumed good rice wraps, used the method of cooking steamed rice and they also used a rice cooker. However, from the t-test results for the Equality of Means analysis, the steamed method and the magicom method were not significantly different. This result can be influenced by the broad cross-sectional area being wider than the cross section area. The heating is faster and more evenly distributed, so the time needed is shorter than the rice cooker method.

The prevention of DM can be done in three ways, primary, secondary and tertiary. Primary prevention is aimed at preventing diabetes. Primary prevention can be done by having a balanced diet, regular exercise, maintaining a normal weight, getting enough sleep, avoiding stress and avoiding drugs that cause diabetes. Secondary prevention aims at making sure that the existing DM does not cause complications related to other diseases and that it eliminates any symptoms and complaints of disease. Prevention Secondary diabetes is carried out with a balanced and healthy diet, maintaining a normal body weight, monitoring blood sugar, and exercising regularly. Prevention of tertiary diabetes aims to prevent the occurrence of defects such as blindness, kidney failure, and stroke.\cite{14,17,19}

Based on the opinion of Rimbawa and Siagian (2004), long heating can increase the size of starch granules. Where the expanding granule has been increased, the free starch molecule is very easily digested. This is because the digestive enzymes of starch in the small intestine have a wider surface to connect with to the enzyme, eventually resulting in a rapid increase in blood sugar levels.\cite{20,21}
In terms of the rice cooking method, the steamed method, when compared with the magicom method, showed there be no difference when analyzed using the Equality of Means t test even though descriptively there were differences in the glucose levels of 21.791 gr/dl. The pairwise comparison test stated that it was not significantly different. This is because one of the times used to cook the rice between the steamed and magicom methods was only 2 minutes different. Besides that, all of the liquid was entirely absorbed in the rice seeds when compared with the steamed method where there was liquid starch which is shed from the water in the cage. It is possible that this result distinguishes the rice glycemic index between the various methods.

In accordance with the research of Daradakumbura, Wejesinghe and Prassantha (2013) upon examining the rice cooked using the rice cooker, steamed and cider methods, it was found that there was no significant difference in the glycemic index level, although descriptively in the rice cooker method, the difference in the glucose levels was higher. This is possibly because it is based on the fact that the process of putting it in takes about 2 minutes. Another result was that the rice cooked with a rice cooker is consumed immediately, so if the rice is left to heat in a few hours, this will increase the glycemic index of the rice.

In type 2 DM, the patients obtained 37.5% glucose levels that were still above normal, where their fasting glucose levels were still > 140 mg/dl. This also relates to a decrease in pancreatic organ function because 33.3% are retired, so their pancreatic function experiences a decrease due to the aging process. With these conditions, DM education needs to be carried out to support behavior change and to improve the understanding of the disease.

The DM education material covers the course of DM, the need for DM control, the complications of DM and the risks, pharmacological and non-pharmacological therapy, the interaction of food, activities and drugs, ways of independent blood glucose monitoring, the importance of physical exercise, foot care and how to deal with hypoglycemia. The limitations of this study were the low participation rate of DM patients and social support in health promotion activities and the difficulty of controlling confounding variables including stress factors.

**Conclusion**

Rice cooked using the steamed method is more likely not to increase the blood glucose levels than rice cooked with magicom. It is recommended for diabetic patients to lessen their consumption of rice that has been heated for a long time, by releasing the electricity flow of magicom. Steamed rice is better than the rice cooker method at maintaining blood glucose stability. The research implications are that patients need to know the method of cooking rice that is good for DM patients. There needs to be a new method of health education and family support to control blood glucose levels.

**Ethical Clearance:** This research received permission and passed the ethical review conducted by the Ethics Commission of the Faculty of Nursing on July 23rd, 2018 with certificate number 1039-KEPK in accordance with ethical principles.

**Source of Funding:** The funding support for this research was Universitas Airlangga

**Conflict of Interest:** None

**REFERENCES**


Factors Affecting the Nurse’s Caring Behaviors in Surabaya Jemursari Islamic Hospital

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ABSTRACT

Caring is a central nursing practice. However, many nurses are still found to have less care for their patients’ condition. Some of them are still inhospitable, harsh and less sensitive to the patient’s condition. This study aimed to analyze the factors affecting the nurse’s caring behavior in hospital. The design of this study was descriptive and observational, done using the cross-sectional approach. This study involved the population of all nurses working in the medical and surgical rooms of Surabaya Jemursari Islamic Hospital, totaling 44 nurses. The sample of 40 respondents was chosen using the simple random sampling technique. The independent variable was the nurse’s individual characteristics: age, sex, level of education and emotional intelligence. The dependent variable was the nurse’s caring behavior. A questionnaire was used to collect the data which was analyzed using the Chi-square Test. The nurse’s individual characteristics, namely age, sex, and level of education, did not affect the nurse’s caring behaviors (ρ ≥ α: 0.05), whereas emotional intelligence affected the nurse’s caring behaviors (ρ = 0.00 ≤ α). The factor affecting the nurse’s caring behavior was emotional intelligence. Therefore, hospitals need to provide nurses with training for better self-management and caring behavior.

Keywords: caring, emotional intelligence, empathy, self-management, self-control

Introduction

Caring is the trend in this era because the current wave of healthcare marketing has shifted from excellent service based on standard operating procedures or minimum service standard to care with character, which sets the values of caring as the principles of healthcare.¹,² Caring is a basic concept of nursing.³ High quality nursing care supported with good caring can affect the quality of healthcare because the caring performed by nurses may influence patient satisfaction.¹,⁴ In fact, many nurses are still found to have a lack of caring for the patient’s condition while showing their inhospitality, anger, unfriendliness, unresponsiveness to the client’s complaints and poor communication with their clients. Among the 10 people obtained through the interviews in the preliminary data stage, it showed that 7 people complained about the nurse’s behavior. They stated that some of the nurses showed inhospitality, that they ignored the complaints from the patient’s family and that they gave less of an explanation and information when performing nursing care. This condition may affect the healing process and patient satisfaction.⁵

The research conducted by Koll et al claimed that the nurse’s skills and care about the patient’s privacy were the satisfying factors for the patients.⁵ The research conducted by Abdulrouf et al stated that there was an effect of perceived disconfirmation consisting of reliability, assurance, tangibility, empathy and responsiveness on patient satisfaction in RSI Sultan Agung Semarang.⁶ The patients need nurses who listen to their complaints willingly, who share their feelings and who give suggestions with care. In addition, they need nurses who make frequent visits voluntarily, who

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ask about the patient’s condition and feelings, and who give clear and complete information about all actions done to the patients.

Caring behaviors are actions that are concerned with the well-being of a patient, such as sensitivity, comforting, attentive listening, honesty and nonjudgmental acceptance. Caring behaviors are affected by several factors, such as the nurse’s and patient’s perception, age, sex and so forth.

Based on these problems, the researchers are interested in investigating the factors affecting the caring behavior of the nurses working in Surabaya Jemursari Islamic Hospital. The factors being investigated were the individual characteristics comprising age, sex, level of education and emotional intelligence.

**Method**

The design of this study was analytical and observational done using a cross-sectional approach. The population involved in this study was all of the nurses and clients hospitalized in the medical and surgical room of Surabaya Jemursari Islamic Hospital. The population comprised of all nurses working in the medical and surgical room of the above stated hospital, totaling 44 people in which 40 respondents were chosen as the samples using simple random sampling technique. The independent variables comprised of the age, sex, level of education, and emotional intelligence of the nurses, whereas the dependent variable was the nurses’ caring behavior.

The independent variables comprised of age, sex, level of education and the emotional intelligence of the nurses, whereas the dependent variable was the nurses’ caring behavior.

This study used a questionnaire as the instrument to collect the data. The data of the independent variables, such as age, sex, level of education and emotional intelligence, was filled in by the nurses. Emotional intelligence refers to the dimensions of emotional intelligence developed by Goleman. The questionnaire consisted of 40 statements, comprising of 8 statements about emotion recognition, 8 statements about emotion management, 8 statements about self-motivation, 8 statements about empathy, and 8 statements about building a relationship with others. Moreover, a Likert scale 1-4 was used to score the answers. The scoring criteria for the positive statements was as follows: score 1 was very inappropriate, score 2 was inappropriate, score 3 was appropriate and score 4 was very appropriate. For the negative statements, scoring was done the other way around. This questionnaire has been tested resulting in the value of validity item (rit) being 0.332-0.665 and the value of Cronbach’s alpha was 0.893.

The data about the nurse’s caring behavior was measured based on the patient’s perception after the patients received nursing care 2 x 24 hours at minimum. Each nurse was judged based on his/her caring behavior by three former patients. The score for caring behavior was the average score accumulated from the three patients. The questionnaire used to score caring was based on Watson’s ten carative factors. The questionnaire about caring was adopted from the Caring Behaviors Inventory (CBI). This questionnaire contained 42 items and it had been tested resulting in the value of validity item (rit) of 0.155-0.696. The value of Cronbach’s alpha was 0.934. This questionnaire was based on Watson’s ten carative factors. This instrument had 5 dimensions, namely 12 statements about respectful deference through to the other 12 statements about the assurance of a human presence, 9 statements about positive connectedness, 5 statements about professional knowledge and skill and 4 statements about attentiveness to the other’s experience. All statements have been made in the positive form. The questionnaire used in this study was a Likert scale of 1 - 4. Score 1 is very inappropriate, score 2 is inappropriate, score 3 is appropriate and score 4 is very appropriate.

The preliminary data was analyzed using univariate analysis using percentages. Further, they were analyzed using the Chi-square test with a significance level of α = 0.05.

**Results**

**Nurse’s Characteristics:** The nurse’s characteristics comprised of age, sex, level of education and emotional intelligence have been shown in Table 1. Based on Table 1, most of the respondents (75%) were females, nearly all were (80%) > 25 years old, most (67.5%) had graduated with a Diploma 3 and most (60%) had high emotional intelligence.
Table 1: Frequency distribution of the respondents by age, sex, level of education and emotional intelligence for the nurses in the medical and surgical room of Surabaya Jemursari Islamic Hospital in March 2018

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
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<tr>
<td>Age (Year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;= 25</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>&gt;25</td>
<td>32</td>
<td>80</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma 3 Nursing</td>
<td>27</td>
<td>67.5</td>
</tr>
<tr>
<td>Ners Profession Program</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Emotional Intelligence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>High</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Nurse’s Caring Behaviors: The nurse’s caring behaviors based on Table 2 showed that most of the nurses (55%) had good caring behavior.

Table 2: Frequency distribution of the nurse’s caring behaviors based on the patient’s perception in the medical and surgical room of Surabaya Jemursari Islamic Hospital in March 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Nurse’s Caring Behaviors</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Poor</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>2.</td>
<td>Good</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Factors of the Nurse’s Characteristics Affecting their Caring Behaviors: The correlation between sex, age, level of education, emotional intelligence and the nurse’s caring behavior was presented in Table 3. Based on Table 3 for the sex factor, for the 10 male nurses, most of them (70%) had good caring behaviors. Among the female nurses, half of them (50%) showed good caring behavior, whereas the other half had poor caring behavior. Furthermore, the Chi-square test obtained the result that $p = 0.464 > \alpha (0.05)$, which meant that $H_0$ was accepted. There was no difference between the caring behaviors possessed by either the male or female nurses.

Based on Table 3 for the age factor, it was illustrated that among the 8 nurses <= 25 years old, most of them (75%) had good caring behavior. Of the nurses >25 years old, half of them (50%) also possessed good caring behavior, whereas the other half had poor caring behavior. Moreover, the Chi-square test obtained the result that $p = 0.258 > \alpha (0.05)$, which meant that $H_0$ was accepted. There was no difference found between the caring behaviors possessed by nurses in late adolescence (<=25 years old) and those aged >25 years (in early adulthood).

Based on Table 3, the level of education factor showed that among the 13 nurses who graduated from a Diploma 3 Nursing Program, most of them (54%) had poor caring behavior. For the nurses who graduated from the Ners Profession Program, most of them (59.3%) had good caring behaviors. The Chi-square test resulted in $p = 0.435 > \alpha (0.05)$, which meant that $H_0$ was accepted. There was found to be no difference between the caring behaviors possessed by the nurses who had graduated from D3 Nursing and those who had graduated from the Ners Profession Program.

The results related to the emotional intelligence factor illustrated that among the 16 nurses with lotional intelligence, nearly all of them (87.5) had poor caring behavior, whereas among the 24 nurses with high emotional intelligence, nearly all showed good caring behavior. The Chi-square test obtained a result of $p = 0.00 < \alpha (0.05)$, which meant that $H_0$ was rejected. There was a difference in the caring behaviors possessed by the nurses with both high and low emotional intelligence. The nurses with high emotional intelligence had a chance of showing good caring behavior 35 times more when compared to those with low emotional intelligence (OR = 35.00).
Table 3: Factors of the Nurse’s Characteristics Affecting the Caring Behaviors in the Medical and Surgical Room of Surabaya Jemursari Islamic Hospital in March 2018

<table>
<thead>
<tr>
<th>Nurse’s Caring Behaviors</th>
<th>Poor</th>
<th>Good</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>45</td>
<td>22</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;=25</td>
<td>2</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>&gt;25</td>
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</tr>
<tr>
<td></td>
<td>18</td>
<td>45</td>
<td>22</td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3 Nursing</td>
<td>7</td>
<td>54</td>
<td>6</td>
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<tr>
<td>Ners Profession Program</td>
<td>11</td>
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<td>16</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>45</td>
<td>22</td>
</tr>
<tr>
<td>Emotional intelligence</td>
<td></td>
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</tr>
<tr>
<td>Low</td>
<td>14</td>
<td>87,5</td>
<td>2</td>
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<tr>
<td>High</td>
<td>4</td>
<td>16,7</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>45</td>
<td>22</td>
</tr>
</tbody>
</table>

Discussion

Sex has no correlation with caring behavior. The result of the Chi-square test showed that p = 0.464 describes that there is no difference in the caring behaviors possessed by male and female nurses, despite the tendency of the male nurses having better caring behaviors than the females. This opposes the theory claiming that women have a maternal instinct, a soul for love and a mother’s affection for her family.12

Age also has no correlation with caring behavior (p = 0.258). In fact, the nurses aged 25 years or under and those aged above 25 years showed no difference in performing caring behaviors, even though those in late adolescence (<= 25 years) had a bigger opportunity to possess better caring behaviors than those aged above 25 (in early adulthood). The average age of the nurses working in Surabaya Jemursari Islamic Hospital was 30 years, in which the lowest age was 20 and the highest age was 35 years. All of the respondents were classified as being of a high productive age. BPS (Statistics Indonesia) differentiates people in Indonesia into 2 categories. The first group was for people of a high productive age (15 – 49 years), whereas the second refers to those of a productive age (50 – 64 years). At a high productive age, a person has the ability to make both products and services. To a nurse, the services will be better if they are balanced with good caring behavior. This is because it gives the patients satisfaction.8

Similarly, level of education does not affect caring behavior. No difference in the caring behaviors was found between the nurses holding a Diploma level 3 for Nursing and those who had graduated from the Ners program (p = 0.435). It is not in line with the results of the research conducted by Sunardi (2014), who stated that a higher level of education provides better caring behavior. Nurses possessing high education have careful considerations because of their wider knowledge and perception compared to those with a lower level of education. Higher education will correlate positively with the nurse’s caring behaviors.12

Emotional intelligence has a correlation with the nurse’s caring behavior (p = 0.000). Table 65.10 shows that among the 24 nurses who have high emotional intelligence, nearly all of them (83.3%) had good caring behaviors. High emotional intelligence covers the abilities of knowing one’s own emotions, controlling their
emotions, self-motivating, supporting and understanding other people’s emotions as well as maintaining a relationship with others. These are important abilities which must be possessed by each individual, especially nurses.\(^9\) An individual who has the ability to know his/her emotions will have more of an ability to know and anticipate how his/her actions influence others. A nurse with good sensitivity will be more sensitive to the needs of other people in turn. A nurse who has the ability to understand his/her own feelings will have more of an ability to control his/her own emotions so then he/she can perform actions and communications correctly and full of care. The nurse’s unawareness of being frustrated, disgusted, annoyed, angry or depressed resulting from a patient’s condition emerges from the inability to control their emotions. It may give negative impacts to patient. Good understanding and self-emotion acceptance will enable a nurse to understand the differences and uniqueness of their patients.\(^6\)

The nurse’s ability to understand and support other people’s emotion will create a nurse-patient relationship with an open atmosphere, where they trust and understand each other and share experiences between the nurse and his/her patient. Emotional intelligence is highly needed by a nurse for good interactions. During an interaction, a nurse must have empathy, control their emotions and know his/her and other people’s emotions to trust and help each other. By offering empathy to their patients, a nurse has the ability to give them affection in every decision and action that is taken, which is an important aspect of nursing care. Developing a relationship of trusting and helping each other is very important in transpersonal caring. Nursing care requires the figure of a nurse who has high emotional intelligence. From the patient’s perception, nursing care performed with perfect skills without good emotions is inadequate; it causes dissatisfaction. Caring behaviors that are supported by good emotional intelligence will create the healthcare expected by the patients.\(^9\)

**Conclusion**

The factor affecting the nurse’s caring behaviors was emotional intelligence. The nurse’s characteristics such as age, sex, and level of education did not affect the nurse’s caring behaviors. The nurses need self-training for better emotion control by recognizing and managing their emotions, by having the motivation to do their best, by developing empathy, by maintaining a relationship with others, and by learning from others who have succeeded in controlling their emotions.

The management of the hospital needs to carry out training programs in order for the nurses to manage their self-control and to provide their services with sincerity. **Ethical Clearance:** This research proposal was ethically reviewed by the research ethics committee of Surabaya Jemursari Islamic Hospital (ref: Certificate No. 00010/KEPK-RSI JS/II/2018) and it was certified as being ethically eligible. This research was beneficial. Each candidate received a sheet of information explaining the nature, reasons behind and volunteerism aspects of this research, as well as an informed consent and complaint form to provide the respondents’ confidentiality and code number.

**Source of Funding:** No funding support was provided for this research and the authors used self funding to conduct the research.

**Conflict of Interest:** The authors have declared there to be no conflict of interest within this publication.

**REFERENCES**


Using the Health Belief Model by Shadow Teachers in Identifying the Behavior of Children with Special Needs

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ABSTRACT

The identification of behavioral and emotional disorders of children with special needs in inclusive classroom learning by using the important health belief model approach is carried out by shadow teachers before starting learning. This is used to regulate and place children into different learning systems by adjusting for their needs in relation to meeting the learning outcomes. This study aims to explore the meaning of the shadow teacher’s experience in identifying the behavioral and emotional problems that occur when accompanying children with special needs at following along with the learning in inclusive classes with the health belief model approach. This study was a phenomenology qualitative study that used a purposive sampling technique. The data analysis used the Interpretative Phenomenology Analysis approach. Through in-depth interviews, observations and assistance from the note file, the population involved 7 participants who produced five themes. Three sub-themes were identified for perceived susceptibility: (1) lack of adherence to orders, (2) aggressive behavior, (3) difficulty expressing desires. Two sub-themes identified on perceived severity: (1) independence, (3) stigma. This study encourages the improvement of competence, especially the implementation of assessments when dealing with children with special needs, concerning the provision of adequate facilities and arrangements for inclusive learning and to raise public awareness of the acceptance of children with special needs in the community.

Keywords: Health Belief Model, Behavior, Children Special Needs

Introduction

The right of children with special needs to get formal education is like that of other normal children, thus encouraging the government to design formal schools with inclusive classes. Entry into inclusive schools is an important moment and a transition process for the social development of children with special needs. This is because it can produce assertive behavior and the identification of intellectual abilities. Behavior becomes very important before starting the learning process.¹ The biggest challenge that must be faced by companion teachers is the demand of meeting the achievements of learning for children with special needs, even without learning guidelines.² Not only is it required to be able to create an atmosphere so then the children with special needs feel that they are not the only ones who need special attention, but they also must be able to increase their potential, feel like those who are normal, feel accepted and valued in a social environment and able to provide motivation in children with special needs to allow them to be able to get a picture of themselves and live independently.²,⁴

During their participation in inclusive classes, children with special needs often experience various obstacles. Various barriers for children with special needs have been identified, including decreased physical condition, intellectual abilities, communication skills and decreased social and emotional conditions. There is a tendency towards them being opposing and solitary, and appearing different from normal children.⁵ The emergence of predominantly female (internalized and depressed) behavioral problems and externalizing (aggressive and hyperactive) behaviors dominated by boys will have an impact on social adaptation problems and academic achievement.⁶,⁷
Time allocation is very important in the learning of children with special needs. The least the accompanying teacher must spend more time on individual learning, small group teaching and cooperative learning. Accompanying teachers often experience burnout due to the tasks that must be carried out. It is very complex; besides educating, they are also teaching, guiding, directing, training and evaluating their development. The purpose of the study was to explore the meaning within the shadow teacher’s experience in identifying the behavioral and emotional problems that occur when accompanying children with special needs to follow learning in inclusive classes with the health belief model approach.

Method

This study used the Phenomenology Interpretive Approach. This was chosen to explore the experience of companion teachers in identifying the behavior of children with special needs while participating in inclusive learning through the health belief model approach. The pattern follows a reflection of the important themes that describe the phenomenon that occurs in children with special needs through writing that connects between the categories and orientation in the event experienced. We paid attention to the balance of the research theme by looking at each part as a whole.9,10

This technique used purposive sampling that met the inclusion criteria, namely that the participants were still active and recorded as the accompanying teacher, that they had at least 1 year of experience of accompanying children with special needs, that they were aged 35 - 50 years with a family with the consideration that individuals have entered the responsibility stage and who were willing to participate and share experiences as they assist children with special needs. A total of 9 participants were willing to become respondents, and only 7 participants were interviewed because they also achieved data saturation. All of the participants were interviewed and observed in two rounds by the researcher directly, using a tool in the form of field notes and a data recorder with a duration of 30 - 40 minutes.

This study collected the data through semi-structured interviews individually in March 2017. The data collection and data verification stages were carried out for 5 months. The interviews were recorded using a tape recorder, transcribed word for word and any nonverbal responses were recorded using note files and validated again with the participants as well as listening to the recording again. The questions in the interview included behaviors that describe the problems that occur in children with special needs in terms of seriousness, risk, the benefits of the actions given and any obstacles when assisting the children with special needs in participating in inclusive classroom learning.

The data analysis used the Interpretative Phenomenology Analysis approach. Following the guidelines for the data analysis from the interviews and field notes, the data was read carefully and repeatedly. The themes were interpreted to gain a sense of understanding and involvement, especially after being confronted with the data in the field notes. The validity of this research was evaluated using the concept of reliability, dependability, dependability and transferability.

Results

Seven out of the 9 participants took part in this study. The age range of the respondents was 35 - 50 years old with 1 male respondent and 6 female respondents with the special needs children being between 2 - 9 years old. Descriptions of the behavior of children with special needs can be explained by using the approach of the health belief model consisting of three sub-themes identified for perceived susceptibility: (1) less obedient at following orders, (2) aggressive behavior and (3) difficulty expressing desire. Two sub-themes were identified for perceived severity: (1) independence, (3) stigma.

Four categories were found in the children with special needs who had difficulty following orders and needed firmness, namely “Difficulty understanding instructions”, “Need a short order, clear and repeated”, “Orders must be written” and “there is a system of reward and punishment”:

“...He did not comply with the rules… we tried putting an understanding into them but it is too difficult” (P3)

“Autistic child indeed obey commands so long as it is as short as possible and as clear as possible and repeats” (P4).

“I made a program to make a schedule by the hour as soon… such as when studying in class. I put the paper form on his desk ‘pee is not in the garden, pee in the bathroom’” (P6)
“...he played with it and so we must take the cellphone. We have a reward and punishment system. First we might reprimand them and after the punishment, we give them an explanation” (P2)

There were three categories for the children with special needs who experience aggressive behavior.

“...sitting straight “yes” This (holding hands) know that he was immediately hit on the chest” (P6)

“His son is getting bigger and I am also a woman whose strength is not strong, sir. What is holding, yes, I bounced automatically…” (P5)

“...they behave like it is right… tantrums that yes, the angry autistic child was very bad indeed” (P1)

There were three categories found when the child expresses their heart:

“If it’s time to go to the library ... it’s not good. He is sometimes angry, sir, angry until he bangs on the door until sometimes he is hitting himself.” (P5)

“He wants something but he doesn’t want to say, he just approaches it” (P1)

Three categories were found for children with special needs whose lives depend on others:

“I have a very good voice, I taught tutoring.” At that time, my mind was like that” (P1)

“Parents who are protective of their child means that they are not allowed to do it themselves. Everything is done by their parents” (P2)

“Their enthusiasm is extraordinary, finally they are able to perform it is truly extraordinary” (P7)

There were two categories found in children with special needs that experience discrimination:

“People who do not understand say that such children should be ostracized and said that crazy person” (P3)

“Children with intellectual disruption… his social factors will also be disrupted, sometimes his treatment is unfair” (P2)

**Discussion**

This study resulted in five main themes related to the risks experienced by children with special needs that can be identified by the teacher assisting the children with special needs. The first theme is the difficulty of obeying orders. The accompanying teacher of children with special needs feels that children with special needs have difficulty understanding the instructions given. They must repeat the sentences and make sure that the command sentences are very short and clear. Concerning the difficulties obeying orders, there is a tendency for children with special needs not to obey rules or orders, which means that children with special needs try to avoid assignments. Various strategies and efforts need to be made by the accompanying teacher so then the children with special needs are obedient to the command.

Children with special needs to obey orders. It is necessary to form clear, strict orders and avoid multiple interpretations and orders would might be obeyed by children with special needs when only one specific command was given without any interpretation. The order would be followed by the children with special needs as the orders do not contain multiple choices and are given repeatedly. Companion teachers should directly correct destructive behavior to make a list of daily activities and to involve their parents in giving instructions so then children with special needs can learn to be obedient.

The participants agreed that children with special needs often experience aggressive behavior especially when experiencing tantrums, and even up to the point of attacking people. This behavior arises as a result of a failure to fulfill their desires because the language that is often used is non-verbal, so it is difficult to understand. Some of the aggressive behaviors in mentally disabled children where this behavior is the most common is shouting at everyone, which often disturbs other students who are considered weak, speaking disrespectfully to everyone, disobeying the rules at school and at home, and often swearing at everyone. The accompanying teacher must work with their parents to prevent challenging behaviors in children with special needs through self-assessment programs.

Non-verbal language is always used to express the desires of children with special needs. However, because of the interference in focusing, children with
special needs have difficulty expressing what they want. The results showed that to express desire, children with special needs often beat themselves, bang on doors and approach the desired target without saying anything. Children who have difficulty expressing their desires have Nonverbal Learning Disorders (NLD) with the characteristic of being unable to develop in the fields of social competence, academic performance, visual spatial ability, motor coordination and emotional functions. The introduction of letters from an early age is an effective means of language recognition in children with special needs.

This problem becomes very serious. This is because children with special needs are very dependent on others so they have difficulties when it comes to living independently. Some accompanying teachers agree that children with special needs are very dependent on others because of the difficulties of living independently. The results of the study show that children with special needs are always a burden on others, that they have difficulty doing things themselves but that when they are able to do good, they are extraordinary. The factors that affect children when it comes to being less able to be independent are the lack of vocabulary until the teacher trains them to understand conversations in maintaining learning involvement, behavior and motivation when completing tasks. Their parents are very important; this is first and foremost for children with special needs because it becomes the foundation from which to fulfill their needs to allow them to practice independence.

Stigma is a serious threat for children with special needs. Stigma arises because of the existence of prejudice and because of the poor assessment of children with special needs. They lose their identity as human beings who have dignity and a position in society. Children with special needs are children who have mental disorders that are often treated unfairly. The initial response when finding out that their child was born with a disability condition was that the parents refused their presence as if there was an abundant disaster. But the family members are not the same in responding to the presence of siblings who have disabilities. There are those who accept and those who refuse. Some parents blame themselves and experience severe psychosocial problems. The seclusion of children with special needs by the community means that the children with special needs lack opportunities to socialize. The result of the stigmatization of society is that children with special needs experience social constraints that have an impact on the atmosphere of feeling marginalized by community groups.

**Conclusion**

Difficulty in understanding orders, behaving aggressively and expressing the desires experienced by the children with special needs are the risks that must be experienced as they accompany mental emotional disturbances that have a serious impact on independence and exclusion in the community. This finding can inspire companion teachers to prepare children with special needs when attending inclusion class learning through self-oriented teaching to allow them to be able to meet their own needs without the assistance of other people and for them to able to socialize in the community. Besides that, it is also necessary to prepare the community to be able to accept the existence of children with special needs in the surrounding environment so then they can socialize with their peers without discrimination.

**Ethical Clearance:** This study was approved by the Health Ethics Committee of Brawijaya University, Malang.

**Source of Funding:** There was no funding support for this research. The author used self-funding to conduct the research.

**Conflict of Interest:** The authors declare that they have no conflicts of interest or financial interest in the preparation of this article.

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of Disability, Educators ’ Challenges of Including Children with Autism Spectrum Disorder in Mainstream Classrooms. 2015;(April).


Analysis of Factors Related to The Mother’s Behavior to Increase Breastmilk Production

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¹Faculty of Nursing Universitas Airlangga Surabaya Indonesia

ABSTRACT

The coverage of exclusive breastfeeding in Indonesia has not reached the national target set by the government. Problems that may inhibit exclusive breastfeeding include insufficient breast milk production. The purpose of this study was to analyze the factors related to maternal behavior in facilitating the production of breast milk based on the precede-proceed model. This study used a descriptive analytical design with a cross-sectional approach. The respondents consisted of 143 mothers collected with cluster sampling. The dependent variable in this research was the mother’s behavior in facilitating breast milk production. The independent variables in this research were knowledge, attitude, culture, the availability of health facilities, family support and health worker support. The data was collected using questionnaires and analyzed using Spearman rho’ with a significance level of α≤ 0.05. The results showed that almost all of the factors had a significant correlation with the mother’s behavior in facilitating breast milk production (knowledge p=0.039, attitude p=0.013, culture p=0.024, health facilities availability p=0.023, family support p=0.000). The factor of health worker support showed as having no correlation with the mother’s behavior in facilitating breast milk production (p=0.177). It is expected that the health workers at public health centers should increase their supports to mothers and their families about exclusive breastfeeding.

Keywords: breastfeeding, breastmilk production, precede-proceed model.

Introduction

The mother’s awareness of the importance of exclusive breastfeeding is able to increase the coverage of exclusive breastfeeding in Indonesia. Many women stop breastfeeding their babies because they think that their breast milk amount is insufficient to meet their baby’s needs. This phenomenon is in line with the research that showed that 20% of breastfeeding mothers stop breastfed due to the perception of having less breastmilk production, periods of vulnerability for breastfeeding cessation, reasons for breastfeeding cessation, and the association between predelivery intentions and breastfeeding behaviors. STUDY DESIGN Using 2 years (2000 and 2001)

Based on the Surabaya City Health Profile, there is one area that showed a significant decline in exclusive breastfeeding coverage over the last 3 years. The exclusive breastfeeding coverage in this area only reached 43.53% in 2015. This is precisely inversely proportional to the coverage of exclusive breastfeeding in Indonesia, which reached 55.7%. The exclusive breastfeeding coverage in Surabaya also increased by 60.52% in 2012, by 64.33% in 2014 and in 2016 this increased to 65.10%. The coverage of exclusive breastfeeding in Indonesia has indeed increased but it is still very far from the target set by the government nationally, which is 80% of the number of babies in Indonesia. Based on preliminary studies conducted in the area, only 21 out of 78 infants aged 0 - 6 months who exclusively breastfed, and 9 out of 10 mothers stated that they only produce less breastmilk. It can thus be concluded that 90% of breastfeeding mothers experience problems with less breastmilk production.

Babies who do not breast feed tend to be easily at risk of infection or disease. The impact of not exclusive breastfeeding concerning infants includes indigestion,
impaired growth, an increased risk of morbidity in infants and nutritional disorders, including being at risk of aggravating ARI and diarrhea. Mothers who understand the importance of exclusive breastfeeding for their babies will try to improve and facilitate their breast milk production. Consuming traditional herbal medicines such as katuk leaves (*Sauropus androgynous*) or green vegetables and nuts are some common behaviors in the mothers in Indonesia when trying to increase breastmilk production.

The mother’s behavior is a kind of formed behavior that could be influenced by predisposing, supporting and driving factors. Based on the theory of Precede-Proceed by Lawrence Green, a person’s behavior can be concluded to be influenced by knowledge, attitudes, traditions or culture, family support, the availability of health facilities and the performance of health workers. This study is focused on analyzing the factors of knowledge, attitudes, culture, the availability of health facilities, family support and health worker support, which can influence the behavior of the mothers in facilitating the production of breast milk based on the theory of the Precede-Proceed Model.

### Method

This study used descriptive analysis with a cross-sectional approach. The research was conducted at one of the Health Centers in Surabaya, during June - July 2018. The population in this study consisted of 228 nursing mothers. The sample consisted of 143 mothers who had problems with breast milk production carried out by cluster sampling.

The dependent variable in this study was the behavior facilitating breast milk production. The independent variables in this study were knowledge, attitude, culture, the availability of health facilities, family support and health worker support. The instruments in this study used questionnaires which had already been tested for validity and reliability. The data was collected by doing visiting the respondent’s house. This was then analyzed using Spearman rho with a 95% confidence level.

### Results

The demographic data of breastfeeding mothers in this study has been shown in Table 1.

<table>
<thead>
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<th>Characteristic</th>
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</tr>
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</tr>
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<td>20 – 35 years</td>
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<tr>
<td>&gt; 35 years</td>
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<tr>
<td><strong>Educational Background</strong></td>
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<td>Primary School</td>
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<td>Diploma/College</td>
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<td><strong>Employment</strong></td>
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<td>Housewife</td>
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<td>Private</td>
<td>18</td>
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<tr>
<td>Entrepreneur</td>
<td>4</td>
</tr>
<tr>
<td>Government employees</td>
<td>4</td>
</tr>
<tr>
<td><strong>Number of children</strong></td>
<td></td>
</tr>
<tr>
<td>1 child</td>
<td>39</td>
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<tr>
<td>2 children</td>
<td>61</td>
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<tr>
<td>&gt; 2 children</td>
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<tr>
<td><strong>Infant Gender</strong></td>
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<td>Boy</td>
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<td>Girl</td>
<td>75</td>
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<td><strong>Age of babies</strong></td>
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<td>&lt;6 months</td>
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<td>&gt;6 months</td>
<td>61</td>
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<tr>
<td><strong>Type of labor</strong></td>
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<tr>
<td>Normal</td>
<td>96</td>
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<tr>
<td>SC (<em>Sectio Caesaria</em>)</td>
<td>47</td>
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<tr>
<td><strong>Type of breastfeeding</strong></td>
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<td>Exclusive breastfeeding</td>
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<tr>
<td>Non exclusive breastfeeding</td>
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<td>Government employees</td>
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<td><strong>Family income (IDR)</strong></td>
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<td>&lt;3,500,000</td>
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</tr>
<tr>
<td>3,500,000</td>
<td>38</td>
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<tr>
<td>&gt;3,500,000</td>
<td>47</td>
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<td><strong>Sub-district</strong></td>
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<tr>
<td>Ngagel</td>
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Table 2: Correlation between the factors of the preceed-proceed model with the mother’s behavior in accelerating breast milk production

<table>
<thead>
<tr>
<th>Factors on Preceed-Proceed Model</th>
<th>Mother’s Behavior in Accelerating Breastmilk Production (n=143)</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Total</th>
<th>Spearman Rho'</th>
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<tr>
<td><strong>Knowledge</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>0 (0%)</td>
<td>13 (9.1%)</td>
<td>0 (0%)</td>
<td>13 (9.1%)</td>
<td>p = 0.039</td>
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<tr>
<td>Good</td>
<td></td>
<td>1 (0.7%)</td>
<td>94 (65.7%)</td>
<td>35 (24.5%)</td>
<td>130 (90.9%)</td>
<td>r = 0.173</td>
</tr>
<tr>
<td><strong>Attitude</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>0 (0%)</td>
<td>18 (12.6%)</td>
<td>0 (0%)</td>
<td>18 (12.6%)</td>
<td>p = 0.013</td>
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<tr>
<td>Positive</td>
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<td>1 (0.7%)</td>
<td>89 (62.2%)</td>
<td>35 (24.5%)</td>
<td>125 (87.4%)</td>
<td>r = 0.208</td>
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<td><strong>Culture</strong></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Negative</td>
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<td>0 (0%)</td>
<td>21 (14.7%)</td>
<td>1 (0.7%)</td>
<td>22 (15.4%)</td>
<td>p = 0.024</td>
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<td>1 (0.7%)</td>
<td>86 (60.1%)</td>
<td>34 (23.8%)</td>
<td>121 (84.6%)</td>
<td>r = 0.189</td>
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<tr>
<td><strong>Availability of health facilities</strong></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Poor</td>
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<td>0 (0%)</td>
<td>1 (0.7%)</td>
<td>0 (0%)</td>
<td>1 (0.7%)</td>
<td>p = 0.023</td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>0 (0%)</td>
<td>25 (17.5%)</td>
<td>2 (1.4%)</td>
<td>27 (18.9%)</td>
<td>r = 0.190</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>1 (0.7%)</td>
<td>81 (56.6%)</td>
<td>33 (23.1%)</td>
<td>115 (80.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Family Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td>0 (0%)</td>
<td>2 (1.4%)</td>
<td>1 (0.7%)</td>
<td>3 (2.1%)</td>
<td>p = 0.000</td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>0 (0%)</td>
<td>85 (59.4%)</td>
<td>14 (9.8%)</td>
<td>99 (69.2%)</td>
<td>r = 0.311</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>1 (0.7%)</td>
<td>20 (14.0%)</td>
<td>20 (14.0%)</td>
<td>41 (28.7%)</td>
<td></td>
</tr>
<tr>
<td><strong>Support from the health workers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td>1 (0.7%)</td>
<td>11 (7.7%)</td>
<td>6 (4.2%)</td>
<td>18 (12.6%)</td>
<td>p = 0.177</td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>0 (0%)</td>
<td>89 (62.2%)</td>
<td>21 (14.7%)</td>
<td>110 (76.9%)</td>
<td>r = 0.114</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>0 (0%)</td>
<td>7 (4.9%)</td>
<td>8 (5.6%)</td>
<td>15 (10.5%)</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

Most of the breastfeeding mothers in this research had a good level of knowledge about the importance of breastfeeding for both the mother and baby, the things that can affect breast milk production and how to increase their own breastmilk production. Most respondents who have good knowledge have sufficient behavior when it comes to the effort to increase breastmilk. The statistical results obtained a significance correlation between knowledge and maternal behavior in increasing breastmilk production. The majority of breastfeeding mothers in this study were highly educated, having graduated from high school (62.2%) and college (21.7%). The level of education is very influential on knowledge, especially in the formation of behavior. The higher the level of education of a person, the higher the level of one’s consciousness and the more mature they are in terms of decision making. Mothers who have a high education level are predicted to show a more persistent effort to achieve breastfeeding success compared to someone with a low level of education. Mothers who have a higher level of education will find it easier to find information about breastfeeding which will increase their confidence in breastfeeding their babies. Mothers who have higher education tend to be stronger to deal with problems and difficulties, including dealing with less breastmilk production. There were under 6 month old babies already being given formula milk. The reasons were having a lower level of breastmilk production and being working mothers. This is in line with the research that stated that 24% of working mothers reported that they were not sure they could produce enough milk for their babies. This indicates that counseling and support about lactation are still very needed by working mothers to reach the exclusive breastfeeding target. The better the mother’s knowledge about how to increase their milk production, the better the behavior of mothers in increasing breastmilk production.
The majority of nursing mothers in this study had a positive attitude and behaved in sufficient categories. The statistical results obtained a significance correlation between attitude and maternal behavior in facilitating breast milk production. There are still a small number of mothers who gave additional food and formula milk while still breastfeeding their babies. This is consistent with the previous research that states that one of the reason mothers give up on exclusive breastfeeding is because of the mother’s perception of breastmilk production. A positive attitude will develop positive behavior and vice versa. Good mother’s knowledge will also affect the mother’s attitude when it comes to being positive. Attitude is a closed response to a stimulus or a particular object which involves the factors of opinion and the emotions concerned (happy-unhappy, agree-disagree, all right and so on). The factors that influence the formation of attitudes are personal experience, culture, other people who are considered to be important, mass media, educational institutions or institutions, religious institutions and individual emotional factors.

There is a significant correlation between cultural factors and maternal behavior in facilitating breast milk production. The culture that is trusted by the mothers and their family will greatly affect the behavior of the mothers in increasing their breastmilk production. Nursing mothers who have a positive culture facilitating breast milk production will behave in sufficient categories to facilitate breastfeeding; out of the respondents, this totaled 60.1%. Positive behavior to increase breastmilk production is affected by culture/beliefs, including by consuming herbal medicine both factory packaged or homemade (54.5%), doing gently breast massage care (66.4%) and consuming more green vegetables and fruits (74%). There also some mothers who believe that breastfeeding could change the beautiful shape of their breasts (10.4%) and that during breastfeeding, they should restrict themselves when it comes to spicy foods due to the prevention of diarrhea among their babies (66.4%).

The statistical test obtained a significant correlation between the availability of health facilities and the mother’s behavior in facilitating breast milk production. The health facilities can be easily reached, while health education and postpartum maternal visits were also obtained by most of the respondents in this study. The health facilities are support for the occurrence of a person’s behavior or society. Facilities can be in the form of time, money, energy, tools and skills. Health behavior will be influenced by the presence or absence of health facilities. The availability of supporting facilities will help the nursing mothers to reach the point of exclusive breastfeeding, especially for working mothers. Numbers of women living as a worker and a housewife have increased. This also increases the potential risk of breastfeeding discontinuation. Three months of maternal leave policy and inadequate lactation promotion support in workplace have been identified as factors that hinder lactating practices. The World Health Organization recommendation of 6 months of exclusive breastfeeding and joined regulation of three Indonesia ministers (Ministry of Health, Ministry of Labour, and Ministry of Women Empower

The majority of respondents get sufficient family support in the enough category. The statistical results also indicate there to be a significance correlation between family support and maternal behavior in facilitating breast milk production. The family in this study were the husband, biological mother, mother-in-law, brother and closest person who lived in one house with the respondent. One form of family support for nursing mothers is to provide assistance in the form of material, physical assistance and assistance when it comes to solving problems. Support and family presence is very important for nursing mothers to be able to increase self-confidence, stabilize emotions, and provide strong motivation. Support from husbands and biological mothers is more dominant in influencing mother’s behavior. Husbands who help with housework, take care for babies and give their wives praise will increase their happiness and create a comfortable atmosphere. Mothers who received support from their husbands were 10 times more likely to report confidence in their breastfeeding than those who did not.

The statistical results obtained that there was no significant relationship between health worker support and the mother’s behavior in facilitating breast milk production. This could be caused by less encouraging the mother’s spirit and less convincing her that her breastmilk production is sufficient enough to meet the baby’s needs. The role of health workers in improving public health is needed. Health workers, especially those working in first line services, will interact more often with the community because they are the first and closest
health provider to the community. Nurses can act as health care providers through the roles of nursing care, educators, health educators, case inventors, liaisons, coordinators, counselors and general role models. The role of health workers should be to provide strong support for exclusive breastfeeding success. The support that can be done by the health workers is by holding counseling about lactation management during antenatal, intra-natal and postnatal, hence being a good preparation stage for the mothers and their families to reach the point of exclusive breastfeeding.\(^{16}\)

### Conclusion

Knowledge, attitude culture, the availability of health facilities and family support are the factors that contribute to forming good behavior in breastfeeding mothers in terms of increased breastmilk production. The support of health workers had no significant correlation with the behavior of mothers in facilitating breast milk production because of the incomprehensive information and support about exclusive breastfeeding.

**Ethical Clearance:** This research passed the ethical clearance of the Health Research Ethics Commission in the Faculty of Nursing, Universitas Airlangga certificate no. 943-KEPK.

**Source of Funding:** None

**Conflict of Interest:** None

**REFERENCES**


An Effect of Breath Dhikr on the Stress Level of Patients with Pulmonary Tuberculosis

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¹Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Pulmonary tuberculosis is an infectious chronic disease that can cause a stress condition on patients, such as the symptoms of tuberculosis disease, the long treatment process with a large amount of drugs, daily activity disruption, job loss and death threats. Unresolved stress can lead to irritability, anxiety, negative thinking, despair and helplessness. Some even blame God.

Objective: This study aimed to determine the effect of dhikr breath on the stress levels of patients with pulmonary tuberculosis in the public health centres of Tanah Kalokedinding Surabaya.

Method: A quasi-experimental design method with pre- and post-control groups was used. There was a treatment group and a control group; each group consisted of 16 respondents. The data analysis was performed using the Wilcoxon Signed Rank test and the Mann Whitney U test with a significance level of \( p < 0.05 \).

Results: The result of the Wilcoxon Signed Rank test showed that the stress level of the treatment group had significance with \( p = 0.000 \). The control group had no significance; \( p = 0.317 \). The Mann Whitney U test showed the differences in the stress levels post-intervention with \( p = 0.000 \).

Discussion: Dzikir breath was a positive stimulus that affected the cognator process according to Roy’s adaptation theory in the form of merging dhikr and breath, which is aimed at realizing God. Further research is expected to use cortisol measurements to obtain more accurate results. This should be performed at stress levels in other chronic disease patients.

Conclusion: Breath Dzikir is a spiritual therapy that can change stress into eustress (positive stress) and decrease the stress level of pulmonary tuberculosis patients overall.

Keywords: Breath Dhikir, Stress, Pulmonary Tuberculosis

Introduction

Pulmonary tuberculosis, in addition to having an impact on the physical body, can also result in psychosocial or psychological problems that can lead to mental disorders (severe depression).¹Psychosocial problems such as stigma in society, the fear of being incurable, feeling isolated, not being confident and economic problems, can cause stress for the sufferers.²Unresolved stress will stimulate the hypothalamus to secrete corticotropin releasing factor (CRF), thus causing the pituitary gland to secrete adrenocorticotropic hormone (ACTH) and stimulating the adrenal cortex to secrete cortisol.³An increase in excessive cortisol secretions causes complications, namely a decrease in the immune system and an excessive metabolism.⁴

The prevalence of stress in pulmonary TB patients is 90%, varying from moderate to severe.⁴Stress manifestations can be shown physically, psychologically and through behavior because of the conditions that they experience, such as symptoms of TB-related illnesses, long treatment processes with large amounts of medication, the disruption of daily activities, stigma in society and threats of death.⁴Stress that is not dealt with
properly can lead to anger, anxiety, negative thinking, despair and a sense of helplessness. Some even blame God. This condition can result in irregular pulmonary TB patients taking medication and even discontinuing medication, which will later affect their quality of life.7

One way of handling stress is through a spiritual approach or psychiatric therapy. This can form adaptive coping to help the pulmonary TB patients when dealing with the stress experienced.8 9The religious psychological therapy that the researchers use is breath dzikir. Breath remembrance is a combination of dzikir and deep breaths which can make an individual sincere, grateful and trigger a relaxed state so as to reduce stress. This can even help in controlling one’s emotions.10 The research used Roy’s adaptation theory framework. This is because spiritual therapy through psychology with the method of dhikr is a therapy that can improve individual positive coping mechanisms.8 Previous studies have proven the benefits of reducing stress and anxiety through psychological therapy, especially the method of dhikr. Dhikr relaxation can reduce the stress in patients with essential hypertension.11

Method

This study aimed to prove the influence of breath dzikir in reducing the stress levels in pulmonary tuberculosis patients. A quasi-experiment method with a pre- and post-test control group design was used. The period of research was February to May 2018.

Sample: The research samples consisted of pulmonary TB patients in the area of Tanah Kalikedinding Health Center in Surabaya taken using non-probability sampling (purposive sampling). The size needed for each group, both the intervention and control group respectively, was 16 people. The inclusion criteria were pulmonary TB patients who experienced moderate to very severe stress, Muslim and aged between 17 - 64 years. The exclusion criteria included pulmonary TB patients with severe psychiatric disorders or mental disorders, severe complications such as pleurisy, pleural effusion or carcinoma, who had MDR and who had severe comorbidities such as HIV or AIDS.

Research Instrument and Data Analysis: The instrument used to measure the dependent variable was the stress level questionnaire sheet Depression Anxiety Stress Scale 42 (DASS 42). It was been tested for validity and reliability12 with 10 respondents with the same characteristics; the results obtained r values of 0.64 - 0.76 (r> 0.63) and a Cronbach’s alpha result with a reliability of 0.938 (α> 0.6). The researcher used 14 stress scale items from DASS 42, which were later modified to make them easier to understand.

The data analysis was performed using the Wilcoxon Signed Rank test and Mann Whitney U test with a significance level of p <0.05. All of the statistical tests were measured using the Statistical Package for the Social Science (SPSS) version 16.0.

Results

The pulmonary TB patients who suffered from the disease and who experienced stress consisted of 18 female from the age >45 years; 18 people had a high school level of education, 26 people were married, 20 people were unemployed and 20 people were from the latent treatment phase (Table 1). The type of stress most experienced was psychological (emotional) stress in both groups (Table 2 and Figure 1).

Table 1: Demography of the Respondents

<table>
<thead>
<tr>
<th>No.</th>
<th>Demography</th>
<th>Group</th>
<th>Treatment</th>
<th>%</th>
<th>Control</th>
<th>%</th>
</tr>
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<td></td>
<td></td>
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<td>43.75</td>
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<td>43.75</td>
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</tr>
<tr>
<td></td>
<td>Female</td>
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<td>56.25</td>
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</tr>
<tr>
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<td>Total</td>
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<td>16</td>
<td>100</td>
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<tr>
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<td>26-35</td>
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<tr>
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<td>36-45</td>
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<td>1</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;45</td>
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<td>18.75</td>
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<td>100</td>
<td>16</td>
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<td>7</td>
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<td>Entrepreneur</td>
<td>0</td>
<td>0</td>
<td>4</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>3</td>
<td>18.75</td>
<td>5</td>
<td>31.25</td>
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</tr>
<tr>
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<td>Total</td>
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<td>100</td>
<td>16</td>
<td>100</td>
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<td>6.</td>
<td>Medical Phrase</td>
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</tr>
<tr>
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<td>Intensive (0-2 Month)</td>
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<td>37.5</td>
<td>6</td>
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<tr>
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<td>Latent (3-6 Month)</td>
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<td>62.5</td>
<td>10</td>
<td>62.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
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<td>100</td>
<td>16</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Types of Stress Level for all of the respondents before and after the intervention

<table>
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<th>Responden</th>
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<td>SPsi</td>
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<td>P9</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>P10</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>P11</td>
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<td>15</td>
</tr>
<tr>
<td>P12</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>P13</td>
<td>3</td>
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<td>2</td>
<td>15</td>
</tr>
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<td>K1</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>K2</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>K3</td>
<td>4</td>
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<td>16</td>
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<tr>
<td>K7</td>
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<td>15</td>
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<tr>
<td>K8</td>
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<td>14</td>
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<tr>
<td>K9</td>
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<tr>
<td>K10</td>
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<td>13</td>
</tr>
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<td>K11</td>
<td>2</td>
<td>16</td>
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<tr>
<td>K12</td>
<td>4</td>
<td>12</td>
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<tr>
<td>K13</td>
<td>4</td>
<td>14</td>
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<tr>
<td>K14</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>K15</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>K16</td>
<td>4</td>
<td>13</td>
</tr>
</tbody>
</table>

Keterangan:

- Stress Score:
  - SF : Physiology Stress Normal (0-14)
  - SPsi: Psycology Stress Low (15-18)
  - SPer: Behavorial Stress Moderate (19-25)
  - Severe (26-33)
  - Very Severe (>33)

- SF : Physiology Stress
- SPsi: Psycology Stress
- SPer: Behavorial Stress
Before being given the breath dzikir intervention, most of the respondents in the treatment group had moderate stress levels. The stress levels in the treatment group consisted of 15 respondents (93.75%) with moderate stress levels and 1 respondent (6.25%) with severe stress levels. In the control group, 16 respondents (100%) had moderate stress levels (Table 3). After being giving the breath dzikir intervention in the treatment group, the stress level of the group decreased, although there was a respondent, the sixth, whose stress level was still constant. The results of the Wilcoxon signed rank test between the pre- and post-test was $p=0.000$. This means that H1 was accepted and that there was a significant influence from dzikir breath on the decreased stress levels. In the control group, there was no significant difference found in the stress level of the respondents. The Wilcoxon signed rank test statistic had a value of $p=0.317$. This means that there was no change in the stress levels in the control group of respondents.

Table 3: Analysis of the stress levels of all respondents before and after the intervention

<table>
<thead>
<tr>
<th>Stress Level</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment Group</td>
</tr>
<tr>
<td></td>
<td>Pre-Test</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
</tr>
<tr>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>15</td>
</tr>
<tr>
<td>Severe</td>
<td>1</td>
</tr>
<tr>
<td>Very Severe</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

Wilcoxon $p = 0.000$  
Mann Whitney Before The Breath Dzikir $p=0.780$  
After The Breath Dzikir $p=0.000$

The stress level both of groups before the intervention was not significantly different. This was indicated by the results of the Mann Whitney U test with a value of $p=0.780$. This meant that there was no significant difference between the stress level of the treatment group and the control group before being
given the intervention in the form of breath dhikr. The results of the statistical test after being given the breath dhikir intervention showed a value of \( p=0.000 \). This is smaller than 0.05, meaning that there was a significant difference in the stress level of the treatment group and the control group after being given the intervention.

**Discussion**

Based on Roy’s adaptation theory which states that some people do not have an effective coping system, the stress experienced can cause maladaptive psychological processes and self-concepts. The cognator system in the psychological processes that experience stress are closely related to mood and the mind, giving rise to bad moods dominated by negative thoughts and anxious feelings. Stress conditions that are not properly addressed will interfere with one’s physiological conditions as well, which stimulates the hypothalamus to secrete corticotropin releasing factor (CRF). This causes the pituitary gland to secrete adrenocorticotropin releasing hormone (ACTH). This stimulates the adrenal cortex to secrete cortisol. An increase in excessive cortisol secretion in pulmonary TB patients can lead to complications, a decreased immune system and an excessive metabolism. According to Roy’s theory, a human is seen of as a system of adaptation. This theory aims to help the patients adapt to changes in their physiological needs, self-concept, role function and any interdependent relationships during health and illness. Therefore humans are actually able to adapt to the stressful conditions that they are experiencing if they have effective coping methods.

One effective method of coping and dealing with spiritual-based stress is psychoeligious dhikir breath therapy. Breath Dzikir is a method of combining dhikir and deep breaths, which can make individuals sincerely accept, give thanks, increase confidence and trigger a relaxed state, thereby reducing stress and even helping in controlling one’s emotions. Spiritual factors contribute to the healing process of clients. Even those who are religious are better able to cope with suffering and the healing process is faster. Increasing the spiritual factors is also intended to maximize the benefits of experience, treatment and a feeling of peace for the patients. Breathdhzikir can be used as one of the complementary therapies to overcome the emotional problems that are proven to reduce the stress level of respondents in this study.

Dhikr contains elements of spirituality or religion that can arouse self-confidence and faith in the person who is sick. As the immune system increases, this accelerates the healing process. A positive emotional response from the influence of the therapy of breath dhikr runs in the body and is received by the brain stem. After being formatted into the language of the brain, it is then transmitted to one part of the cerebrum, the hypothalamus. The hypothalamus then transmits impulses to the hippocampus (a vital memory center that coordinates everything that is absorbed by the senses) to secrete GABA (Gama Amino Batiric Acid). GABA acts as a controller of emotional responses. It also inhibits or reduces the activity of the neurons or nerve cells, CRH and other producing neurotransmitters cortisol and stress hormones. There will be a process of homeostasis and the repairing of the disrupted neurotransmitter system, giving rise to optimism, eliminating negative thoughts and generating positive thoughts. All protectors in the human body work with obedience to worship, such as getting closer to Allah SWT. There is the creation of an atmosphere of balance from the neurotransmitters in the brain. Hormone stability and reduced stress can cause eustress in pulmonary TB patients.

The results of this research are in accordance with several studies’ results, in which dhikir can reduce stress and increase the positive response of someone who has a problem. Previous research has focused on patients with kidney transplants who experience stress; it was found that the higher a person’s spirituality, the better they are coping and dealing with problems. Spirituality can also improve quality of life and reduce the anxiety and depression of patients who have cancer. Breath remembrance is a spiritual therapy, so it can therefore reduce stress levels in pulmonary TB patients as evidenced by the significant reduction in stress levels in the treatment group. In the control group, they did not experience a decrease in stress levels. The decrease in stress levels in the treatment group was because the respondents carried out breathing dhikir in earnest and according to the guidelines that the researcher gave 2 times a day for 7 days for ± 10 minutes each time. The more frequently that dhikir is done, the lower the anxiety that someone experiences.

**Conclusion**

Breath Dzikir is a spiritual therapy that can change stress into eustress (positive stress) and decrease the stress level of pulmonary tuberculosis patients.
Ethical Clearance: This study received a certificate of ethical clearance from the Ethical Commission of Fakultas Keperawatan, Universitas Airlangga Indonesia No: 999-KEPK on 11th July 2018.

Source of Funding: This study received no external funding.

Competing Interests: The authors declare that they have no competing interests.

REFERENCES


Family Burden Effect on the Ability in Taking Care of Schizophrenia Patient

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¹Masters Degree Programs, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia; ²Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

The existence of schizophrenia affects family systems and the ability to care. The study aimed to determine the relationship between family burden and the familial ability to treat schizophrenic patients. The design used was descriptive analysis with a cross-sectional approach. The population consisted of the family of schizophrenic patients in Menur Mental Hospital, Surabaya, Indonesia. In total, 21 respondents were obtained through consecutive sampling. The independent variable was the family burden and the dependent variable was the ability of the family to care for schizophrenic patients. The data was collected using a questionnaire and the results were analyzed using the Spearman Rho correlation test. The results showed that burden has a moderate relationship with the family ability (p = 0.008) (r = 0.656). The subjective burden was greater than the objective one. A lower burden felt by the family will improve their caring abilities. The families should be able to manage their existing and objective goals so then they can treat schizophrenia patients well.

Keywords: subjective burden, objective burden, schizophrenia, Indonesia

Introduction

Schizophrenia is one type of mental disorder that is causing a serious problem. The maladaptive behavior of schizophrenia patients has become a family burden that produces stressor. The burden faced by the family causes high family stress.¹⁻³ The perceived burden of the family can be either objective or subjective.⁴ Objective burdens can be limited social relations and work activities, financial difficulties and disturbing the physical health of the family members while the subjective burden can be a feeling of loss, sadness, anxiety, embarrassment and stress. The high burden felt by the family affects the willingness of the families to care for the patient and this often leads to recurrence in patients. Schizophrenia patient recurrence contributes to high schizophrenia rates both nationally and globally.

The prevalence of severe mental disorders including schizophrenia in Indonesia according to Riskesdas is 1.7 per 1000.⁵ The incidence of schizophrenia in East Java was 0.22% while in Surabaya, it was 0.2%. Data from the Menur Mental Hospital Surabaya from January until March 2016 showed that there were 5,819 patients; 90% were schizophrenic and 80% of them had relapsed. The incidence of schizophrenia is difficult to decrease due to high recurrence rates. The causes of recurrence were due to not taking their medication and contacting the doctor regularly, stopping the drug immediately, a lack of support from their family and the existence of severe problems that create a stress relapse in the client.⁶⁻¹⁰

People with schizophrenia will be abnormal in their functionality in their daily activities. The family should do the tasks such as recognizing family problems, making the decision to take appropriate actions, taking care of their family members, modifying a healthy family environment and utilizing health service facilities. This high burden is a factor that affects the intention of the family to carry out the task of caring for schizophrenic patients. The stronger the intention, then there is also an impact on how strong the family belief is when it comes to showing the ability to care for schizophrenic clients.⁷¹¹ This study wants to explain the relationship between family burden with family ability to care for patients with Schizophrenia.

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Method

Study Design, Setting and Sampling: The research used a descriptive correlational research design with the cross-sectional approach. The population consisted of the family of schizophrenic patients who were treated at Menur Mental Hospital in Surabaya. The sample totaled 21 respondents obtained through the consecutive sampling technique.

Study Variables: The independent variable was a family burden and the dependent variable was family ability in taking care for Schizophrenia patient. The family burden was measured by a modification of the Caregiver Burden Index questionnaire. The family ability variable questionnaire was developed based on the concept of the family task which as modified for families with schizophrenia.

Data Analysis: The data obtained was then analyzed using the Spearman Rank test with a significance $\alpha \leq 0.05$.

Results

Based on Table 1, it can be explained that the majority of respondents (62%) were siblings; 29% were 20-30 years old, 48% were working as employees and earned 500.000-1.000.000 rupiahs every month.

Respondents’ (family) characteristics

Table 1: Characteristics of the respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship</td>
<td>Husband</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Wife</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Father</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Mother</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Siblings</td>
<td>13</td>
<td>62%</td>
</tr>
<tr>
<td>Age</td>
<td>20-30</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>5</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>Education</td>
<td>Elementary</td>
<td>7</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Junior High School</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Senior High School</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>College/University</td>
<td>5</td>
<td>24%</td>
</tr>
</tbody>
</table>

Table 2: Characteristics of the patients

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Man</td>
<td>14</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Woman</td>
<td>7</td>
<td>33%</td>
</tr>
<tr>
<td>Education</td>
<td>No</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Elementary</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>Junior High School</td>
<td>7</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Senior High School</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>College/University</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Age</td>
<td>&lt;=20</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>21-30</td>
<td>8</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>&gt;50</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Marital Status</td>
<td>No</td>
<td>13</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td>Merit</td>
<td>5</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Widow</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Widower</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Suffering Time</td>
<td>1-10 years</td>
<td>14</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>11-20 years</td>
<td>5</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>21-30 years</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>&gt;30 years</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>Relapse</td>
<td>once</td>
<td>13</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td>twice</td>
<td>5</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>&gt;twice</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Treatment</td>
<td>Routine</td>
<td>8</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Not</td>
<td>13</td>
<td>62%</td>
</tr>
</tbody>
</table>

Table 2 shows that the majority of schizophrenic patients (67%) were male, 21-30 years old, 33% had been to junior high school, 38% were unmarried and 67% had experienced a mental disorder for 1-10 years.
Family Burden in Caring for Schizophrenia Patients

Table 3: Family burden

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Burden</td>
<td>Mild</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>9</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 3, all of the respondents are experiencing a burden mostly at moderate (43%) and mild (48%) levels. The burden has been described in Table 4.

Table 4: Description of the family burden

<table>
<thead>
<tr>
<th>Family Ability</th>
<th>Category</th>
<th>Subjective</th>
<th>Psychological</th>
<th>Mind</th>
<th>Objective</th>
<th>Physical</th>
<th>Social</th>
<th>Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
</tr>
<tr>
<td>Subjective</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>48</td>
<td>10</td>
<td>48</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>Psychological</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>43</td>
<td>11</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mind</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>43</td>
<td>11</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>15</td>
<td>71</td>
<td>4</td>
<td>19</td>
<td>2</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>10</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>8</td>
<td>38</td>
<td>11</td>
<td>52</td>
<td>2</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>4</td>
<td>19</td>
<td>12</td>
<td>57</td>
<td>5</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 explains that the subjective burden is the highest. Most of the burden is within the psychological and mind burden categories.

Family Ability in Taking Care of Schizophrenia Patients.

Table 5: Family Ability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Ability</td>
<td>Less</td>
<td>9</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5 shows that most of the respondents have either a moderate (48%) or lesser (43%) ability to take care of their patients. The distribution of the family ability has been described in Table 5.

Based on Table 6, it can be explained that most of the families are caring very well for the schizophrenic family member (52.4%). However, there are 66.7% families who are not making the decision to solve the problem and modify the environment (66.7%).

Table 6: Distribution of family ability

<table>
<thead>
<tr>
<th>Family Ability</th>
<th>Category</th>
<th>Good</th>
<th>Moderate</th>
<th>Less</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
<td>∑ %</td>
</tr>
<tr>
<td>Identify the family health problem</td>
<td>1</td>
<td>4,8</td>
<td>17</td>
<td>81</td>
<td>3</td>
</tr>
<tr>
<td>Make decisions</td>
<td>3</td>
<td>14,3</td>
<td>4</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>Caring for the family member</td>
<td>11</td>
<td>52,4</td>
<td>8</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Modify the conducive environment</td>
<td>5</td>
<td>24</td>
<td>2</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Utilize the health services</td>
<td>6</td>
<td>28,6</td>
<td>2</td>
<td>9</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 6: Distribution of family ability

<table>
<thead>
<tr>
<th>Family Burden</th>
<th>Category</th>
<th>Family Ability</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Good</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>∑ %</td>
<td>∑ %</td>
</tr>
<tr>
<td>Low</td>
<td>8</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Mild</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>High</td>
<td>1</td>
<td>4,8</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>42,8</td>
<td>10</td>
</tr>
</tbody>
</table>

Spearman’s Rho p = 0,008

The statistical test shows that there is a relationship between family burden with family ability with a medium relationship level (p = 0,008, r = 0.561). A high burden that is felt by the family will decrease the ability of the families to care for patients with schizophrenia.

Discussion

Family Burden in Caring for Schizophrenia Patients:
The families experience burden when treating patients with schizophrenia. The family burden is the impact of the illness on the family members affecting their emotional stress. The burden is felt when a
The family ability to modify the healthy environment is still felt as being less. Maintaining a comfortable home can be done by building good communication and providing support in various situations. The results show that both the patients and their families experience social stigma. The families do not always address the stigma well; the family can project shame and anger towards the patients with schizophrenia. The conducive environment referring more to emotional expression is an indicator of the quality of the emotional environment for schizophrenic patients. The families show a high emotional expression. The family difficulties in modifying the environment can be affected by the time spent treating patients with schizophrenia. The long duration of care makes some families feel saturated and tend toward high emotional expression. The family must create an acceptance for a patient’s condition, including

Family Ability in Taking Care of the Schizophrenia Patient: The family ability to provide care consists of five family health tasks. The family must be able to perform the patient’s Activity Daily Living, instrumental Activity Daily Living (iADL) and psychosocial needs. The family should be trying to keep the patients engaged with their regular medication and consultations with the health services, they can treat the patients in recurrence and when meeting all patient daily needs. The results showed that 81% of families were able to recognize the health problems. This means that the families understand the causes, symptoms, treatment and consequences of schizophrenia which strongly supports the families in caring for and meeting the needs of their patients every day.

The results showed that 66.7% of the family have less of an ability to make the decision to take appropriate action and to modify the healthy family environment. Appropriate decisions begin with the family foresight in terms of observing the signs and symptoms that occur in patients, including immediately seeking the right information and to decide what actions are to be taken by the family. The results show that most families bring the patient to a shaman before professional health services. They do not allow the patients to leave the home, separating the patients from society or placing them in a special room not far from home. The family is the most important in solving problems through the family decisions based on the shared rights and responsibilities that ultimately determine the service that is to be used. The family decision to bring the patients to a shaman is influenced by the family understanding of the causes of schizophrenia, and if they are related to the spiritual aspect of life, such as involving spirits and witches.

The subjective burden is described as the psychological reaction of the family members. The subjective burden felt by the family during the treatment of schizophrenia is expressed as a feeling of sadness, confusion, anxiety, suffering and embarrassment due to the unnatural behavior shown by the patient, such as being angry without a cause, and refusing to eat, drink and take a bath for a long time. Families tend to have protective feelings as well as feeling shame from their neighborhood and surroundings. The families are more likely to hide the patients. Psychological burden is also felt as a mind burden. This burden is caused by a family that is concerned about the future of their patient. Schizophrenia patient families are always thinking about the many problems caused by unusual patient behavior. The family should have sufficient resources to survive life with the patients. The mind burden felt by the family affects them psychologically, as the family is the primary caregiver of schizophrenia patients.

The family also experiences an objective burden. This can be explained as a burden associated with the care given by the family. Based on Table 4, the high objective burden of the family is in the form of physical burden, financial burden and social burden. The physical burden creates a negative impact on the physical health of the family. They feel physically exhausted because they have to stay up with the patient every night causing less rest, while in the daylight, they must keep working and move. The financial burden was also felt by almost 57% of families, includes the number of costs incurred to meet the needs of the patients such as medical expenses, day-to-day expenses, hospital transportation and hospitalization costs. The majority of families (48%) are employees who work, so they often have to leave a job that results in reduced revenue. The social burden felt by the family related to constraints of the number of activities and time means that the family cannot spend their time elsewhere because they must always take care of the schizophrenic patient. The community are also keeps a distance from the family and patient. They were refuse the existence of the patients and their families in the neighborhood.
respecting and cultivating an attitude of responsibility toward the patient so then they does not lose their role in the family.

**Relationship between Family Burden with the Family Ability to Care for Schizophrenic Patients:**
The research findings showed that the subjective burden is higher than the objective burden. Families who have a burden may not be able to treat the patients well. Subjective burden has an impact on the lack of family ability to make decisions to determine the appropriate actions, to make modifications to a healthy family environment and to support the patient’s recovery process. Families with a high subjective burden will find it difficult to modify the family environment. Psychologically, the family cannot control their emotions because of the unusual patient behavior; they become increasingly depressed and give continuous criticism to the patient with schizophrenia. Family with a high emotional expression will not solve the problem and this causes a recurrence in the patient. Families need help to lower the subjective burden, both psychologically and in their mind.

**Conclusion**
Families who treat patients with schizophrenia feel a higher subjective than objective burden. The subjective burden will decrease the ability of the family to care for the patient with schizophrenia, especially when it comes to making decisions and modifying their environment. Nurses need to develop a family psychoeducation approach to help the families break down their perceived burden. This is so then they are able to perform their family care tasks.

**Ethical Clearance:** The ethical approval of this study was granted by the Faculty of Nursing, Airlangga University No. 245-KEPK, 2016

**Source of Funding:** Self-funding

**Conflict of Interest:** None

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Family Support Improves Hypertensive Patient Drug Compliance

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General Hospital, East Nusa Tenggara, Indonesia

ABSTRACT

Family support is one of the support types with the aim of achieving optimal blood pressure control for patients with high blood pressure. This study aimed to analyze the relationships between family support, adherence to taking medication and blood pressure control in patients with hypertension in the RSUD. Prof. Dr. W. Z. Johannes Kupang. The design of this study was descriptive correlational through a cross-sectional approach. The population was the hypertensive patients in the hospital of Prof. Dr. W. Z. Johannes Kupang. The sample consisted of 200 respondents recruited using simple random sampling. The independent variable was family support while the dependent variables were compliance with taking medication and blood pressure. The data was collected using a questionnaire and observation checklists. The data was analyzed using Spearman Rho with a significance level of α = 0.05. The results showed that there were relationships between family support and medication adherence (p = 0.000), adherence to taking medication and systolic blood pressure (p = 0.000) and medication compliance with diastolic blood pressure (p = 0.000). It can be concluded that family support correlates with the patients’ compliance when taking medication and blood pressure. Further research is recommended to examine the causes of poor medication adherence among patients with good family support.

Keywords: Family support, medication adherence, hypertensive patients, blood pressure

Introduction

Hypertension has a high prevalence rate in the population in general. Although there is extensive drug availability, only about 25% of hypertensive patients have controlled blood pressure.1 Hypertensive patients experience difficulties in adhering to antihypertensive treatment. Poor adherence to hypertension drugs not only results in uncontrolled blood pressure but it also becomes a major risk factor for other diseases, such as coronary heart disease, cerebral thrombosis, stroke and chronic kidney failure.2

The World Health Organization (WHO) records that 26.4% of people worldwide are suffering from hypertension. This is around 972 million people. This number is likely to increase to 29.2% in 2025.3 Of the 972 million people with hypertension, 333 million are in developed countries and 639 are in developing countries, including Indonesia.4 According to the National Health Indicator Survey (Circular) data, only 30% of hypertensive patients take antihypertensive medication. Hypertension ranks 5th in the most common diseases in NTT with 39,344 patients.5

Efforts have been made by RSUD.Prof.Dr.W.Z. Johannes Kupang-NTT through the doctors and nurses to enhance the patients’ compliance. However, this has yet to show optimal results. Adherence to treatment is very important in patient care because it can reduce recurrence and achieve controlled blood pressure.6 Non-adherence in taking hypertension medication can cause recurrence, resulting in an increase in the number of hypertensive patients who visit the hospital. Low adherence to antihypertensive drugs has also been observed among hypertensive patients, where more than half of them do not achieve controlled blood pressure, so giving in to

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the disease where their quality of life decreases. These studies mainly focused on hypertensive patients in urban areas. More information regarding prevalence and the correlated factors for medication adherence for rural patients with hypertension is needed to better control blood pressure and prevent hypertension-related complications. Methods The study was carried out in three township hospitals in Shanxi Province (Northern China). Family support has been proven to align positively with the health outcomes for various medical conditions, including patients who are in inpatient care in hospitals. Family support can be defined as the assistance and protection given to the family members.

Based on the description above, in this study, the researchers tried to explain the relationship of family support with adherence to taking medication in patients with hypertension who had experienced a relapse in the work area of the RSUD Prof. DR. W. Z. Johannes Kupang-NTT.

**Method**

This study used a descriptive correlational design through a cross-sectional approach. This research was carried out in the RSUD Prof. DR. W. Z. Johannes Kupang-NTT hospital in December 2018. The population consisted of 403 hypertensive patients. The sample was 200 hypertensive respondents recruited through simple random sampling. The independent variable was family support. The dependent variables were adherence to taking the medication and blood pressure. The data collection was carried out by the researchers through the use of a questionnaire and observation check lists. The data was then analyzed using Spearman Rho with a significance level of $\alpha = 0.05$.

**Results**

Table 1 describes the participants’ characteristics. It can be seen from Table 1 that the respondents with hypertension were mostly female (60.5%). Nearly half of the respondents were aged more than 65 years (33.5%), were mostly married (99.5%) and almost half had a secondary level of education (grades 10-12). They worked as entrepreneurs (37%) with their income mostly being less than Rp. 1,660,000 (60.0%).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n = 200</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>79</td>
<td>39.5</td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>60.5</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-45 years</td>
<td>42</td>
<td>21</td>
</tr>
<tr>
<td>46-55 years</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td>56-65 years</td>
<td>55</td>
<td>27.5</td>
</tr>
<tr>
<td>&gt;65 Years</td>
<td>67</td>
<td>33.5</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>38</td>
<td>19</td>
</tr>
<tr>
<td>Basic Education (grades 1-6)</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>Basic Education (grades 7-9)</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Secondary Education (grades 10-12)</td>
<td>82</td>
<td>41</td>
</tr>
<tr>
<td>higher education</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does Not Work</td>
<td>59</td>
<td>29.5</td>
</tr>
<tr>
<td>Labourer</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>74</td>
<td>37</td>
</tr>
<tr>
<td>Civil Servants</td>
<td>41</td>
<td>20.5</td>
</tr>
<tr>
<td>Etc</td>
<td>11</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; Rp. 1,660,000</td>
<td>121</td>
<td>60.6</td>
</tr>
<tr>
<td>&gt; Rp. 1,660,000</td>
<td>79</td>
<td>39.5</td>
</tr>
<tr>
<td><strong>marriage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>199</td>
<td>99.5</td>
</tr>
<tr>
<td>Single</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table 2 resumes the family characteristics. It was found that the majority of the patient’s family were female (66.5%), had a secondary level of education (57.5%), were entrepreneurs (56%) and were mostly aged 26 - 35 years (54.5%). Nearly all of the families were married (93%) and more than half (56%) were the patients’ offspring.

**Table 2: Family characteristics in RSUD. Prof. DR. W. Z. Johannes Kupang-NTT**

<table>
<thead>
<tr>
<th>Family characteristics</th>
<th>n = 200</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>67</td>
<td>33.5</td>
</tr>
<tr>
<td>Female</td>
<td>133</td>
<td>66.5</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Education (grades 1-6)</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Basic Education (grades 7-9)</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Secondary Education (grades 10-12)</td>
<td>115</td>
<td>57.5</td>
</tr>
<tr>
<td>higher education</td>
<td>70</td>
<td>35</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does Not Work</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>entrepreneur</td>
<td>112</td>
<td>56</td>
</tr>
<tr>
<td>Civil Servants/Army/Police</td>
<td>57</td>
<td>28.5</td>
</tr>
<tr>
<td>Retired</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 3 presents the relationship between family support and medication adherence among the patients with high blood pressure. As illustrated in Table 3, in general, the majority of the respondents (91%) received strong family support, strong emotional and appreciation support (94.5%), strong instrumental support (88%) and moderate information support (67%). As predicted, most individuals who received strong family support (53%) adhered to their hypertension medication regimens; adversely, individuals with weak family support showed poor adherence to taking the hypertension medication.

Table 3: Family support and medication adherence in RSUD. Prof.DR.W.Z. Johannes Kupang-NTT

<table>
<thead>
<tr>
<th>Family Support</th>
<th>General</th>
<th>Emotional appreciation</th>
<th>Instrumental</th>
<th>Information</th>
<th>Adherence to Taking the Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>Nonadherents</td>
</tr>
<tr>
<td>Weak</td>
<td>3 (1.5)</td>
<td>3 (1.5)</td>
<td>7 (3.5)</td>
<td>22 (11)</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Moderate</td>
<td>15 (7.5)</td>
<td>8 (4)</td>
<td>17 (8.5)</td>
<td>44 (22)</td>
<td>11 (5.5)</td>
</tr>
<tr>
<td>Strong</td>
<td>182 (91)</td>
<td>189 (94.5)</td>
<td>176 (88)</td>
<td>134 (67)</td>
<td>76 (38)</td>
</tr>
</tbody>
</table>

n = 200, Spearman Rho, p: 0.000, r: 0.295

The statistical analysis using the Spearman Rho showed a significance correlation (p = 0.000) with a coefficient correlation of r = 0.295; there was a relationship between family support and medication compliance in hypertensive patients with a sufficient correlation and positive direction. This implies that the higher the family support, the higher someone’s obedience to taking the medicine.

Table 4: Drug compliance in hypertensive respondents in RSUD. Prof.DR. W.Z. Johannes Kupang-NTT

<table>
<thead>
<tr>
<th>Adherence to taking medicine</th>
<th>Drug compliance (n = 200)</th>
<th>Stop/reduce medication with reasons (n = 200)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Forget (%)</td>
<td>Deliberately skip (%)</td>
</tr>
<tr>
<td>Non-adherent</td>
<td>44.5%</td>
<td>41.5</td>
</tr>
<tr>
<td>Adherent</td>
<td>55.5%</td>
<td>58.5</td>
</tr>
</tbody>
</table>

Table 4 summarises the drug compliance among the respondents. It is revealed that the level of adherence of the respondents concerning taking their medication was mostly obedient (55.5%) and that more than half of the respondents never forgot to take their medication (58.5%), nor did they deliberately skip their medication either (71%). Nevertheless, some respondents said that they stopped/reduced their medication for varied reasons: felt worse (69.5%), disturbed by the obligation (65.5%) and experienced some difficulties when taking the medication (65.5%). The bigger proportion of respondents complied with taking the medication although when they were travelling (57.5%) and felt healthy (66%).

Table 5 shows the relationship between medication adherence and blood pressure. As can be seen from Table 5, most hypertensive patients obeyed when it came to taking their medication (55.5%). Additionally, among the patients who adhered to taking their medicine, most of them showed normal both systolic (47.5%) and diastolic (39%) blood pressure. Adversely, a small percentage of patients with poor adherence showed a mild increase in diastolic blood pressure (19.5%).
The Spearman Rho analysis showed there to be a significant relationship between medication adherence and systolic blood pressure (p= 0,000) with a coefficient correlation of r = -0.536. This shows a strong relationship between medication adherence and systolic blood pressure with the direction of the relationship being negative; the higher compliance with hypertensive medication, the lower the systolic blood pressure.

### Table 5: Relationship between medication adherence and blood pressure in RSUD. Prof.DR.W.Z. Johannes Kupang-NTT

<table>
<thead>
<tr>
<th>Adherents Take Medicine</th>
<th>Systolic Blood Pressure</th>
<th></th>
<th>Diastolic Blood Pressure</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Mild</td>
<td>Medi-um</td>
<td>Normal</td>
<td>Mild</td>
</tr>
<tr>
<td>Nonadhe-rents</td>
<td>34</td>
<td>17</td>
<td>23</td>
<td>11.5</td>
<td>32</td>
</tr>
<tr>
<td>Adherents</td>
<td>95</td>
<td>47.5</td>
<td>12</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
<td>64.5</td>
<td>35</td>
<td>17.5</td>
<td>36</td>
</tr>
</tbody>
</table>

Spearman Rho, p : 0,000, r : - 0.536

Furthermore, the Spearman Rho statistical test showed there to be a significant correlation between adherence and diastolic blood pressure (p = 0,000) with a sufficient coefficient correlation (r = - 0.298). Thus it can be concluded that there was a sufficient relationship between medication adherence and diastolic blood pressure with a negative direction; the higher the patient’s compliance, the lower the diastolic blood pressure.

### Discussion

The study showed there to be a positive-direction-relationship between family support and the medication adherence of hypertensive patients; in other words, the higher the family support, the better the patient’s adherence to taking their medication. This supports the theory of the Health Belief Model by Rosenstock, which states that family support plays a role as an external factor that influences the respondents to taking treatment actions.13 Family supports includes emotional, appreciation and the instrumental and information support that will have an impact on compliance. Good family support provided by the family members to the patients can help with the healing process.10

This study revealed that in Kupang, Indonesia, almost all of the respondents received strong emotional and appreciation family support, where the family always accompanies, loves and cares for the family members during their treatment. This form of support makes the individuals feel comfortable, confident, felt accepted, loved, secure and content.14 These forms of support are very important because hypertensive patients need both emotional support and sufficient appreciation so then the patients feel loved and keep up the treatment.

Additionally, this study found that a small proportion of respondents received weak instrumental support such as finance and the facilities that they need. This lack of support was related to having a low income. This supports the previous research which concluded that a lack of instrumental support may cause non-compliance in treatment because the families are unable to provide for their treatment-related needs.15,16

This study found there to be a relationship between medication adherence in patients with hypertension and systolic blood pressure in a negative direction, where the better the adherence, the better the systolic blood pressure control achieved. This supports the existing literature which proves a relationship between adherence to taking antihypertensive drugs to blood pressure in hypertensive patients both systolic and diastolic blood pressure.7,17–19 these studies mainly focused on hypertensive patients in urban areas. More information regarding prevalence and the correlated factors for medication adherence for rural patients with hypertension is needed to better control blood pressure and prevent hypertension-related complications. Methods The study was carried out in three township hospitals in Shanxi Province (Northern China) The success of the patients in treating their hypertension greatly influences their controlled blood pressure. The success factors are related to the patient’s compliance in taking medication and family support.

In this study, most of the respondents continued to take their medication even when they felt healthy (no symptoms). The success of the treatment of hypertensive patients is influenced by the active role of the patient and his willingness to regularly see the doctor. There is also
their adherence to taking antihypertensive drugs. The respondents who did not stop taking their medication even when they felt healthy mostly had normal systolic blood pressure. This confirms the previous literature which found that adherence has a significant effect on decreasing systolic blood pressure.\textsuperscript{18,19}

Most respondents received good informational support. The family members provided the respondents with information, which in turn enhanced the respondents’ medication adherence. This finding supports another study that found the family support can strengthen each individual, increase self-respect, and that it has the potential to be the main prevention strategy for the whole family in facing the challenges of everyday life.\textsuperscript{11,17} Moreover, the research by Turan et al. concluded that the level of perceived support from the families was higher than the perceived level of support from friends or other individuals.\textsuperscript{17} These confirm the importance of enhancing family support for each hypertensive patient.

Moreover, the study showed there to be a relationship between medication compliance in patients with hypertension and diastolic blood pressure in a negative direction, where the higher the adherence to taking antihypertensive drugs, the lower the diastolic blood pressure. This confirms the findings of Ariyanto, which examined the relationship between compliance and blood pressure.\textsuperscript{20} These findings support the results of a study conducted by Márquez-Contreras et al., which concluded that adherence to treatment is very important in patient care. This is because it can reduce recurrence/recurrent hypertension and it is very necessary to achieve controlled blood pressure.\textsuperscript{19} Compliance in taking medicine is very important in achieving controlled systolic and diastolic blood pressure.

Almost all of the respondents with hypertension had never deliberately skipped their medication within the past 2 weeks. Compliance with medication is influenced by good family support. Family support is an effort given from the family members both morally and materially in the form of real motivation, advice, information and assistance.\textsuperscript{11} This affirms the research of Fajriyah et al. and Permatasari et al’s work, which found that adequate family support was associated with a decrease in mortality.\textsuperscript{11,12}

**Conclusion**

Family support has a relationship with compliance with the medication where the better the family support, the better the level of adherence of the patients with hypertension to taking hypertension medication. This will increase; the less the family support, the more that patient’s level of non-compliance will increase.

Compliance with taking medication has a relationship with systolic and diastolic blood pressure where the more obedient patients take antihypertensive drugs. Therefore the hypertensive patients will have more controlled systolic and diastolic blood pressure.

**Ethical Clearance:** This study was ethically approved by the IRB committee of the Faculty of Nursing Universitas Airlangga in 2018.

**Source of Funding:** None

**Conflict of Interest:** None

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The Relationship between Family Support and Self-esteem among Cervical Cancer Patients Undergoing Chemotherapy

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ABSTRACT

The main management of advanced cervical cancer is chemotherapy. The side effects of chemotherapy include changes in the patient’s biology and the psychological impact on the patient through a decline in self-esteem. The factor that can affect the self-esteem of cervical cancer patients undergoing chemotherapy includes family support. This study aims to determine the relationship between family support and self-esteem in cervical cancer patients undergoing chemotherapy. The design was an analytical correlation with a cross-sectional approach. The population in this study was patients with stage IIB cervical cancer which consisted of 47 respondents recruited using the purposive sampling technique. The data was collected by a questionnaire. The results showed that 59.6% had good family support and 59.6% had high self-esteem. This was analyzed using the Spearman rank test with a significance level of 5 (0.05). We obtained a correlation coefficient (r) between family support and patient self-esteem that was 0.982 with a p-value of p=0.000. This means that there was a very strong relationship, namely the better family support given to the cervical cancer patients undergoing chemotherapy, the higher the self-esteem of the cervical cancer patients undergoing chemotherapy at Dr. Soetomo General Hospital Surabaya. Family support is very necessary to give to the cervical cancer patients undergoing chemotherapy to improve the patient’s self-esteem in terms of accepting their condition.

Keywords: Family Support, Self-esteem, Cervical Cancer, Chemotherapy

Introduction

Women diagnosed with cancer face many challenges, starting from the beginning of the disease and through the treatment measures, late diagnosis, side effects of the medication, financial problems, and the possibility of facing other consequences such as physical and psychosocial effects, and to explore women’s needs and experiences of psychosocial support following end-of-treatment. Methods: Data were collected from 337 gynaecological cancer survivors, 19–39 years at diagnosis, using a study-specific questionnaire and the Swedish Quality Register of Gynaecologic Cancer. Predictors of distress were investigated with multivariable logistic regression analysis. Open-ended questions were analysed with content analysis. Results: The prevalence of cancer-related distress was 85% (n = 286)Cervical cancer is the growth of malignant cells located in the cervix.2,3 One of the management methods of cervical cancer treatment is chemotherapy.4 Hypnosis has been used for pain relief in metastatic patients but rarely for induction of anesthesia. Material and method Between January 2010 and October 2015, 300 patients from our Breast Clinic (Cliniques universitaires Saint-Luc, Université catholique de Louvain)The side effects of chemotherapy include changes in biology that affect changes in the patient’s psychology in turn. The biological changes that occur in the patients undergoing chemotherapy include nausea vomiting, hair loss, wrinkled skin, blackened nails, bleeding, weight loss, decreased appetite, the patients feeling very weak and tired, being easily bruised or bleeding, canker sores, swollen feet and pain.5,6

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Drastic biological changes mean that the sufferer experiences psychological changes such as expressing helplessness, feeling embarrassed, decreasing self-confidence, the fear of not being attractive anymore and the patient feeling like no one wants to accept his current condition, feeling grieving, being scared, confused, feeling that their families are not being fulfilled and feeling despair during the chemotherapy treatment.\(^7\) The biological and psychological changes that occur in the patients with cervical cancer who undergo chemotherapy have an impact on the sufferers’ self-esteem.\(^8\) The self-esteem referred to in patients with cervical cancer is an acceptance and rejection of himself against changes.\(^9\) According to the Family Support and Self-Esteem of Breast Cancer Patients study by H. Adam Malik Hospital Medan, individuals who have low self-esteem will show an attitude of rejection and they will always blame themselves. Conversely individuals who have high self-esteem will show acceptance and have a sense of trust self and enthusiasm when undergoing chemotherapy treatment.\(^11\)\(^,\)\(^12\)

The incidence rate of cervical cancer in Indonesia is 20,928 cases and the mortality rate is 9,928 people.\(^13\) The incidence rate of cervical cancer in Indonesia is \(< 19.92\%\) per 100,000 women per year. According to the study titled Cervical Cancer Screening and Prevention in Low-resource Settings, 64\% of patients with cervical cancer were at an advanced stage and 54\% of advanced cervical cancer patients underwent chemotherapy.\(^14\) 90\% of patients with cervical cancer who undergo chemotherapy will experience side effects such as nausea and vomiting, hair loss, wrinkled skin and decreased physical function. This can affect the patient’s psychology, so the changes that occur can affect the self-esteem of cervical cancer patients.\(^15\) Family support given at 93.4\% can increase the self-esteem of cervical cancer patients who undergo chemotherapy by 60\%.\(^10\)

Based on the preliminary study data from the Obsgyn Ward in Dr. Soetomo General Hospital, it was found that the number of patients with cervical cancer on January 1\(^{st}\), 2017 through to December 12\(^{th}\), 2017 was 1,185 people with cervical cancer. The number of cervical cancer patients who underwent chemotherapy treatment totaled 627 patients with cervical cancer. In the initial survey of 8 people with cervical cancer who underwent chemotherapy, it was found that 6 people with low self-esteem categories showed a response to feelings of shame, the fear of not being attractive anymore, feeling insignificant, not being confident and being unable to meet the needs of their child and her husband because of the side effects of chemotherapy treatment. There were 2 people with either high and moderate self-esteem categories who showed a feeling of enthusiasm and who were able to accept the self-changes that occurred due to the chemotherapy treatment.

The support provided by the family will help people with cervical cancer become enthusiastic about undergoing chemotherapy treatment. This can increase the patient’s confidence in the changes after chemotherapy. High self-esteem can affect the self-esteem of cervical cancer patients and this can help to accelerate their healing process.\(^5\)

**Method**

The methodology of this research was a correlation analytica study with a cross-sectional approach. The population in this study consisted of cervical cancer patients who had underwent chemotherapy in Dr. Soetomo General Hospital Surabaya from October to December 2017, amounting to 54 patients via a purposive sampling technique that gathered 47 respondents. In this study, the data analysis technique used the Spearman Rank Statistical Test with SPSS Version 16.0. The instruments in the study were a family support questionnaires including instrumental support, award support, instrumental support, emotional support and a Rosenberg questionnaire self-esteem scale that had been modified.\(^10\) The validity test of this questionnaire used SPSS version 16.0 with a large r table that was determined according to the number of respondents who tested with a significance level of 5\% (0.05), which was 0.4438. The instrument items were considered to be valid or relevant if the r count > r table was specified.

The results of the first validity test on the family support questionnaire obtained the value of the r count as 0.881. The minimum r count value in the questionnaire was 0.559. It can be concluded that there were no invalid questions. The results of the second validity test, namely on the questionnaire, obtained an r count value of r count of 0.857. The minimum r value calculated was 0.544. The reliability test of the questionnaire was carried out using Cronbach’s alpha method 0 to 1 with the results of the reliability test on the first questionnaire, namely about family support being 0.771. This means that the
questions within the questionnaire were declared to be reliable. The results of the second reliability test on the self-esteem questionnaire also showed that Cronbach’s alpha was 0.768. The questions in the questionnaire were therefore declared to be reliable. To ensure that this study was safe for all participants, the participants had the purpose of the study explained to them. Informed consent was obtained prior to the study beginning. Confidentiality and anonymity were maintained throughout the study. The participants were informed that they could stop at any time without discrimination during the study.

Results

Based on the results of the data analysis above, the relationship between family support and the dignity of the cervical cancer patients undergoing chemotherapy in Dr. Soetomo General Hospital Surabaya showed that good family support will increase the patient’s self-esteem. This was found in 28 respondents. Sufficient family support or less will moderate the patient’s self-esteem; this was found for 19 respondents. The results showed that the correlation coefficient (r) between family support and the self-esteem of cervical cancer patients undergoing chemotherapy was (r) 0.982 with a significance level (p) = 0.000 < 0.05 (Table 1).

Table 1: The Relationship between Family Support and Self-Esteem among Cervical Cancer Patients with Chemotherapy (n = 47)

<table>
<thead>
<tr>
<th>No.</th>
<th>Family Support</th>
<th>Self Esteem</th>
<th>Total</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>Moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Good</td>
<td>28</td>
<td>0</td>
<td>28</td>
<td>0.982</td>
</tr>
<tr>
<td>2</td>
<td>Enough</td>
<td>0</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Less</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

For the family support for the cervical cancer patients, most of the respondents received family assistance (28 respondents, 59.6%), as many as 16 respondents received sufficient family support (34.0%) and the remaining 3 respondents (6.4%) received less family support. The results of this study are supported by the factors associated with the behavior of the prevention of cervical cancer in women of childbearing age. The existence of high family support will make the patients feel more calm and comfortable when they are undergoing chemotherapy. Good family support is seen when families, like their relatives, children and loved ones, are seen accompanying the cervical cancer patients while they are undergoing chemotherapy at the hospital. This is supported by the research into cancer of the cervix uteri, in that the existence of positive support from the family will make the patients enthusiastic and committed to undergoing chemotherapy. In addition, good family support in assisting the patients will make patients stronger at fighting the disease and they will accept their physical condition as a result of the chemotherapy treatment that they are undergoing. Good family support given to the family members who are in the stage of adaptation to disease or recovery can affect the success of the healing process. This is supported by the role of the family in providing support related to the achievement of self-integrity post-radical mastectomy for breast cancer patients. Related to the experience of women after undergoing cervical cancer therapy, the good family support given to cervical cancer patients undergoing chemotherapy are: 1) meeting their basic needs including appropriate food and drink, and facilitating the patient’s head covering to cover the parts of their hair that fall out due to chemotherapy; 2) the family motivates and advises the patients not to despair when undergoing treatment and they pray for their recovery; 3) the families must always give their enthusiasm, love, empathy and attention to patients by assisting or waiting for the patients during chemotherapy treatment and 4) families provide information and remind the patients of their chemotherapy treatment schedule.

High self-esteem is influenced by the feelings of being accepted, loved, and respected by others. Individuals also have experience related to the success that has been achieved in their lives. Self-esteem comes from two sources, namely from the self and others. The first aspect of self-esteem is to be loved and to get respect from others. Their self-esteem will increase if someone gets love and motivation from others. High self-esteem is shown when the patients feel capable and confident in doing all of their daily activities, accepting their condition sincerely, not blaming themselves or others and feeling respected and valued despite suffering due to the side effects of the chemotherapy treatment.

The results showed that the correlation coefficient (r) between family support and the self-esteem of cervical cancer patients undergoing chemotherapy was (r) 0.982
with a significance level \( p = 0.000 \geq 0.05 \). The results of this study are supported by the results of Family Support and Self-Esteem of Breast Cancer Patients in H. Adam Malik Hospital Medan’s study, in that there is a significant relationship between family support and self-esteem. The higher the family support given to the cervical cancer patients undergoing chemotherapy, the higher the self-esteem of the cervical cancer patients will be because the family has a very important role in forming one’s self-esteem.\(^9\) The results of this study reinforce the previous research, in that there is a close relationship between the two variables. Cervical cancer patients undergoing chemotherapy in the Dr. Soetomo General Hospital mostly have high self-esteem. This means that cervical cancer patients have a high assessment and acceptance of themselves. This happens because most cervical cancer patients get good support from the family through the support of information, appreciation, emotional and instruments. This is vice versa in cervical cancer patients who have moderate self-esteem due to the support obtained from weak and moderate families.

Families have an important role, which is focused on being supportive during the healing and recovery process of their family members, so then they can achieve optimal health status.\(^20\,21\) and to explore women’s needs and experiences of psychosocial support following end-of-treatment. Methods: Data were collected from 337 gynaecological cancer survivors, 19–39 years at diagnosis, using a study-specific questionnaire and the Swedish Quality Register of Gynaecologic Cancer. Predictors of distress were investigated with multivariable logistic regression analysis. Open-ended questions were analysed with content analysis. Results: The prevalence of cancer-related distress was 85% \( n = 286 \)\(^3\) In addition, the family can help someone to accept their current environment or circumstances. They can help the patient with their care process where the family strives to provide support. They can increase the spirit of life and commitment of the patients who are to undergo chemotherapy treatment.\(^22\)

Self-esteem is influenced by two things, namely how the individuals value themselves in the various aspects of their lives and how much social support they get from others.\(^9\) Lack of support from their loved ones will affect a person’s self-esteem. Inadequate family support in cervical cancer patients can cause the pessimistic patients to not undergo the chemotherapy which comes with various side-effects that must be experienced. The patients will thus despair and not undergo chemotherapy according to the schedule determined by the doctor.\(^22\) Family support that is given well through instrumental, rewarding, emotional and information support for the cervical cancer patients who undergo chemotherapy can affect the patients’ self-esteem by fostering self-confidence, giving them a high self-assessment and increasing the patient’s motivation to recover.\(^23\)

**Conclusion**

The family support provided for cervical cancer patients who are undergoing chemotherapy in Dr. Soetomo General Hospital Surabaya was mostly good. The self-esteem in the cervical cancer patients undergoing chemotherapy in Dr. Soetomo General Hospital Surabaya was mostly high. The family support was related to the self-esteem of the cervical cancer patients undergoing chemotherapy treatment in Dr. Soetomo General Hospital Surabaya.

**Ethical Clearance:** The ethical procedures were conducted based on ethical clearance no 0313/KEPK/V/2018.

**Source of Funding:** There was no external funding support for this research and the author used self-funding to conduct the research.

**Conflict of Interest:** The authors declare that they had no conflicts of interest or financial interests in the preparation of this article.

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Counseling Improves Parental Attitudes for Prevention of Dengue Hemorrhagic Fever (DHF) Shock in Tropical Coastal Area

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¹Faculty of Health Science, Universitas Gresik, Gresik, Indonesia; ²Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Dengue Hemorrhagic Fever (DHF) can result in shock complication which eventually lead to death. Family knowledge and attitudes are essential to prevent shock from dengue fever. The provision of education in the form of health education about dengue shock which is self-care strategies for optimizing metabolic control and prevent complications. The purpose of this study was to determine effect of health education toward knowledge and attitude parents for prevention of DHF shock. The research design used was Pre-experimental with one-group pre-post-test design. The population in this study were all parents who have children with DHF. A sample of 20 parents was recruited by a consecutive sampling technique. The variables were measured using a questionnaire and observation sheet. Data analysis was done by a Wilcoxon Signed Rank Test and McNemar Test. The results showed there were increased knowledge and attitudes. Statistical analysis obtained value ρ = 0.000 means there were the influence health education of dengue shock to the knowledge and attitude parents of children with dengue hemorrhagic fever. It can be concluded that counselling improves parental attitudes for prevention of DHF shock.

Keywords: Health Education; Parents; Knowledge; Attitude; Dengue Hemorrhagic Fever.

Introduction

Dengue Hemorrhagic Fever (DHF) is a disease caused by dengue virus that is transmitted from person to person through the bite of the Aedes Aegypti mosquito.¹ Signs and symptoms of DHF patients include high fever 4-7 days, headache, muscle pain, joint pain, and bleeding under the skin.² Management with rehydration, antipyretics, and bed rest for DHF patients is adequate because it is self-limited.³ Handling late DHF can lead to dangerous complications.

Dengue Hemorrhagic Fever to date is one of the public health problems in Indonesia that tends to increase the spread and the number of patients. In the last 25 years, hyperendemicity DHF globally has centered in urban tropical areas.⁴ In East Java in 2015 there were 19,942 cases of which 1.4% died.⁵ The death of Dengue Hemorrhagic Fever patients is possibly due to late handling and dengue shock.⁶ This situation can be seen in the report of the incidence of dengue shock in one of the hospitals in Gresik, within three years the average of 34.7% of all cases of DHF.⁷

Signs and symptom of dengue shock are: weak, cold skin, wet skin, restless patients, rapid and weak pulse, blood pressure decreases.⁸ Parents’ knowledge of Dengue Hemorrhagic shock is still lacking where parents do not know what measures should be taken in preventing dengue shock in children. A 2-week survey in the Children’s Room of Muhammadiyah Gresik Hospital found 88.2% of parents to be less knowledge about the meaning of DHF, and the signs and symptom of dengue shock.⁷ Knowledge and parental attitudes are very influential in the attainment of health education.⁹ Nurses as a health worker have a role and responsibility in providing health education, according to the duty of a nurse as educator in giving information.¹⁰ The Muhammadiyah Gresik Hospital Children’s Room only provides information about DHF, but is not specific about
DHF shock. The problem statement in this study was to study the explanation of the influence of counseling on DHF shock on the knowledge and attitude parents of children with dengue fever.

**Method**

**Study Design, Setting, and Sampling:** The research design used pre-experiment with one-group design pre-post-test design. This design was to analyze the knowledge and attitude of parents before and after getting counseling in the prevention of dengue hemorrhagic fever shock.

The population in this study was parents of children patient with DHF in Gresik hospital in tropical coastal areas. A sample of 20 parents of children with DHF was recruited by consecutive sampling technique. Data collection was adjusted to the criteria of the parents can read, write, and their children do not have complications. Data were collected for seven weeks from October to November 2016.

**Study Variables:** The independent variable of this research is health education about prevention of dengue shock. The dependent variable of this study is the knowledge and attitudes of parents in preventing dengue shock. In this study, samples were taken according to the inclusion criteria and exclusion criteria. Health education variables regarding prevention of dengue shock include:

1. Definition of shock
2. Signs and symptoms of shock
3. Complications of shock
4. DB shock prevention

Variable knowledge of parents in the prevention of dengue shock assessed is:

1. Knowing the definition of dengue shock
2. Signs and symptoms of dengue shock
3. Complications from dengue shock
4. How to prevent dengue shock

The variable attitude of parents in preventing dengue shock consists of:

1. Response about the definition of dengue shock
2. Signs and symptoms of dengue shock
3. Complications of dengue shock
4. Prevention of dengue shock

Instruments of knowledge and attitude were assessed with a standard questionnaire which tested as valid and reliable. Counseling instruments were carried out with extension units (SAP) and leaflets. Each subject was conducted pre-counseling data of knowledge and attitude, then counseling for 15-20 minutes every day for three days. Data of knowledge and attitude were obtained after getting counseling on day 4.

**Data Analysis:** Descriptive statistics method was employed to analyze the data to generate the study results in forms of frequencies, and percentages. Inferential data were analyzed with Wilcoxon Signed Ranks Test and McNemar Test with significance $\alpha \leq 0.005$.

**Results**

The results of data collection indicate the characteristics of research subjects as presented in Table 1. The subjects of the study showed that the patient’s gender was mostly female. Age of the subjects included in the productive age ranged from 26-45 years. The subject’s education was almost entirely at the senior high school level.

Table 2 shows the research results of respondents’ knowledge before being given counseling intervention on DHF shock, mostly sufficient knowledge (60%). After getting intervention, respondents’ knowledge was almost entirely classified as good knowledge (90%). The result of Wilcoxon Signed Rank Test statistics shows that $\rho = 0.000$, which means there is influence of counseling about the shock of DHF on the knowledge of the parents in Marwah Children’s Room Muhammadiyah Gresik Hospital. The respondents’ attitudes before being given counseling about DBD shock were mostly negative (70%). After obtaining counseling intervention, respondents’ attitudes were mostly positive (70%). A small element of respondents’ attitude was still found to be a negative attitude, 30%. Result of the McNemar Test showed $\rho = 0.000$, which means there is influence of counseling about shock of DHF to attitude of parents in Marwah Children’s Room Muhammadiyah Gresik Hospital.
Table 1: Sample Characteristics (N = 20)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>80</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-25 years old</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>26-45 years old</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior high school</td>
<td>13</td>
<td>65</td>
</tr>
<tr>
<td>College</td>
<td>7</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 2: Statistical results of knowledge and attitude of parents for prevention of DHF shock (N = 20)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Before intervention</th>
<th>After intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Sufficient</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Less</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Wilcoxon Signed Rank Test</td>
<td>p = 0.000</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Negative</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td>McNemar Test</td>
<td>p = 0.000</td>
<td></td>
</tr>
</tbody>
</table>

Discussions

Knowledge of DHF Shock: The results showed that counseling about DHF shock had an effect on the increase of parents’ knowledge of the child. These results are in accordance with previous research that the increasing knowledge of parents will affect the incidence of DHF shock. The results are reinforced by the theory that counseling is an effective method to instill knowledge and motivation.

Another factor that can increase the knowledge of parents of children about DHF shock is possibly the characteristics of respondents. This result is consistent with the theory that knowledge is influenced by education, experience, age, occupation, income, and information. Characteristics of the subjects, including the age of patients, are included in the productive age which greatly affects the mindset and the process of acceptance. This situation is in accordance with the theory that the adult age of individuals can make self-adjustment independently of social life, being able to decide the problem rationally, and, thus, stable and mature emotionally. This condition shows a person can decide rationally about the importance of understanding DHF shock for himself.

The next characteristic is the level of subject education above the basic education. The published theories suggest that the more educated one becomes, the easier the person is to receive information. This condition shows that a person’s higher education will tend to get information, and the more information that goes in, the more knowledge gained.

Attitude to DHF Shock: Results of research on the counseling of DHF shock can improve the attitude of parents of children in preventing the occurrence of shock. This result is in accordance with previous research that health promotion improves parental attitudes in preventing dengue fever. This result is in line with previous theories which show that attitudes are a form of evaluation or reaction of feelings, whereby something that we have been experiencing is shaping and influencing our appreciation of the stimulus. This condition explains that the response will be one of the foundations of the formation of attitudes, to be able to have a response and appreciation one must have experience related to psychological objects.

Respondents who are waiting for and receiving DHF shock prevention counseling can increase awareness of the importance of holistic distraction prevention of dengue fever. Awareness is the attractiveness (Interest) of respondents in applying the intervention of DHF shock counseling through various considerations (Evaluation). Interest becomes the motivation to try (Trial) and implement (Adoption) prevention intervention of DHF shock as a whole. Increased knowledge of respondents makes the basis of increasing attitudes, because attitudes are the embodiment of knowledge received by respondents caused by infection of dengue virus transmitted by the female Aedes mosquito. This is the second leading cause of deaths in Champasack Province, where Pakse district has the highest number of this outbreak. This cross-sectional study was designed to assess the knowledge, attitude, and practice of people regarding dengue disease.
in 9 villages of the Pakse district from July to September 2006. Purposive sampling was done to collect data from 230 subjects. They had a fair knowledge about the vector (70.9% A good understanding of the handling of shock DHF makes respondents positive, because of the supporting, characteristics of respondents, such as age, and education.

The results also indicate that there are still respondents who have negative attitude after obtaining counseling. This result is possible because there are respondents who entered early adulthood, so like to make adjustments independently, and demand rationalization. This condition indicates that the emergence of attitude is based on the evaluation process in individuals who give conclusions on the stimulus in the form of positive or negative. This condition supports that parents who are given counseling should be given in-depth knowledge. The result of knowledge research is still found by respondents whose knowledge is sufficient, so there is a possibility that his attitude is still negative, and major outbreaks occurred in 2006 and 2010. However, no data on the local knowledge, attitude and practice (KAP) This knowledge will form the trust, so that it becomes the basis of one’s attitude toward a particular object.

**Conclusion**

Prevention of DHF shock can be achieved through health education interventions in the form of counseling. Counseling on the prevention of DHF shock can improve the cognition and affection aspects (knowledge and attitude) of parents of dengue fever in doing self-care and prevention.

The nurse as an educator should be active in providing counseling to patients and parents about the signs, symptoms, and impact of DHF Shock. Researchers are then expected to develop counseling by adding online media in counseling as a form of innovation in educational activities.

**Ethical Clearance:** The ethical approval for this study was granted by the IRB committee of the Faculty of Health Science at the Universitas Gresik in 2016.

**Source of Funding:** Self.

**Conflict of Interest:** None

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12. Kusumawardani E, Arkaesi N, Hardian. Effect of Health Counseling on Knowledge Level, Attitudes


Health Status Condition on Children with Leukemia Through Family Centered Empowerment Model

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ABSTRACT

Family-centered empowerment (FACE) is a nursing intervention by increasing family filial values, which consist of responsibility, respect, and family care. The objective of the study applied a family-centered empowerment model (FACE) to the health status of children suffering from leukemia. The study used quasi-experiment design, with the sample being 30 families with children suffering from leukemia treated in Soetomo Hospital Surabaya. Independent variable is family-centered empowerment (FACE) model and the dependent variable is health status condition of children suffering from leukemia. There is influence of FACE model to health indicator of children suffering from leukemia, consisting of child weight p = 0.000 (<0.05), leukocyte p = 0.002 (<0.05), and bleeding incidence p = 0.041 (<0.05). The Family Centered Empowerment (FACE) model is applied to families with children suffering from leukemia by nurses as an intervention of family filial value enhancement in increasing responsibility, respect and care so that families can develop their family appraisal skills to provide the best care while facing the challenge of treating children with leukemia. The family-centered empowerment model can improve family ability in treating children with leukemia, which impacts on child health indicator.

Keyword: Family, Empowerment, leukemia, children

Introduction

Leukemia is a blood cell malignancy originating from the bone marrow, characterized by the proliferation of white blood cells, with manifestations of the addition of abnormal cells in peripheral blood. The rapid change in symptoms in patients with leukemia causes children to feel great pain.¹ Children who suffer from leukemia really need serious attention for a long time, commitment, and it is a hard struggle for family members who care for them.² Caregivers or families who have children with chronic conditions are faced with demands, challenges, emotional and cognitive problems, and changes in roles in family and society. This has an impact on family sustainability in providing care for children, especially in the maintenance phase of the treatment of acute lymphoblastic leukemia (ALL). One of them is family disobedience in following the treatment process set by the doctor. Families of children with chronic disease conditions often feel helpless in meeting their children’s healthcare needs and in sustaining their family life. The helplessness experienced by the family will affect their ability to support providing care for their children. This has an impact on the health status of children suffering from leukemia.

Therefore, an intervention is needed to empower families in caring for children suffering from chronic diseases.³ The family’s ability to care for children with leukemia is very necessary to improve their quality of life and, as such, nursing interventions in an effort to improve the family’s ability to care for sick children are very important. Cancer in children has become a global problem because its incidence continues to increase, especially in developing countries. In Pakistan, 60% of children die of cancer. The 2013 Basic Health Research (Riskesdas) showed the Special Region of Yogyakarta (DIY) was the region with the highest prevalence of cancer patients in Indonesia for all ages based on a doctor’s diagnosis of 4-5 per 1,000 residents.⁴

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Based on the estimated number of cancer patients, Central Java and East Java Province are the provinces with the highest estimate of cancer patients, which is around 68,638 and 61,230 people, respectively. The average cancer prevalence in Indonesia is 1.4 per 1.00 population. Based on the register of the Division of Hematology & Oncology, SMF, Pediatric Dr. Soetomo Surabaya obtained data that, in 2016, there were 252 new cases of children diagnosed with cancer, the most number being Acute Lymphoblastic Leukemia (ALL) with 108 new cases.

Family empowerment is an intervention that nurses can use to help families. The expected results in families with such empowerment are the ability to cooperate with health professionals, minimize the effects of chronic conditions on children and siblings, restructure family roles and responsibilities, satisfy children’s healthcare needs, and reduce healthcare use and costs, so that, in the end it is expected to increase the health status of children with leukemia.

**Method**

**Study Design, Setting, and Sampling:** This study uses a quasi-experiment design. The sample used in this study was 30 mothers with children suffering from leukemia who were treated at the Children’s IRNA Dr. Soetomo Surabaya Indonesia, which was divided into two groups, namely 15 treatment group respondents and 15 control group respondents. The independent variable in this study is the Family Centered Empowerment (FACE) module and the dependent variable in this study is the family’s ability to treat leukemic children and the condition of the health status of children with leukemia. Indicators in family capacity measured were perceived health, personal growth, and existential wellbeing, while the children’s health indicators measured were nutritional status, secondary infection incidence, and bleeding events. Data were analyzed using parametric pair T-test and independent t-test.

**Result**

In the treatment group, the average value after treatment was higher than before treatment, even though the increase had not reached 10% of the average value before treatment (Table 1). The results of statistical tests showed a significant difference between family abilities before and after treatment. The highest difference is the personal growth indicator, which is the mother’s perception of her condition and which includes the development of positive life skills, and realistic and healthy self-development. These results indicate that the FACE module can improve the family’s ability to care for leukemic children, especially the ability of the family, in this case the mother’s ability to manage desired expectations, and planning actions to help achieve goals.
while caring for leukemic children. In the control group, it can be explained that the average value before and after also increases with the average increase smaller than the treatment group. Based on statistical tests, it was found that there were no differences in family abilities in treating leukemic children in the control group. Based on the results of statistical tests of differences between the treatment group and the control group, there was a difference in the average value of the family’s ability to treat leukemic children. The average value of the family’s ability to treat leukemic children in the treatment group was higher compared to the control group. This shows that the application of the FACE module can improve the family’s ability to care for leukemic children, which includes perceived family ability (personal health), personal growth and existence for prosperous conditions (Existential wellbeing).

The average value of health indicators of children suffering from leukemia, in this case BB, leukocyte value, and the occurrence of bleeding, in the treatment group shows an increase in health indicators, namely the average value of child BB increases, the average value of leukocytes in the normal range, and the frequency of bleeding; on average, there is a rare bleeding category (Table 2). Statistical tests show that there are significant differences between the indicators of children’s health before treatment and after treatment. This shows that the application of the FACE module to the family can improve the health indicators of children with leukemia.

In the control group, it can also be explained that there was a change in the average value of health indicators for children suffering from leukemia, but the change in the average value in the control group was lower than that of the treatment group. The results of statistical tests show that there are differences in the health indicators of children with leukemia on leukocyte values, and there is no difference in the indicators of body weight and the frequency of bleeding.

Based on the statistical analysis of the differences between the health indicators of children with leukemia in the treatment group and the control group, it was explained that there was no difference between the indicators of health of leukemic children in the treatment and control groups. It can be explained that the administration of the FACE module in the treatment group can improve the health indicators of children suffering from leukemia, especially in increasing body weight and decreasing the frequency of bleeding.

Table 1: Pre-Post Values of Family Ability to Take Care of Leukemic Children in IRNA Child Hospital Dr. Soetomo Surabaya

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Mean ± SD treatment</th>
<th>Mean ± SD control</th>
<th>Different test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>p</td>
</tr>
<tr>
<td>1.</td>
<td>Perceived health</td>
<td>30.73 ± 3.92</td>
<td>33.60 ± 2.197</td>
<td>0.004</td>
</tr>
<tr>
<td>2.</td>
<td>Personal Growth</td>
<td>23 ± 7.783</td>
<td>28.27 ± 3.955</td>
<td>0.002</td>
</tr>
<tr>
<td>3.</td>
<td>Existential wellbeing</td>
<td>28.93 ± 5.077</td>
<td>33.27 ± 3.973</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 2: Pre-Post Value Indicator for Child Health Leukemia in IRNA Child Hospital Dr. Soetomo Surabaya

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Mean ± SD treatment</th>
<th>Mean ± SD control</th>
<th>Difference test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>p</td>
</tr>
<tr>
<td>1.</td>
<td>Weight</td>
<td>12.93 ± 2.764</td>
<td>13.69 ± 2.461</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Leukosit</td>
<td>7373.3 ± 3295.08</td>
<td>6266.0 ± 2623.79</td>
<td>0.002</td>
</tr>
<tr>
<td>3.</td>
<td>Incidence of bleeding</td>
<td>4.13 ± 1.302</td>
<td>3.87 ± 1.06</td>
<td>0.041</td>
</tr>
</tbody>
</table>
Discussion

The results of the study showed that family abilities significantly influence children’s indicators. The family capacity in this study includes the results of family care indicators in caring for leukemic children, which consist of perceptual indicators about managing health, personal and family growth, and the existence of prosperous conditions.

The results showed that the majority of respondents were in the medium category on each indicator of parenting results, with the highest category on the indicator of family ability, in this case how the mother manages her health while providing care for leukemic children. The highest low category is an indicator of family ability to maintain the condition of existence of wellbeing while caring for children with leukemia. This shows that the family’s ability to treat leukemic children still needs to be improved.

The existential condition of welfare conditions (existential wellbeing) can be influenced by several factors, one of which is age. In this study, the age of the mother was mostly in the category <35 years (early adult). The life cycle in the early adult category, according to Erikson, is in the phase of generativity vs. stagnation. One of the tasks that must be achieved is to be able to devote themselves to achieving a balance between the nature of giving birth to something (generativity) by doing nothing (stagnation). Failure to improve the ability to give birth to something will cause stagnation in the family in providing care to a sick child. This is what can reduce the ability of the family to maintain welfare conditions in them.

The indicators of children in this study were the nutritional status of children, the incidence of secondary infections, and the occurrence of bleeding. Cancer and its treatment can affect energy intake and its use. The results showed that most child health indicators were in the moderate category. Indicators that have the highest good category are in indicators of nutritional status. This shows that the family’s ability to treat leukemic children is more visible in how parents improve their ability to meet the nutritional needs of children suffering from leukemia. Increasing family capacity in caring for children with chronic conditions is influenced by family knowledge and experience. The results of this study indicate that the ability of mothers to meet children’s nutritional needs can be seen in the indicator of increasing body weight of children suffering from leukemia. There are several factors that cause malnutrition in children with cancer, including: a) specific factors for tumors; b) factors related to patients; and c) factors related to treatment. The results also showed that children’s indicators of secondary infection aspects seen from laboratory values of leukocytes in children showed differences before and after intervention to mothers in improving their ability to care for leukemic children, even though the difference was not significant for changes in leukocyte values, but still within the limits normal. The description of laboratory values in children suffering from leukemia varies from mild to severe. The laboratory results are influenced by the age of the child. Likewise, for child health indicators that are seen from the frequency of bleeding events, based on the results of the study, there are differences in the decrease in the frequency of bleeding events before and after the intervention. Decreasing the incidence of infection and bleeding events is supported by the fulfillment of optimal nutritional needs carried out by the mother and can also be caused by the treatment process undertaken by children suffering from leukemia.

The family’s ability to care for leukemic children requires an effort made by health workers so that the family’s ability to care for leukemic children increases and children’s health indicators can also be improved.

Conclusion

The Family Centered Empowerment (FACE) model that is applied to families improves the health indicators of children with leukemia, which includes increased child weight, decreased incidence of secondary infection with indicators of leukocyte value stability, and decreased incidence of bleeding frequency. It was found that the FACE model for improving the ability of families to care for leukemic children found can be applied in families as one of the nurses’ references in providing child nursing care in chronic disease conditions.

Ethical Clearence: This study was stated as ethical conduct according to as stated in the ethical certificate issued by Dr. Seotomo Surabaya number 385/Panke. KKE/V/2018

Source of Funding: This research obtained funding from the Ministry of Research, Technology and Higher Education of Indonesia.
Conflict of Interest: The authors declare that they have no conflict of interest

References


Social Support and its Correlation with “3M Plus” Behavior in the Prevention of Dengue Hemorrhagic Fever

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¹Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

The incidence of dengue hemorrhagic fever has increased slightly in recent years. One of the factors is the decrease of the “3M Plus” behavior—draining bathtub regularly, covering water containers, burying garbage in the ground, plus other prevention attempts. The aim of this study was to analyze the correlation between social support with the “3M Plus” behavior in the prevention of dengue hemorrhagic fever. The study used a correlational method with a cross-sectional approach. The sample was 51 housewives in Surabaya. The independent variable was social support, while the dependent variable was “3M Plus” behavior. The data were collected by using Social Provision Scale questionnaire and “3M Plus” behavior questionnaire and analyzed by using Spearman rank correlation with α<0.05. A close positive relationship was found between social support with the behavior as p=0.01 and the coefficient correlation r=0.517. The findings show that the support from figures in the community is strongly related to the people’s “3M Plus” behavior. The government should involve, empower, and encourage the community public figures to be active in the prevention of dengue hemorrhagic fever.

Keywords: behavior, dengue hemorrhagic fever, social support, prevention program

Introduction

The incidence of dengue hemorrhagic fever (DHF) in the world continues to increase every year and has become a major global health focus. Around 2.5 billion people who live in tropical and subtropical countries are at risk, including the Indonesian people.¹ The outbreaks of DHF can be avoided if the early awareness and vector control systems are implemented properly, integrated and sustainable.² The government of Indonesia has conveyed information about these activities to prevent outbreaks of dengue fever in the community through Act No. 4 of 1984 concerning infectious disease outbreaks and Minister of Health Regulation No. 1501/Menkes/Per/X/2010 concerning certain types of infectious diseases that can cause outbreaks and efforts to overcome them.³⁴ Vector control through vector survey is regulated in Minister of Health Decree No. 581 of 1992, requiring that mosquito nest eradication activities are carried out periodically by the community coordinated by neighborhood and citizens associations in the form of a “3M Plus” prevention behavior program consisting of draining bathtub regularly (menguras), covering water containers (menutup), burying garbage in the ground (mengubur), plus other prevention attempts.⁵ Since then, the government has been promoting the program massively as a priority action in grassroots.

The success rate of mosquito nest eradication activities through 3M Plus can be measured by larvaefree index (LFI). If the LFI is more or equal to 95%, the transmission of DHF can be prevented.² However, the LFI in Indonesia reached 76.3% in 2012, 79.3% in 2013, and 80.9% in 2014.⁶ This shows that there is still a lot of work to do to prevent the DHF cases in Indonesia.

Several factors associated with the dengue prevention behavior are age, gender, duration of stay in a regency, total family members, as well as the perception of prevention behavior.⁷ The prevention program is also associated with community participation, intersectoral coordination, and community empowerment, as well as economic cost.⁸ ⁹ However, no prior study has been
conducted to identify the relationship between social support and the implementation of prevention behavior, especially in the 3M Plus program of Indonesia.

Social support can have an implication in a health behavior. Also, social support and leadership can influence the organizational commitment. It enables the promotion of 3M Plus behavior to be given by community leaders, because social support from community leaders in health behavior shows a high percentage of 58.97%. The components of social support consist of attachments, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance.

There are several factors that can influence a person’s behavior according to Green (1984), namely, enabling, predisposing, and reinforcing factors. These three factors support the social character of the community, including the reinforcing factors where community leaders provide innovation and behavioral encouragement so that the surrounding community will adopt this behavior and, in the end, there will be a change in the community behavior.

Thus, this research is aimed to identify the relationship between social support and 3M Plus behavior in the prevention of DHF in the community.

Method

This study used a correlational research design with a cross-sectional approach. The study involved 51 mothers in Benowo District, Surabaya. One respondent represented one household. The duration of the study was two months from May to June 2016. The inclusion criteria of the respondents were had obtained a senior high school degree, maximum age 50 years, healthy and had no mental disorder.

The variables were social support and 3M Plus behavior. The social support was measured using the Social Provision Scale (SPS) by Cutrona and Russel (1987). The SPS uses a 4-point Likert scale scoring with 1 stands for “very much disagree” and 4 for “very much agree”. The questionnaire had 24 items covering six domains, including attachment, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance. Meanwhile, the 3M Plus behavior was assessed using the instrument developed by Wuryaningsih (2008). The instrument consisted of 15 questions with two answers, “Yes” (Score: 1) and “No” (Score: 0). The interpretation of the total score was good for more than 10, enough for 5-10, and less for less than 5.

Data analysis used rank test correlation Spearmen test with significance level α <0.05. The data analysis used a quantitative method and was carried out for quantitative data covering the stages of descriptive and analytic analysis. This research will perform a descriptive analysis of all research variables by calculating the mean and standard deviation.

Results

Table 1 shows that the age of respondents was mostly in the range of 18-35 years, as many as 27 people (52.9%). Most respondents were unemployed or becoming housewives, as many as 34 people (66.7%). The majority of respondents’ income was still below the minimum regional wage (UMR), as many as 36 people (70.6%). There were only 18 people (33.5%) who had a family history of suffering DHF.

The respondents who obtained good social support were 30 persons (58.8%) and only one person (2%) had lack of social support. In addition, the majority of 3M plus behavior level was good (34 people; 66.7%) and enough (17 people; 33.3%). There was none who practiced less 3M behavior (Table 2).

Table 1: Distribution of demographic characteristics (n = 51)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-35</td>
<td>27</td>
<td>52.9</td>
</tr>
<tr>
<td>36-50</td>
<td>24</td>
<td>47.1</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>34</td>
<td>66.7</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>9</td>
<td>17.6</td>
</tr>
<tr>
<td>Labor</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below UMR*</td>
<td>36</td>
<td>70.6</td>
</tr>
<tr>
<td>Above UMR*</td>
<td>15</td>
<td>29.4</td>
</tr>
<tr>
<td>Family History of DHF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>33</td>
<td>64.7</td>
</tr>
<tr>
<td>Exist</td>
<td>18</td>
<td>35.3</td>
</tr>
</tbody>
</table>

*UMR = Minimum Regional Wages
Table 2: Social Support Level and 3M Plus Behavior (n = 51)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>30</td>
<td>58.8</td>
</tr>
<tr>
<td>Enough</td>
<td>20</td>
<td>39.2</td>
</tr>
<tr>
<td>Less</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3M Plus Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>34</td>
<td>66.7</td>
</tr>
<tr>
<td>Enough</td>
<td>17</td>
<td>33.3</td>
</tr>
<tr>
<td>Less</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3 shows that respondents who received good social support and had good 3M plus behavior were 26 people (51%) while respondents who received less social support and had enough 3M plus behavior were one person (2%).

The statistical analysis of the Spearman Rho correlation test shows that the p = 0.01 (<0.05) and the correlation coefficient (r) = 0.517. The results indicate that the H₀ is rejected. There are a significant relationship and a fairly strong level of relationship in a positive direction between social support and 3M Plus behavior in the prevention of DHF. It shows that, if the social support is increasing, the 3M Plus behavior will be also getting better.

Table 3: Cross-tabulation of Social Support and 3M Plus Behavior (n = 51)

<table>
<thead>
<tr>
<th>Social Support</th>
<th>3M Plus behavior</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Enough</td>
</tr>
<tr>
<td>Good</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>Enough</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Less</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>17</td>
</tr>
</tbody>
</table>

Spearman Rho p = 0.01; r = 0.517

Discussion

The study results show a strong positive relationship between social support and 3M plus behavior in the prevention of DHF, which means that the better the social support provided, the more the 3M Plus behavior is implemented. Social support is categorized as a reinforcing factor which can affect human behavior, in this case 3M Plus. In the DHF prevention strategy, a collaboration between the community, health workers and community leaders is needed. Community leaders themselves are one form of social support in society. A study also reveals that intersectoral coordination, community empowerment programs and routine control, which involve leadership of public figures, can change the behavior in dengue prevention. However, the respondents who have less behavior can be influenced by a lack of interaction with community leaders, even if the social support was good.

Further, social support is the result of the interaction of the situational context (certain influential life events), intrapersonal context (how someone sees themselves and the existence of important people around them and also the expectations in relationships with these people), and interpersonal contexts (subject relations with social support providers). The leaders also can provide counseling, which is also effective to change the prevention behavior in community. The results show as many as 12 people obtained enough social support, but had enough 3M plus behavior, while eight people got enough social support and had good 3M plus behavior, and one person got less social support but had enough 3M plus behavior. Such results also can be influenced by a personal factor, such as age, gender, duration of stay, perception and total family members.

The social support is the result of the interaction, one of which is intrapersonal interaction, namely, how someone sees themselves, the nature of the surroundings, public figures, and also the relationship expectation of these people. The good results can be the effect of the good relationship between respondents and community leaders, so that good collaboration is formed in the prevention of DHF through 3M Plus programs. The results are also strongly influenced by the willingness of the respondents to establish intense relationships with the community leaders. For respondents with less social support, but having sufficient 3M plus behavior, it is likely because the respondent did not want to establish a good relationship with community leaders because they were only 20 years old (too young) and did not have more emotional maturity like respondents aged 36-50 years. However, such respondents had an awareness of 3M Plus behavior in the prevention of dengue, because of having past experience that family members had been affected by dengue.
Conclusion

It can be concluded that the majority of respondents obtained positive social support and had good 3M Plus behavior. There is a meaningful relationship between social support and 3M Plus behavior in preventing DHF. Social support from public figures in the community is strongly related to the people’s 3M Plus behavior. The study recommends the government to involve, empower, and encourage the community public figures to be active in the prevention of dengue hemorrhagic fever.

Ethical Clearance: The study has obtained ethical approval from the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga, No: 192-KEPK.

Source of Funding: Self-funded.

Conflict of Interest: None.

REFERENCES


Factors Associated with Pulmonary Tuberculosis of Positive Acid Fast Bacilli in Surabaya

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ABSTRACT

The study aimed to explain the most important factors in the incidence of positive acid-resistant pulmonary tuberculosis. This study used a cross-sectional approach. The sample was 68, consisting of 34 AFB (Acid Fast Bacilli) positive and 34 AFB negative, determined by initial examination. Data was collected via questionnaires and analysed by univariate (frequency distribution) and bivariate using Chi Square test with significance number <0.05. The most influential BCG immunization status, education, smoking, occupation, knowledge, nutritional status, occupancy density, income and gender, indicate the relationship but the risk is neutral, while age and comorbidities have no significant associated risk. The risk factors contributing to positive AFB in Perak Timur and Tanah Kali Kedinding areas were BCG immunization status, education, smoking habit, occupation, knowledge, nutrition status and occupancy density.

Keywords: pulmonary tuberculosis, Acid Fast Bacilli positive, immunization status

Introduction

Pulmonary tuberculosis is a contagious chronic infectious disease, caused by the bacterium Bacillus resistant Mycobacterium tuberculosis which attacks lung parenchymal tissue. Mycobacterium tuberculosis species include: Mycobacterium tuberculosis, Mycobacterium africanum, Mycobacterium bovis.¹Pulmonary – prevention and control. 3.Tuberculosis – economics. 4.Tuberculosis, Multidrug-Resistant. 5.Annual Reports. 1.World Health Organization. ISBN 978 92 4 156505 9 (NLM classification: WF 300 Global Tuberculosis report 2015, found 9.6 million new cases of pulmonary tuberculosis in 2014 with the number of cases occurs in Southeast Asia (58%), the Western Pacific (58%) and Africa (28%).² Prevalence and incidence of pulmonary tuberculosis in 2014 increased to 647/100.000 and 399/100.000 population from the previous year of 272/100.000 and 183/100.000 population, as well as the mortality rate from tuberculosis in 2014 had increased to 41/100.000 population from the previous year, namely 25/100.000 from population.³

The Directly Observed Treatment-Short course (DOTS) strategy of tuberculosis is the World Health Organizations (WHO) recommended approach, which involves passive detection of Pulmonary Tuberculosis cases, primarily using sputum smear microscopy. The global target using the DOTS program was to detect 70% of new sputum-smear positive Pulmonary Tuberculosis cases.³ However, only 32% of new sputum-smear positive Pulmonary Tuberculosis cases estimated were detected throughout the globe.⁵

The prevalence of chronic cough and sputum positivity were significantly higher among males compared to females. The higher prevalence of persistent cough and AFB positive sputum among males need further exploration. High population density, malnutrition create a substantial risk for infection with Mycobacterium tuberculosis in Bangladesh.⁶ Factors AFB significantly associated with: age > 35 years, past history of TB treatment, BMI < 18.5Kgs/m², and being a male currently consuming alcohol in India.⁷and also studied geographical distribution and the presence of different M. tuberculosis strains in the survey area. A community-based cross sectional survey was carried out from July 2010 to October 2012 in

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Chennai city. Prevalence of bacteriologically positive PTB was estimated by direct standardization method. Univariate and multivariate analyses were carried out to identify significant risk factors. Drug susceptibility testing and spoligotyping was performed on isolated M. tuberculosis strains. Mapping of PTB cases was done using geographic positioning systems.

RESULTS:

Of 59,957 eligible people, 55,617 were screened by X-ray and/or TB symptoms and the prevalence of smear, culture, and bacteriologically positive PTB was estimated to be 228 (95% CI 189-265) History of contact with active tuberculosis patient and increased family size were significantly associated with smear positive pulmonary TB. This study aims to explain the factors associated with the incidence of acid bacilli positive pulmonary tuberculosis in Indonesia.

Method

Study Design, Setting, and Sampling: This cross-sectional study uses a survey conducted in two health centres there are Perak Timur and Tanah Kali Kedinding Located in Surabaya Indonesia. Two region health centres are the highest lung tuberculosis cases in Surabaya. The sample size 68 lungs tuberculosis patients. This consisted of 34 AFB (Acid Fast Bacilli) positive and 34 AFB negative. This study was conducted from 4-30 June 2018. After obtaining informed consent from each patient, a face to face interview was conducted using questionnaires requiring 10-20 min to be completed. Inclusion criteria: Age > 14 years. The results of the initial examination were positive in category I positive and negative smear, mentally healthy when doing the research, able to communicate well, able to write and read. Exclusion criteria is an incomplete answer.

Dependent variable in this study is incidence acid fast bacilli:

Data Analysis: Univariate and multivariate analysis was performed to look for any association between TB and risk factors such as age, gender, education level, occupation, income level, comorbidities, knowledge level, smoking habit, BCG immunization status, nutrition status, occupancy density.

Results

The results of univariate analysis found 68 respondents with pulmonary TB patients with positive smear (34) and negative smear (34). Among the 11 variables showed that there were 2 homogeneous variables (same), namely non-productive age (7.4%) and high income level (10.3%) because they were below 15% while the other variables were heterogeneous.

Table 1: Demographic characteristic of respondent 4-30 June 2018

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Acid Fast Bacilli</th>
<th>Total Frequency</th>
<th>Total Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Productive</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Non Productive</td>
<td>31</td>
<td>32</td>
<td>63</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>16</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>18</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Education level</td>
<td>High</td>
<td>7</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>27</td>
<td>15</td>
<td>42</td>
</tr>
<tr>
<td>Occupation</td>
<td>Work</td>
<td>9</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Unemployment</td>
<td>25</td>
<td>14</td>
<td>39</td>
</tr>
</tbody>
</table>
Table 2 showed statistical results of age factors obtained at \( p = 0.642 \) means \( p > 0.005 \), no significant relationship was found between age and the incidence of positive smear pulmonary TB. The results of the gender variable statistical test obtained a value of \( p = 0.049 \), so there was a relationship. CI value = 0.994-7.3331 showed that the CI value is not significant so it is neutral. Education factors were obtained at \( p = 0.003 \) means \( p <0.05 \), concluding that there is a significant relationship. The risk of incidence of positive pulmonary TB in smear is 4.9 times greater at the lower education level compared to the level of higher education to experience pulmonary smear positive AFB and is based on the value of CI = 1.672-14.273 which indicates a significant relationship.

Occupation test obtained a value of \( p = 0.007 \), indicating there was a significant relationship. The risk of incidence of pulmonary TB positive smear is 4 times greater in people not working rather than those in work. CI value = 1.426-11.04 which indicates a significant relationship. Income level test results obtained the value of \( p = 0.046 \) concluding that there is a relationship. CI value = 0.803-62,311 which indicates that the CI value is not significant because it includes number 1, so that it is neutral. There was no difference in the risk of positive smear pulmonary TB occurring between high and low income levels.

Comorbidities factor test obtained \( p = 0.128 \) it concluded that there was no significant relationship. The results of the statistical knowledge level test results obtained a value of \( p = 0.021 \), concluding that there is a significant relationship. The risk of positive AFB pulmonary TB incidence is 3.4 times greater in people with a sufficient level of knowledge than people with a good level of knowledge to experience positive smear pulmonary TB and CI value = 1.176-9,994 showed a significant relationship.

Smoking habit obtained \( p = 0.031 \) concluding that there is a relationship and positive smear lung is 4.3 times greater in people smoking than those who do not smoke. CI value = 1.066-17.389 showed a significant relationship. BCG immunization status were obtained \( p = 0.000 \), concluding that there is a questionable relationship between BCG immunization status and the incidence of positive smear pulmonary TB. The risk of occurrence of pulmonary TB positive smear is 47 times greater in people who are not immunized than people who are immunized. CI value = 5.753-386,291 showing that there is a significant relationship.

The nutrition status test results obtained \( p = 0.038 \) showing a significant relationship. The risk of positive pulmonary TB incidence is three times greater in people with underweight nutritional status than normal nutrition status for positive pulmonary TB and can be seen from the CI value = 1.042-8.8896 which showed a significant relationship. Occupancy density statistical test obtained a value of \( p = 0.028 \) it can be concluded that there is a significant relationship. The risk of occurrence of positive pulmonary TB incidence is 3 times greater in people who live in dense settlements than those who do not to experience the incidence of positive smear pulmonary TB and seen from the CI value = 1.108-8.049 which indicates a significant relationship.
Table 2: The relationship between demographic characteristics and the incidence of pulmonary TB

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Acid Fast Bacilli</th>
<th>Total</th>
<th>P value</th>
<th>OR</th>
<th>CI (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productive</td>
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<td>32</td>
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<td>34</td>
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<tr>
<td>Gender</td>
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<td>40</td>
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<td>28</td>
<td>100</td>
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<tr>
<td>Total</td>
<td>34</td>
<td>34</td>
<td>68</td>
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</tr>
<tr>
<td>Education level</td>
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</tr>
<tr>
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<td>7</td>
<td>19</td>
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<td>42</td>
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<td>Occupation</td>
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<td></td>
</tr>
<tr>
<td>Work</td>
<td>9</td>
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<td>34</td>
<td>68</td>
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<tr>
<td>Income level</td>
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<tr>
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<td>34</td>
<td>68</td>
<td>100</td>
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</table>
Discussion

The results showed no significant association between age and the incidence of smear positive pulmonary TB. The two age categories were respondents in this study, namely productive age (15-64 years) and non-productive age of more than 64 years. Univariate test results showed homogeneity in this factor so that it becomes that in one of the causes there is no significant relationship between age and the incidence of positive smear pulmonary TB. The results of this study are in accordance with the statement that ages 15-50 years have a high risk of experiencing pulmonary TB incidence three times greater than non-productive age. The majority of patients in the two health centres were mostly productive age. Most of the population of Indonesia is a productive age. Infectious diseases occur a lot in this age group.

Gender status was no difference in risk of occurrence of positive smear pulmonary TB between men and women. The results of this study are not in accordance with the statement prevalence of smear, culture, and bacteriologically positive TB was highest amongst men aged 55-64 years. and also studied geographical distribution and the presence of different M. tuberculosis strains in the survey area.

METHODS: A community-based cross sectional survey was carried out from July 2010 to October 2012 in Chennai city. Prevalence of bacteriologically positive PTB was estimated by direct standardization method. Univariate and multivariate analyses were carried out to identify significant risk factors. Drug susceptibility testing and spoligotyping was performed on isolated M. tuberculosis strains. Mapping of PTB cases was done using geographic positioning systems.

RESULTS: Of 59,957 eligible people, 55,617 were screened by X-ray and/or TB symptoms and the prevalence of smear, culture, and bacteriologically positive PTB was estimated to be 228 (95% CI 189-265 The activity between men and women going out to work, socializing can be a factor in this. The risk of transmission to infectious diseases is equally likely between men and women.

Education level is a factor significantly associated with smear-positive TB were education levels of primary, secondary education, occupation of merchant and urban residence. The majority are positive pulmonary TB patients with low education. Their education is at elementary and junior high school level. Education which has a low impact on health.

The majority of positive pulmonary smear patients do not work. Employment status can determine socioeconomic status. Low economic status affects mortality rates caused by disease. Pulmonary TB often occurs in low economic status, this is related to someone who does not work or unemployment. Work can determine the socioeconomic class of the community. The number of pulmonary smear positive TB patients who do not work causes them to be unable to healthy food, adequate shelter so that the risk of transmission of pulmonary TB is higher.

Low and high income levels both have the same effect on the incidence of positive (neutral) pulmonary TB. Socioeconomic and behavioural factors are also showed to increase the susceptibility to infection. the lower the economic status, the higher the risk of suffering from pulmonary TB. The majority of patients with positive pulmonary TB have low income. A person’s income level is very influential on a person’s behaviour in maintaining one’s own and family’s health. Revenue will affect the purchasing power of adequate nutritional and residential needs.

There was no significant association between comorbidities and the incidence of smear positive pulmonary TB. Along with-established risk factors (such as human immunodeficiency virus (HIV), malnutrition, and young age. No patients were suffering from HIV at the study site. This allows the absence of a relationship. The majority of smear positive pulmonary TB sufferers are accompanied by hypertension, vertigo and some people have insulin-controlled diabetes mellitus. The relationship between the level of knowledge and the incidence of pulmonary TB positive smear has a significant relationship. Good level of knowledge will be very stressed on increasing the regularity of care for pulmonary TB that takes a long time (6 months).

Tobacco smoking and alcohol use is highly prevalent in India, particularly among men. Active smokers have a greater risk of developing pulmonary tuberculosis. Biological explanations including impaired clearance of mucosal secretion, reduced phagocytic ability of alveolar macrophages and decrease in the immune response and or CD4 lymphopenia due to the nicotine in the cigarettes have been given as reasons for increased susceptibility to pulmonary tuberculosis.

Patients with pulmonary TB with no BCG scar and high initial AFB sputum intensity are at risk of remaining
sputum culture positive at the end of the second month of anti-TB treatment. These findings reflect a beneficial role for BCG vaccination on sputum conversion which should also be examined in large studies in other areas. The finding of a beneficial role for BCG vaccination on the treatment of pulmonary TB is important for TB control and vaccination programmes. Most respondents were never vaccinated with BCG, this is the factor that causes respondents to get pulmonary TB easily.

Respondents in this study were normal and underweight. Studies have showed that malnutrition (both micro- and macro-deficiency) increases the risk of TB because of an impaired immune response. Occupancy density has a significant relationship with the incidence of smear positive pulmonary TB.

**Conclusion**

Education level, smoking habit, occupation, knowledge, nutritional status, occupancy density, income and gender, indicate relationship but the risk is neutral, while age and comorbidities have no significant associated risk. The most dominant risk factors in the incidence of pulmonary tuberculosis acid fast bacilli in Indonesia is BCG immunization status.

**Ethical Clearance:** The ethical approval for this study was granted by the IRB committee of the Faculty of Nursing at the Airlangga University in 2018. No: 948-KEPK.

**Source of Funding:** Personal researcher.

**Conflict of Interest:** None

**REFERENCES**


Analysis of the Health Tasks of Families with Diabetes Mellitus (DM)

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ABSTRACT

The family is the entry point in providing nursing services in the community, the involvement of all family members is needed in carrying out health tasks as an effort to prevent and treat DM. This aim of the study was to analyse personal and family factors towards family health tasks that have family members with DM patients. The study design used an analytic observational design with a cross sectional approach, a population of 184 DM families, a sample of 67 respondents using cluster random sampling. Analysis was conducted using the Spearman rho test. The results of the research of the patient factors influencing family tasks are age (p = 0.003), gender (p = 0.837), education (p = 0.013), work (p = 0.936), duration of suffering (p = 0.538). Family factors that affect family health tasks are family type (p = 0.137), family development (p = 0.097), income (p = 0.001), knowledge (p = 0.001). The average health assignment is 56.7% less. DM patients and families need to increase their knowledge about DM, complications, prevention, treatment therapy and be able to maximize health facilities in providing continuous care.

Keywords: Family, DM, personal, family health tasks

Introduction

Family behaviour plays an important role in efforts to improve health and prevent disease. The family is the entry point in providing nursing services in the community, the involvement of all family members is needed in carrying out health tasks as an effort to prevent and treat DM. The family functions as a support system for members suffering from DM who demand greater economic, social, and psychological sacrifice from the family.¹ The inability of the family to carry out five family health tasks for people with DM can be caused by several factors, one of which is family knowledge and family social economy. Knowledge gained will also influence families to make the right decisions in choosing treatment measures for DM patients in accordance with the family economy. The task of family health in caring for DM patients is also needed such as routinely controlling blood sugar, regulating diet, handling patients when blood sugar drops and controlling the taking of some medicines have been carried out by the family partly because they do not care about patients and have often been warned but ignored by sufferers.²

World Health Organization (WHO) data in 2017 shows that the prevalence of people with DM with neuropathy reaches 50% and those with foot injuries is 15-25%. The results of the study in Arabic state that 70% of lower extremity amputations are DM patients with foot injuries.³ Indonesia ranks 7th in the world with the highest number of DM patients and estimates reaching 6.7-11.1 million sufferers (IDF, 2017). The results of the 2018 Riskesdas study indicates that the prevalence of DM in the population of Indonesia aged > 15 years increased to 8.5%. East Java ranks 5th in the number of people with DM in Indonesia, namely 7.4% (Ministry of Health, Republic of Indonesia & Ministry of Health, 2018). Surabaya itself has a higher incidence of diabetes than the national rate of around 7.6%.⁴ Data in one of the health centres in southern Surabaya shows that the number of new patient visits was between 200-350 patients per month (Kebonsari Health Center).

Seeing the high prevalence of people who have DM disease, it can be said that there is a high risk of diabetes
foot injury. The trigger factors for foot injuries are vascular damage and nerve damage. Decreased blood flow in the leg area can result in injury, the condition of neuropathy also causes sufferers not to feel the sensation of the foot area. Increased blood sugar levels that occur continuously can cause an imbalance of the material used by the intercell matrix, accumulation of sorbitol in the basement membrane of cells can cause disruption of microcirculation and thickening of cell membranes, so that inadequate cells receive oxygen and nutrients required. As a consequence of the occurrence of gangrene wounds.

The practice of family nursing as a centre of nursing is based on the idea that the family is the basic unit for carrying out nursing care for individuals and family members. Families are part of a community that has different cultural, social and economic differences, structure, functions and coping. The family carries out 5 health tasks, namely: 1) recognizing health problems, 2) being able to decide on appropriate health measures for the family, 3) being able to care for family members who experience health problems, 4) being able to maintain a healthy home atmosphere or modify the environment to ensure health family members; 5) able to utilize nearby health care facilities for families. Handling DM really requires the active role of individuals and families as a supportive system to optimize their health status. Families who cannot complete family health assignments are given an education towards the sufferers themselves, especially to families for initial treatment in the event of hypoglycaemia in patients, treatment to prevent diabetes injuries, prevention of relapse from diet and activity, and routine control of blood sugar until taking routine medication. The purpose of this study was to analyse patient and family factors in carrying out family health tasks in DM patients.

Method

The design uses the observational analytic method, where observations were made to identify the independent variables, which included patients and families affecting the dependent variable, that is five health tasks of families. Data retrieval is done by a cross sectional approach. The population in this study was a family with one family member suffering from DM in Surabaya, amounting to 184 families. The sampling technique in this study used probability sampling with cluster sampling with a total sample of 67 families in Surabaya. Independent variables are patient and family factors while the dependent variable is family health tasks, the data scale is ordinal.

The research instrument used questionnaire sheets and observations. The results of the validity and reliability test stated that the questionnaire that the researcher submitted was stated to be reliable or valid, the results of the reliability test value “Cronbach’s Alpha” (0.971). The bivariate data analysis used the Spearman rho statistical test with a significance level of p <0.05.

Results

This study showed the characteristics of patients with DM. In table 1, which includes the factors of age, sex, education, work, and duration of suffering from DM. Some of these factors are associated with family health tasks. From the results of data analysis, it was found that there were only 2 factors from patients related to family health tasks, namely age (p=0.003) and educational factor (p=0.013).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Family health task (N = 67)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Good</td>
<td>Enough</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(f)</td>
<td>%</td>
</tr>
<tr>
<td>Factors aged</td>
<td>45-54 year</td>
<td>5</td>
<td>45.4</td>
</tr>
<tr>
<td></td>
<td>55-64 year</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>&gt; 65 year</td>
<td>2</td>
<td>5.9</td>
</tr>
<tr>
<td>Sex</td>
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<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>8</td>
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</tr>
<tr>
<td>Education</td>
<td>Primary School</td>
<td>4</td>
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</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>2</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>Senior high school</td>
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<td></td>
<td>University</td>
<td>4</td>
<td>80.0</td>
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</table>
The characteristic family factor in this study found that characteristic family factors were associated with the implementation of family health tasks, which were seen from family type, family development, income, and knowledge factor. Table 2 is an analysis of family factors and health tasks.

In general, 59 families (88.1%) were able to recognize health problems well, 34 respondents (52.3%) were unable to decide the right actions for the family, 52 respondents (77.6%) were unable to provide care for their family members who had DM disease, 38 respondents (56.7%) were less able to modify the environment that could support health, and 43 respondents (64.2%) were less able to use health facilities.

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Frequency (N = 67)</th>
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<td>Extended</td>
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<td></td>
<td>Dyed</td>
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<td></td>
<td>Elderly</td>
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<tr>
<td>Family development</td>
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<td></td>
<td>VII</td>
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<td>13.7%</td>
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<td></td>
<td>VIII</td>
<td>2</td>
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<td>&gt;3.5 million</td>
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<td>8.3%</td>
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<tr>
<td></td>
<td>Low</td>
<td>2</td>
<td>6.5%</td>
</tr>
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</table>

The research data shows that many families of DM sufferers are lacking in carrying out family health tasks. The task of good family health is 9 people (13.4%), 20 people (29.9%) carried out sufficient health tasks and 38 people (56.7%) are lacking in carrying out family health tasks.
Discussion

The research data shows that many families of DM sufferers are lacking in carrying out family health tasks. Getting to know family health problems, namely the extent of the family, recognizes the facts of health problems that include understanding, signs and symptoms, causes and influences and family perceptions of the problem. Family recognition of the problem of DM includes knowledge about the understanding of DM, knowledge of the causes of DM and the role of the family in finding and collecting information and notifying family members about the problem of DM. The family is familiar with healthy conditions and changes experienced by family members from the observation of many families who say that DM disease is a hereditary disease, this disease can cause sores on the feet, this disease can be caused by lifestyle and eating patterns.

One of the family health tasks, namely that the family is able to make decisions regarding appropriate health actions, can be seen from: the extent to which families understand the nature and extent of the problem, whether the family’s health problems are felt, whether the family feels surrendered to the problem, whether the family feels fear of the consequences of the action of the disease, whether the family has a negative nature of health problems, whether the family can reach existing health services, whether the family lacks trust in health workers, whether the family is misinformed in dealing with problems. All factors that influence a family’s ability to make decisions are the effects of positive knowledge obtained by the family. Families provide the necessary actions for family members who experience DM such as choosing good health facilities with BPJS services, choosing the right treatment and knowing the consequences and benefits of each action that will be taken. The family immediately brings patients to the nearest health service if they experience DM complaints such as symptoms of dizziness, dizzy eyes and tingling.

Families are able to care of family members who are sick, especially those with DM, must be able to make complex behavioural changes, for example by making meal planning, physical exercise, hypoglycaemic efficacy drugs and counselling. Family-owned experience and knowledge can help families take appropriate care to reduce health problems experienced by families. The family in providing care is shown by carrying out simple treatments for prevention to a minimum in accordance with the abilities that the family has. There are still many family tasks regarding care that have not been carried out properly, especially regarding the regulation of eating in DM patients, routine blood sugar control every month and minimal family economic conditions.

The family response when there are sick family members varies greatly from not doing anything with unobtrusive reasons, taking certain actions such as self-medication, looking for traditional health facilities, seeking treatment at drug stalls, seeking treatment to modern health facilities organized by the government or private institutions such as medical centres, health centres, hospitals to find modern treatment organized by practicing doctors. Based on the data of respondents characteristics that the respondents work varied and the majority of the respondents jobs were entrepreneurs and some traders were also just housewives. According to Fautino (2008) the higher the quality of one’s work, the higher the income earned, and vice versa. So this makes it easier for people to reach existing health services. Health services that are quite far from their homes make families reluctant to bring sick family members to health services. Someone who has been diagnosed with diabetes for years can receive a diagnosis of his illness and treatment regimen, and have a better adaptation to his illness by integrating new lifestyles in their daily lives. Someone explained that the duration of DM at the time of diagnosis was confirmed by the fact that it did not provide a description of the duration of DM, even though diabetes may have occurred beforehand but the patient did not know because there were no significant symptoms from DM. In fact, people with shorter duration of suffering from more DM cannot perform health tasks properly.

The income category shows the value of \( p = 0.001 \) (\( p \) value <0.05) so it is concluded that there is a relationship between family income and family health tasks. According to Friedman’s theory (2010), it is known that the level of socio-economic status influences a person’s health. Families with high income levels and utilization of health services and prevention of disease also increase compared to low income will have an impact on the lack of utilization of health services in terms of health care due to drug purchasing power and costs incurred in visiting health care centres, this economic situation or income holding important role in improving family
health status and one’s development. The knowledge category shows the value of $p = 0.001$ (p value <0.05), it is concluded that there is a relationship between family knowledge and family health tasks. People with high knowledge find it easier to understand health behaviours compared to people with low levels of knowledge. Knowledge held by respondents regarding diabetes and management will create awareness for them and eventually will cause them to behave according to what they know. Knowledge is one of the drivers for someone to change behaviour or adopt a new behaviour. Family members who have knowledge of DM are expected to carry out the task of caring for DM patients well.12

**Conclusions**

Family independence in carrying out family health tasks that have family members who suffer from DM needs more attention. Age, education, income and family knowledge factors influence the family’s ability to carry out family tasks. So it is necessary to modify these factors through several efforts to empower families, education, health promotion, and cross-sectoral efforts related to national health insurance.

**Ethical Clearance:** the ethical approval this study by the IRB committee of nursing at Stikes Hang Tuah Surabaya with number 023/KEPK-LP3M/X/SHT/2018

**Source of Funding:** No funding for this research

**Conflict of Interest:** None

**REFERENCES**


Evaluation of Patient Satisfaction and Nurse Caring Behaviour: Based on Swanson’s Theory

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ABSTRACT

Caring is a hospital strategy by which to achieve patient satisfaction. The aim of this study was to assess patient satisfaction with nursing care and to identify the predictors based on Swanson’s theory of caring, including compassion, competence, and upholding trust. Cross-sectional studies were conducted in patients at a hospital in Kediri District (n = 390 by simple random sampling) from May to October 2018. The instrument in this study was developed in accordance with the standard guidelines of Swanson’s theory, and patient satisfaction was measured using PSQ (Patient Satisfaction Questionnaire). Multiple linear regression was used to identify predictors. The mean score of client satisfaction was 6.09 (SD = 0.936) (range of possible score = 1-10). Upholding trust (0.02), Compassion (0.03), and competence (0.03) significantly predicted client satisfaction (R Square = 0.895). The constructs of Swanson’s Theory significantly predicted patient satisfaction. This study supports an investigation about the factors underlying client satisfaction on a larger scale, as well as the identification of targets in designing future interventions.

Keywords: Caring, Patient Satisfaction, Swanson’s Theory of Caring

Introduction

Caring is the main thing used by hospitals or other health services to achieve patient satisfaction. Some experts agreed that patient satisfaction is the key of existing hospitals or other health services.¹ Patients could feel satisfied when caring was as expected.² That statement makes nurse caring behaviour the main part of patient satisfaction used as the evaluation of health services.³ Caring as the evaluation of health service becomes a trend in this era.⁴ The wave of health service marketing has changed from an excellence service era to care with character era, with caring values as the principle in health services.⁵ The correlation between caring and hospital services and patient satisfaction was proven by research.⁶ Health service researchers, health service centres, and the regulators of health services also admitted that patient satisfaction is a part of a constituent’s clinic report.⁷

Based on the data of one of hospital in Kediri city, it shows that the number of patient satisfaction to nursing service is less than 80%. In 2017, the number of patient satisfaction decreased, from 79% in 2016 to 77% in 2017. That number is still under Indonesia government standard which determines that satisfaction must be over 85%. This case is often correlated to low nurse skills in caring for patients. Based on research about caring, it showed that up to now, caring is understood as empathy.⁸

As an effort of increasing patient satisfaction, a nurse must have standard caring skills to provide medical services to patients. Therefore, the goal of this research is to measure patient satisfaction and to observe factors affecting satisfaction itself.

This research uses Swanson’s Theory of Caring as a framework. Swanson argued that caring is correlated to both nurse philosophical behaviour and nurse performance, namely always giving information, understanding, delivering messages, conducting therapy, and wishing the best final result.⁹ All nurse caring skills are classified into three main constructs from Swanson’s Theory of Caring such as; Upholding Trust, Compassion, and Competence.¹⁰ Qualitative research from Belgium
shows that the main construct from Swanson’s Theory of Caring can measure nurse caring skills. While nurse caring skill itself is really correlated to patient satisfaction.

Therefore, we argue that Swanson’s Theory of Caring can explain directly the level of patient satisfaction. In this research, we explore some factors associated to the level of patient satisfaction based on the construct of Swanson’s Theory of Caring. The hypothesis we offered, Upholding Trust, is associated with the level of patient satisfaction. Comparison is associated to the level of patient satisfaction, and competence is associated to the level of patient satisfaction.

Method

Study Design, Setting, and Sampling: Cross-sectional studies were conducted in patients at a hospital in Kediri District. The recruitment of respondents used simple random sampling. Respondents consisted of patients hospitalized for more than two-day care. Patient having co-morbidity (insanity and neoplasia), and patients not finishing the questionnaire was beyond the research. This research was conducted on 390 hospitalized patients agreeing to join in this research.

Study Variables: The independent variables were upholding trust, compassion, and competence while the dependent variable was the level of patient satisfaction.

Instrument: The data collection method used a questionnaire. The test of patient satisfaction level used PSQ (Patient Satisfaction Questionnaire), while to test Upholding Trust, Compassion, and Competence used an instrument developed from the instrument standard of Swanson’s Theory of Caring.

1. Swanson’s Theory of Caring Questionnaire: This instrument’s purpose is to test nurse caring skills. We got permission from Swanson via e-mail to use and translate this instrument. The translation process was conducted to suit the conditions in the research area. This instrument has questions related to upholding trust, compassion, and competence, with 5 questions each of them.

2. PSQ (Patient Satisfaction Questionnaire): This instrument aims to test the level of patient satisfaction to health service. PSQ has 18 points, and it is divided into 9 favourable points and 9 unfavourable points. The point distribution in PSQ as follows: the aspect of satisfaction (2 points), technique quality (4 points), interpersonal attitude (2 points), communication (2 points), financial aspect (2 points), time with doctor (2 points), and access and comfort (4 points).

Data Analysis: The data was analysed by SPSS version 22. Multiple linear regression was used to identify the contribution of upholding trust, compassion, and competence variable to patient satisfaction. The redundancy variable in this research are socio-demographic factors such as; sex, education, job, and age. Pearson correlation analyses were used to view the correlation between socio-factors and patient satisfaction. The significant level applied was p < 0.05.

Results

Socio-demographic characteristics of the respondents: 390 respondents in this research responded 100%. They are on average 36.6 years old. More than 55.4% of respondents are male. 58.3% of respondents’ educational background are elementary school, 39.8% are high school, and 1.9% are college. Most respondents (71.2%) are staff, 3.8% are civil servant, 1.9% are policemen/military, and 23.1% are jobless. Age, education, and occupation are statistically correlated to satisfaction level, while sex does not determine patient satisfaction.

Table 1: Predicting patient satisfaction from demographic characteristics (n = 390)

<table>
<thead>
<tr>
<th>Age (%)</th>
<th>Mean</th>
<th>SD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>55.4</td>
<td></td>
<td>0.926</td>
</tr>
<tr>
<td>Female</td>
<td>44.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary school</td>
<td>58.3</td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>High school</td>
<td>39.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil servants</td>
<td>3.8</td>
<td></td>
<td>0.004</td>
</tr>
<tr>
<td>Private employees</td>
<td>71.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Police/military</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not employed</td>
<td>23.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patient satisfaction: The mean score of patient satisfaction in this research is 13.09 (SD = 1.36) range of possible score = 0-18). Based on the result of questionnaire analyses, more than 60.2% respondents
stated, “The medical care I have been receiving is just about perfect”, but more than 60.2% also stated, “Nurses sometimes ignore what I tell them”, and 45.8% respondents stated, "I find it hard to get an appointment for medical right away”. The result of data collection from PSQ-18 can be viewed in table 2.

Table 2: Patient satisfaction (n = 390)

<table>
<thead>
<tr>
<th>Item of PSQ-18</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General satisfaction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The medical care I have been receiving is just about perfect.</td>
<td>60.3</td>
<td>39.7</td>
</tr>
<tr>
<td>I am dissatisfied with some things about the medical care I receive.</td>
<td>35.6</td>
<td>64.4</td>
</tr>
<tr>
<td><strong>Technical quality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think my doctor’s office has everything needed to provide complete medical care.</td>
<td>71.1</td>
<td>28.9</td>
</tr>
<tr>
<td>Sometimes nurses make me wonder if their diagnosis is correct.</td>
<td>70.2</td>
<td>29.8</td>
</tr>
<tr>
<td>When I go for medical care, they are careful to check everything when treating and examining me.</td>
<td>69.8</td>
<td>30.2</td>
</tr>
<tr>
<td>I have some doubts about the ability of the doctors who treat me.</td>
<td>70.6</td>
<td>29.4</td>
</tr>
<tr>
<td><strong>Interpersonal manner</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurses act like they are forced to treat or are too impersonal towards me.</td>
<td>58.9</td>
<td>41.1</td>
</tr>
<tr>
<td>My doctors and nurses treat me in a very friendly and courteous manner.</td>
<td>64.8</td>
<td>65.2</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurses are good at explaining the reason for medical tests.</td>
<td>70.7</td>
<td>29.3</td>
</tr>
<tr>
<td>Nurses sometimes ignore what I tell them.</td>
<td>60.2</td>
<td>39.8</td>
</tr>
<tr>
<td><strong>Financial aspects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel confident that I can get the medical care I need without being set back financially.</td>
<td>69.8</td>
<td>30.2</td>
</tr>
<tr>
<td>I have to pay for more of my medical care than I can afford.</td>
<td>70.6</td>
<td>29.4</td>
</tr>
<tr>
<td><strong>Time spent with doctor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Those who provide my medical care sometimes hurry too much when they treat me.</td>
<td>58.9</td>
<td>41.1</td>
</tr>
<tr>
<td>Nurses usually spend plenty of time with me.</td>
<td>44.8</td>
<td>55.2</td>
</tr>
<tr>
<td><strong>Accessibility and convenience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have easy access to the medical specialists I need.</td>
<td>60.4</td>
<td>39.6</td>
</tr>
<tr>
<td>Where I get medical care, people have to wait too long for emergency treatment.</td>
<td>68.8</td>
<td>31.2</td>
</tr>
<tr>
<td>I find it hard to get an appointment for medical right away.</td>
<td>45.8</td>
<td>54.2</td>
</tr>
<tr>
<td>I am able to get medical care whenever I need it.</td>
<td>70.4</td>
<td>29.6</td>
</tr>
</tbody>
</table>

The correlation between socio-demographic factor to patient satisfaction: The analyses of Pearson correlation showed that there was no significant correlation between sex and patient satisfaction (p=0.926) while age, education, and occupation are correlated to patient satisfaction: age (p=0.021), education (p=0.03), occupation (p=0.004). The detailed results can be viewed on table 1.

The effect of upholding trust, compassion, and competence to patient satisfaction: The mean of every variable is 10.42 (SD = 1.72) for upholding trust variable (range of possible score = 5–15), 12.53 (SD = 2.74) is for compassion variable (range of possible score = 5–15), and 13.42 (SD = 2.8) is for competence variable. Regression linear multiple analyses show that upholding trust, compassion, and competence are significant at once in predicting patient satisfaction (p = 0.00) (R Square = 0.895), if it was viewed from significance level differently, it will show that (p = 0.02) is for upholding trust, (p = 0.03) is for compassion, and (p = 0.03) is for competence.

Table 3: Frequency distribution of Swanson’s Theory of Caring construct (n = 390)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Range of Possible Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upholding trust</td>
<td>10.42</td>
<td>11</td>
<td>1.72</td>
<td>5 – 15</td>
</tr>
<tr>
<td>Compassion</td>
<td>12.53</td>
<td>12</td>
<td>2.74</td>
<td>5 – 15</td>
</tr>
<tr>
<td>Competence</td>
<td>13.42</td>
<td>13</td>
<td>2.18</td>
<td>5 – 15</td>
</tr>
</tbody>
</table>
Table 4: Predicting patient satisfaction from upholding trust, compassion, and competence

<table>
<thead>
<tr>
<th>Variable</th>
<th>R Square</th>
<th>β</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upholding trust, compassion, and competence</td>
<td>.895</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>(simultaneously).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upholding trust.</td>
<td>.404</td>
<td>0.020</td>
<td></td>
</tr>
<tr>
<td>compassion.</td>
<td>.369</td>
<td>0.031</td>
<td></td>
</tr>
<tr>
<td>competence</td>
<td>.218</td>
<td>0.034</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

This research found that patient satisfaction in hospitals where this research was conducted had a mean score 13.09 (range of possible score = 0-18). It was not a good research finding yet, because the experts agreed that patient satisfaction is the key of hospitals, or other health service exist. We found that most respondents were satisfied enough for caring from nurses, but some respondents stated that nurses used to ignore what they wanted, and more than half respondents stated that it was hard to make a medical appointment soon. It may be caused by the abundance of nurse responsibility in research location, and low nurse motivation, so it makes their performance in caring patient decrease. It was supported by some experts’ opinions that nurse responsibility abundance is correlated to nurse caring behaviour. In this research, socio-demographic factors (like sex, education, and occupation) is correlated to patient satisfaction, but it is not correlated to sex. It was also reported in a research that every social situation of individual could affect their perception to health service satisfaction. In the effort of increasing patient satisfaction, hospital or other health service management must fix the standard of caring based on the social situation around them.

This research tries to observe the factors effecting patient satisfaction based on Swanson’s Theory of Caring. The research result shows that the main construct of Swanson’s Theory of Caring (upholding trust, compassion, and competence) can explain more than 85% kinds of patient satisfaction. In this research, we found that the construct of Swanson’s Theory of Caring could explain the patient satisfaction in a hospital (research location) as documented on previous study. It was known that upholding trust, compassion, and competence can predict nurse skill caring, while nurse skill caring itself is correlated to patient satisfaction. Other research explained that Swanson’s Theory of Caring can be used as a approach in nursing models to develop more holistic nursing science. That statement makes nursing caring attitude the main part of patient satisfaction used as evaluation system of health services. Caring as a health service is a trend in this era. The wave of health service marketing has changed from an excellence service era to a care with character era becoming caring value as a principle of health service. Information, motivation, and behaviour skill are the main factors to influence performance behaviour called nurse caring behaviour in this research. This study only investigates the description of patient satisfaction and caring factors that influence it, we do not investigate how good caring and bad caring are.

Figure 1: Extended Swanson’s Theory construct to predict patient satisfaction. Notes: Statistics reported next to arrows are standardized regression coefficients. *p < 0.001 ; ** p < 0.05

Conclusion

We found patient satisfaction in less good condition in this population, because as we know patient satisfaction is the key to hospitals and other health services’ existence. Socio-demographic factors (age, education, and occupation) is correlated to patient satisfaction, but not to sex. We also found that the construct of Swanson’s Theory of Caring can explain patient satisfaction in hospital research. This study helps professional health officials and researchers to understand patient satisfaction. Further research must apply Swanson’s Theory of Caring as an intervention and measure the success in increasing patient satisfaction, because evidence-based nursing practice needs a nursing guidance model to develop the holistic nursing practice and application. This study supports both researchers and professional nurses to observe the based-factors of patient satisfaction on a wider scale, and to identify the target in arranging intervention in the future.
Ethical Clearance: The informed content was gotten from all respondents before joining in this research. The research protocol was approved by the Indonesia health research ethic committee.

Source of Funding: Self

Conflict of Interest: None

REFERENCES


The Correlation between Family Support and Quality of Life in Mothers with Positive HIV in Surabaya

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1Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

The quality of life of mothers with positive Human Immunodeficiency Virus (HIV) is a concern due to a lack of family support. The aim of this study was to determine the relationship between family support and the quality of life of mothers living with positive HIV in Surabaya. This was a descriptive correlational study with a cross sectional approach. The subjects were 30 mothers with positive HIV from two public health care facilities in Surabaya who were already confirmed to have positive HIV by healthcare professionals without manifestation of Acquired Immune Deficiency Syndrome (AIDS). Family Support Questionnaires used were family support and World Health Organization Quality of Life (WHOQOL) HIV for quality of life. The data was analysed using Spearman’s Rho correlation test with P value < 0.05. The result showed that the majority of respondents are in early adulthood (26-35 years). Some respondents had HIV for less than 4 years and used anti retro viral (ARV) for 2 years. There was a moderate positive correlation between family support and quality of life of mothers with positive HIV (P = 0.026, Spearman’s rho = 0.48). The better the family support, the higher the quality of life which may be achieved by the clients.

Keywords: family support, quality of life, mother, HIV

Introduction

HIV cases cause various effects on sufferers, in addition to reducing the body’s resistance and the emergence of opportunistic infections (OIs), patients can also experience psychological and social problems.1 The HIV epidemic is a global crisis and a serious challenge to developmental and social progress. Since its start in 1981, AIDS has become a major health problem worldwide. There have been more than 78 million people infected with HIV by the end of 2013 with people living with HIV/AIDS amounting to 35 million.2 In Indonesia, the number of new HIV infection cases is known to be 8,908 people, these cases have increased twice compared to 2013 where 6,528 (42.0%) cases were women. According to the type of work, the housewife group ranks highest.3 The highest percentage of the age of HIV infection was reported in the age group 25-49 years (68%), followed by the age group of 20-24 years (18.1 %). East Java entered second province (19,249 cases) after DKI Jakarta (32,782 cases).4 The city of Surabaya has the largest number of cases of HIV in East Java.5 HIV cases in Surabaya have the potential to cause problems because until 2016, the age group affected by HIV was highest in the age range of young adults, the productive phase. Young adulthood begins at the age of 25 years and ends at age 40.5

HIV cases caused various effects on sufferers in addition to reducing the body’s resistance and the emergence of opportunistic infections (OIs), patients can also experience psychological and social problems.1 Family support can have a positive impact on improving the quality of life for people with HIV.6 Quality of life in people with HIV is very important to understand because this infectious disease is chronic and progressive so that it has a broad impact on all aspects of life. Quality of life is an important component in evaluating the well-being and life of people with HIV.7 Family support has an important role to improve coping with one’s adaptation to situations that are full of pressure, reduce morbidity and discipline treatment for clients and indirectly support family support to improve one’s physical health.8

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In Surabaya, there are four public health care facilities which provide HIV/AIDS treatment services; public health care Sememi, public health care Perak Timur, public health care Putat Jaya and public health care Dupak. Some mothers of HIV who were met at the Public health care Dupak said that they came to the Public health care Dupak rarely accompanied by family, and still fulfilled their daily needs without assistance from the family. They often feel that they are excommunicated by their families even though they live in one house after their husbands die, they worry that their neighbours will move away with the disease so they choose to keep it a secret. They also revealed disturbances in appetite, sleep disturbances, disruption of relationships with family and the environment and physical discomfort due to taking ARVs. The purpose of this study was to determine the relationship of family support and quality of life of mothers with HIV positive in Surabaya.

Method

Study Design, Setting, and Sampling: A cross-sectional data collection on mothers with HIV positive was conducted. The population in this study were 16 HIV positive women in public health care Dupak and 20 HIV positive women at public health care Sememi so that the population was 36 HIV positive women. Inclusion criteria to enter the study were; HIV positive mother whose status is known to the family, able to read and write, doesn’t stay nomadic and which is not accompanied by AIDS. This study used purposive sampling which obtained 30 samples at public health care Dupak and public health care Sememi.

Study Variables: The independent variable in this study was family support which was measured using a family support questionnaire based on the theory of family support from house which had been tested for validity and reliability. This consisted of 18 question items representing 5 sub-variables, namely informational support (11-13), award support (14-16), instrumental support (6-10), emotional support (1-5) and social network support. The questionnaire is presented in 4-grade Likert scale.10

The dependent variable in this study is the quality of life (QOL) of mothers who were HIV positive who were measured using the life quality from WHOQOL-HIV BREF. This questionnaire consists of 31 questions with 29 items included in the calculation of scores and two items of questions that measured the quality of life and general health conditions. The questionnaire is presented in a 5-grade Likert scale.11 The WHOQOL-BREF has been recommended as the most suitable instrument for assessing the QOL of various people.12 This questionnaire have been tested for validity and reliability with the Cronbach Alpha test.

Data Analysis: The results were analysed using Spearman’s correlation test due to the skewed distribution of data with a significance level of α<0,05.

Results

There were 30 mothers with HIV who were respondents to the study. The majority are 26-35 years old (50%), as many as 60% of respondents are still married, have used ARVs for 2 years (50%) and have children ≥1 - ≤2 (57%) (table 1).

Table 1: Participants demographics. (N = 30)

<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17-25 years</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>26-35 years</td>
<td>15</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>36-45 years</td>
<td>10</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>46-55 years</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>2.</td>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elementary school</td>
<td>7</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>10</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Senior high school</td>
<td>10</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>No School</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>3.</td>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>18</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Widow</td>
<td>12</td>
<td>40%</td>
</tr>
<tr>
<td>4.</td>
<td>Health Last 2 Weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enough</td>
<td>9</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>14</td>
<td>47%</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>7</td>
<td>23%</td>
</tr>
<tr>
<td>5.</td>
<td>Health Conditions (during research)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>28</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>Not Healthy</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>6.</td>
<td>Duration using ARVs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 – 2 years</td>
<td>15</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>3 - 4 years</td>
<td>6</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>&gt; 4 years</td>
<td>9</td>
<td>30%</td>
</tr>
<tr>
<td>7.</td>
<td>Years of being tested for HIV</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>≤ 4 years</td>
<td>17</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>&gt; 4 years</td>
<td>13</td>
<td>43%</td>
</tr>
<tr>
<td>8.</td>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Islam</td>
<td>28</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>Christian</td>
<td>2</td>
<td>7%</td>
</tr>
</tbody>
</table>
Table 2: Frequency distribution of family support and quality of life

<table>
<thead>
<tr>
<th>Variables measured</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Support</td>
<td>Less</td>
<td>5</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Enough</td>
<td>4</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Well</td>
<td>21</td>
<td>70%</td>
</tr>
<tr>
<td>Quality of life</td>
<td>Enough</td>
<td>18</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Well</td>
<td>10</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>2</td>
<td>7%</td>
</tr>
</tbody>
</table>

Total                  | 30           | 100% |

The results showed that there is a significant correlation between family support and the quality of life of mothers with HIV positive in Surabaya (table 3).

Table 3: Relationship between family support and quality of life

<table>
<thead>
<tr>
<th>Family support</th>
<th>Quality of life</th>
<th>Total</th>
<th>p-value</th>
<th>r-count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>Enough</td>
<td>0</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Well</td>
<td>1</td>
<td>3%</td>
<td>0</td>
</tr>
<tr>
<td>Enough</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enough</td>
<td>0</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Well</td>
<td>9</td>
<td>30%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Very good</td>
<td>2</td>
<td>7%</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>10</td>
<td>33%</td>
<td>2</td>
</tr>
</tbody>
</table>

Description: p = significance value (<0.05) r = correlation coefficient (> 0.3494).

Discussion

This study shows that there is a significant correlation between family support with the quality of life of mothers who are HIV positive in Surabaya. Contingency (r) it obtained 0.405 which means that the relationship of family support with the quality of life of mothers who are HIV positive has a moderate strength correlation. Family support is one factor that is significantly related to quality of life in HIV clients where clients with good family support are more likely to have a good quality of life. Families who support people in China who are living with HIV/AIDS (PLWHA) have a 61% chance, 1% more to get a good quality of life compared to those who do not support.  

The majority of respondents received good family support while the rest received less family support and sufficient family support. The role of the family is very important in client health care. Family support is needed by HIV sufferers as a support system or main support system so that they can develop effective responses or are coping to adapt well in dealing with the stressors they face in relation to their physical, psychological, and social illness. Family support can have a positive impact on the quality of life for people with HIV. Furthermore, among HIV-infected adults whose relationships between social support and psychological adjustment were examined, greater support, including financial and spiritual support, was found to reduce psychological distress, such as symptoms of depression.

The existence of family support will make families able to function with various intelligence and reason, so that it will improve their health and adaptation in life. In concept, the existence of chronic diseases such as HIV/AIDS will reduce the quality of life of patients. This disease can develop even worse if the client experiences pressures from both family and society. This will affect the physical and psychological conditions of the client. The long and prolonged pressure will have an impact on the immune system and accelerate the progression of the disease. If the pressure from the client can be controlled, the modulation of the immune system is to be better so that the quality of life becomes good.
The results showed that the majority of respondents had a quality of life in sufficient condition. Quality of life is an individual’s ability to enjoy satisfaction during life. Clients with HIV who have sufficient quality of life categories up to very good categories can also be affected by regular consumption of ARVs. ARV therapy will stop HIV activity, restore the immune system and reduce the occurrence of OIs, improve quality of life and reduce disability. Quality of life itself is influenced by various factors, namely the presence of sex, age, education, occupation, marital status, income, religion, how long the client has HIV, how long the client has consumed ARVs and so on. A good environment around HIV clients can improve the quality of life of clients.

About 50% have used ARVs for 2 years with the healthy condition during data collection. Zhang reported that approximately 81% of HIV-infected patients in China had symptoms when they began ART. Another study indicated that the QOL of patients with symptoms would see more pronounced improvements than those without symptoms after ART. Generally, with the increase of therapy time, the QOL of people infected with HIV showed a rising trend from baseline to 24 months. However, more in-depth research is needed to better understand the underlying causes for the plateau and, in some cases, decrease. In particular, greater attention should be paid to patients after 6 months in order to continuously improve patient quality of life.

Educational factors influence the quality of HIV positive mothers. Individual education factors will relate to the level of insight and knowledge. The level of education is one of the factors that influences the quality of life of clients of HIV and AIDS. Based on the results of the study, it was found that the average duration of suffering was approximately 4 years. Long suffering from the disease is a significant factor affecting quality of life.

In this aspect of limitation explained the obstacles or limitations of researchers during conducting research, among others: filling out questionnaires takes longer. The thing that is feared is influencing the respondent’s answer because this filling in of the form can disrupt the respondent’s daily activities and the respondents’ collection techniques that are different between public health care Dupak and Sememi, are feared to influence respondents’ answers in filling out the questionnaire. The public health care Dupak collection technique meets the respondent directly (door to door) while at the public health care Sememi they are collected by respondents at one time.

Conclusion

Family support is related to the quality of life of HIV-positive mothers in Surabaya. The better the family support, the higher the quality of life of the client. The majority of HIV positive mothers have good family support. Further development in information has other factors (health worker support, community behaviour, the effect of ARV therapy etc.) that can affect the quality of life of patients with HIV/AIDS.

Ethical Clearance: This study did not use animals and does not mention the identity or medical record of the respondents. The ethical approval for this study was granted by the IRB committee of the Faculty of Nursing at the Airlangga University no. No. 186-KEPK June 2016.

Source of Funding: Self-funded.

Conflict of Interest: None.

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5. Surabaya Health Office. 2015 Health Profile. Surabaya Heal Off. 2015;


The Effect of Balance Exercise on Postural Balance of Elderly as Fall Prevention in Institutionalized Elderly

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1Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

The common problem of elderly physical changes is a postural balance which can increase the incidence of fall. Balance exercise is an exercise program to increase the postural balance of elderly. This study aims to analyze the effect of a balance exercise that increases elderly postural balance. This study was a quasi-experimental design. The samples were 28 respondents from Wana Seraya Denpasar Nursing home based on inclusion criteria and divided into treatment group and control group containing 14 respondents in each group. The variable was elderly postural balance with balance exercise as the intervention. The participants were evaluated using the Berg Balance Scale. This study used the Wilcoxon Signed-Rank Test and Mann Whitney Test. The results showed that there was an increase in the postural balance in the treatment group (p=0.014), but, in the control group, there was no change (p = 1.00). There was a significant effect of balance exercise in increasing elderly postural balance with the value of p=0.001. A positive effect of the balancing exercise in the postural balance in institutionalized elderly subjects was found. This study recommends balance exercise for providing elderly postural balance that helps to decrease fall incidence among the elderly.

Keywords: balance exercise, postural balance, elderly

Introduction

The age-related change of the elderly will affect the ability to carry out daily activities. The physical problems that most often occur in the elderly are balance disorders so that they easily fall. Falls in the elderly are an increasing problem, causing a high degree of morbidity, mortality, and use of healthcare services. Falling in the elderly is associated with complications that cause prolonged hospitalization, isolation, dependency, immobility, decreased function, increased mortality rate and increased healthcare costs. Various risk factors that can increase falls in the elderly include disorders of the sensory system, central nervous system, cognitive and musculoskeletal. Degenerative processes in the sensory system, motor, and muscle strength will have an impact on the ability to maintain body balance. Falls is an incident reported by a patient or eyewitness who sees an event that causes the elderly to be suddenly lying on the floor or lower ground, with or without loss of consciousness or injury. Falls can have a serious impact in the form of a groin fracture and soft tissue injury, but the fear of falling in the elderly can also affect the limitation of activity so that there is a decrease in their postural balance.

Postural balance is a motor skill carried out by the neuromuscular system that integrates with the sensory, cerebellar and brain systems. Information about the body’s position in regard to the environment or gravity is introduced by the visual, vestibular and proprioceptive systems. The central nervous system is useful for modifying motor and sensory components so that stability can be maintained through changing conditions. Balance can be assessed using the Berg (Berg Balance Scale) balance scale, which is a scale with specificity of the challenge of the elderly in maintaining balance. This test is quite easy to use and effective for predicting falls and disturbances in the postural balance of the elderly.
Optimizing the physical abilities of the elderly in activities can be honed by providing an exercise that emphasizes increasing postural stability. Some physical exercises that have been applied to provide changes to balance from various studies include tai chi, qi gong, Wii balance and other forms of occupational therapy. Physical exercise in the elderly must be individual and includes specifications in the form of frequency, intensity, duration, exercise mode based on the results of exercise testing and various limitations mainly related to the musculoskeletal system. Recommendations from the American Heart Association are at least three times a week with duration of 30 minutes. The purpose of this study was to evaluate the effect of balance exercise on postural balance in the elderly for falls prevention.

Method

The type of research was quasi-experimental with a pre-/post-test design research involving treatment groups and control groups. The population in this study was all elderly people who resided at the Wana Seraya Tresna Werdha Social Institution (PSTW) Denpasar, namely 47 elderly who have a history of falls more than once a year. This study uses a simple random sampling technique that involves 28 elderly people. The independent variable in this study was balanced exercise. Balance exercise is taught three times a week for two weeks with a duration of 30 minutes only for the treatment group. The dependent variable in this study was postural balance in the elderly. This study uses the Berg Balance Scale as a measurement tool to evaluate the development of the ability of the elderly to maintain postural balance. Berg Balance Scale will show changes in postural balance in the elderly between before and after intervention through 14 items of balance assessment. Scores 41-56 are included in the independent category, the score of 21-40 includes the walking with assistance category, and the score 0-20 is included in the wheelchair category. Statistical tests were performed using the Wilcoxon Signed-Rank Test and Mann Whitney Test with a significance level of $\alpha \leq 0.05$.

Result

Characteristics: Respondents in this study were 28 elderly in the age range between 60 - 89 years, most of them were female. All respondents had a history of falls in the last one year.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Age (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-74</td>
<td>6</td>
<td>42.9</td>
</tr>
<tr>
<td>75-89</td>
<td>8</td>
<td>57.1</td>
</tr>
<tr>
<td>&gt;90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>78.6</td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>21.4</td>
</tr>
<tr>
<td>Medical History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History has fallen in the past year</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stroke</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Heart failure</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>6</td>
<td>42.8</td>
</tr>
<tr>
<td>Cataract</td>
<td>5</td>
<td>35.7</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>1</td>
<td>7.14</td>
</tr>
<tr>
<td>Medication history</td>
<td>9</td>
<td>64.28</td>
</tr>
</tbody>
</table>

The medical history of the respondents was found to be mostly experienced by osteoarthritis. Only one respondent had a history of stroke. Medication history of the elderly found use of multivitamins, analgesics, and anti-allergic drugs.

Postural Balance: Table 2 shows that all treatment group respondents experienced an increase in the balance after the balance exercise intervention. The Berg Balance Scale score of the treatment group increased to a minimum score of 43 and a maximum score of 48. The respondents in the walking with assistance category had a score range between 31-39 while the independent category had a score range of 41-48.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>45</td>
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</tbody>
</table>
Conted…

<table>
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<th></th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tr>
<td></td>
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<td>42</td>
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<td>38</td>
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<td>48</td>
<td>45</td>
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<td>42</td>
<td>34</td>
<td>39</td>
<td>38</td>
<td>37</td>
<td>40</td>
<td>36</td>
</tr>
</tbody>
</table>

Wilcoxon Signed-Rank Test | 0.014 | 1.000
Mann Whitney | 0.001

Control group respondents were measured using the results of respondents experiencing a slight increase in scores, from a minimum score to 34 and a maximum score of 42. Only one respondent in the control group was independent. The respondents in the walking with assistance category control group had a score range of 34-40 and independent had a score of 42. As regard the increase in the treatment group category, as many as six respondents showed a significant change while the control group had no respondents who experienced a change in category. Based on the results of the analysis of the treatment group using the Wilcoxon Signed-Rank Test, the value of p = 0.014, less than α (≤0.05), showed that there was a significant effect on the treatment group from before to after the balancing exercise was given. The same analysis was also conducted on the control group with the results of p = 1.000 over α (≤0.05) indicating no influence between before and after the study. The Mann Whitney Test results compared the Berg Balance Scale score between the treatment and control groups after the intervention and found a p = 0.001 less than α (≤0.05). This value indicates that there are significant differences between the two groups so that it can be concluded that the hypothesis (H1) is accepted, namely balance exercise can improve postural balance in the elderly at Wana Seraya Tresna Wredha (PSTW) Denpasar.

Discussion

Before the intervention of balance exercise, a total of 10 respondents of the treatment group walking with assistance category found it difficult to do some movement in the valuation, among others, stand on one leg, placing foot alternately on the bench and taking the goods from the floor. The minimum score of the treatment group is 25 and the maximum score is 43. After the same measurement of the control group, a total of 13 respondents walking with assistance had difficulty doing standing movements on one leg, placing their feet alternately on the bench and taking items from the floor. The minimum score of the control group is 33 and the maximum score is 42.

After looking at demographic data and medical history, a number of supporting factors were found for these conditions: respondents have female gender, over the age of 80 years, have a history of repeated falls, a history of osteoarthritis with recurring pain, a history of very minimal physical activity, medication history pain and vitamin relievers and low index bark. Some of these conditions greatly affect the ability of the elderly to get a good postural balance. This statement is supported by previous research conducted by Dunn (2009) that changes in various body systems due to increasing age will greatly influence the ability of postural control as an ‘age effect’. Postural balance and control are influenced by previous life history and the effect of overall aging. The elderly with balance disorders have a risk of falling by 2.2 times compared to the elderly without balance disorders.

The measurement results of balance in the treatment groups showed as many as six categories of respondents increased the balance of walking with assistance or became independent and eight other respondents did not experience an increase in the category and no respondents experienced a decrease in the category. Some movements that are difficult to do, such as standing on one leg, placing the legs alternately on the floor and taking items from the floor were able to be done well by the respondents of the treatment group so that there was an increase in the scores of the assessment items.

Some of the initial movements which had been difficult for the treatment group respondents to do, such as placing their legs alternately on their backs, after the intervention the movement was able to be done well because the intervention was carried out optimally. This statement is supported by Jones and Barker (2005) who found that the balance exercise movement in the form of knee flexion and hip flexion can make respondents maintain that position because it can train the ventral and medial thighs, dorsal hip muscles, and inner and surface dorsal pedis muscles because, when lifting one leg, it requires coordination of these muscles.

The elderly have postural balance and control are influenced by previous life history and the effect of overall aging. The elderly with balance disorders have a risk of falling by 2.2 times compared to the elderly without balance disorders.
Standing on one leg movement, in general, was still difficult for the control and treatment groups. Respondents who were not able to do the movement well had the minimal ability when making modifications without holding onto the chair during knee flexion, hip flexion, hip extension, and single leg side movements. Balance exercise was able to improve the postural control ability of the elderly as evidenced by the increase in scores in other movements, such as sitting to stand, standing without support, sitting without support and looking back.

A good postural balance can improve the ability of the elderly to prevent falls. Exercises given to improve postural balance must pay attention to the readiness of the elderly in the exercise. Balance exercise will help the elderly to gradually increase physical alertness so that they remain active by providing wider physiological contact so as not to be isolated from stimuli and prevent injuries. Balance exercise involves good integration between the central nervous system, peripheral nervous system, and musculoskeletal system, especially the lower extremities, and can increase the ability of the elderly to control changes in body position that can occur at any time. The stages of balance exercise movements such as plantar flexion, knee flexion, hip flexion, hip extension and single leg side involving a group of lower limb muscles, have an impact on increasing muscle strength so that falls in the elderly can be prevented. This shows that the elderly need continuous stimulation in order to remain active despite increasing age.

**Conclusion**

Based on the discussion above, the conclusion of this study is that balance exercise can improve postural balance in the elderly through plantar flexion, knee flexion, hip flexion, hip extension and single leg side movements, which can stimulate the ability of the elderly to maintain postural balance.

**Ethical Clearance:** This research has been declared ethically feasible by the Medical Research Ethics Commission (KEPK) Faculty of Medicine, Universitas Airlangga Surabaya, Number 394/EC/KEPK/FKUA/2016.

**Source of Funding:** This study has not received funding support from any institution

**Conflict of Interest:** None

**REFERENCE**


Contributing Factors of the Mother’s Behavior in Filling Nutritional Needs for Under-Five Children with Overweight and Obesity

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ABSTRACT

Overweight and obesity in children are still a global problem. The problem of overweight and obesity in under-five children can have a bad impact on growth and development. Nutritional problems in children are influenced by mothers’ feeding behavior. This study aims to analyze the factors that influence the behavior of mothers in fulfilling nutrition for under-five children with overweight and obesity. The design used was a cross-sectional approach. The population was mothers who have under-five children with overweight and obesity. The sample was determined using purposive sampling and found 40 respondents. The independent variables in this study were previous behavior, perceived benefits, perceived barriers, self-confidence, attitudes and commitment, while the dependent variable was the behavior of mothers in fulfilling the nutrition of under-five children. The data were collected by using questionnaire and analyzed by using Spearman’s Rho. The results of this study indicate that the behavior of fulfilling the nutritional needs of overweight and obesity children was influenced by the perceived benefits (r = 0.701, p = 0.000), perceived barriers (r=0.488, p=0.001), attitudes (r=0.640, p=0.000) and commitment (r=0.637, p=0.000). Further research is recommended to provide effective health education to prevent overweight and obesity in under-five children.

Keywords: maternal, midwife, nurse, referral hospital

Introduction

Overweight and obesity are health problems needed to be aware of at the world level, including Indonesia.¹ Globally, over 40 million of under-five children are estimated as overweight and obese, of whom about 30 million live in developing countries.² Under-five children who are overweight have high risk of obesity in adulthood and have the potential to experience metabolic diseases and degenerative diseases in old age.³,⁴

The nutritional status of children under five is influenced by food intake which is indirectly influenced by several factors, including the characteristics or behavior of the children’s mother. Mothers as the closest people to under-five children who have a role in the process of child development through the selection of nutritious food ingredients and can arrange a balanced food menu according to the needs.⁵ Balanced food arrangements can guarantee the fulfillment of nutritional needs for toddlers appropriately.⁵

Obesity that occurs in under-five children can be caused due to unhealthy eating patterns, because toddlers generally have a large amount of food, various types of food consumed, do not have a regular eating schedule, parents’ socioeconomic status can have a tendency to lead to wrong eating patterns, and lack of attention from parents can have an impact on uncontrolled toddler nutrition.⁷,⁸ The government is focused on the problem of malnutrition compared to the problem of excess nutrition, although both of these are problems that are occurring in Indonesia. Double Nutrition Load (BGG) is a phenomenon that has occurred in several developing countries, including Indonesia. In Indonesia there is an overweight prevalence of 11.9%, whereas in East Java in 2012, 10.6% of children under five were overweight.⁹,¹⁰
Pender’s Health Promotion Model is a theoretical perspective that explores factors related to health promotion behavior that aim to improve health and quality of life. Setting a diet, includes ensuring the adequacy of balanced nutrition, has been recommended by experts to avoid the risk of obesity in children under five. In addition to regulating diet, getting children to stay physically active through various sports or playing activities can also reduce the risk of obesity. This study aims to analyze factors related to mothers’ behavior in fulfilling nutrition for under-five children with overweight status and obesity.

Method

Study Design, Setting, and Sampling: Design used in this study was observational analytic with a cross-sectional approach. The population was mothers who have under-five children with overweight and obesity in Kediri districts. The sampling technique used was purposive sampling and found a sample size of 40 mothers from public health centre (PUSKESMAS). The questionnaire used to measure mother’s behavior and independent variables consisting of previous maternal behavior, perceived benefits, perceived barriers, self-confidence and attitude was compiled by researchers based on a modification of the parameters of nutritional fulfillment behavior and the health promotion model theory, while the questionnaire used to measure mothers commitment was modified based on parameters of maternal behavior in preventing nutritional problems in under-five children and the health promotion model. Before collecting the data using this questionnaire, the researcher tested the validity and reliability, which shows that the entire questionnaire are valid and reliable.

Study Variables: The dependent variable in this study is the behavior of mothers in fulfilling the nutritional needs of under-five children with overweight status and obesity. The independent variables in this study include:

1. Previous maternal behavior
2. Perceived benefits
3. Perceived barriers
4. Self-confidence
5. Attitudes related to maternal actions
6. Commitment in fulfilling nutrition for under-five children

Data Analysis: The data obtained were analyzed by researchers using Spearmans Rho with α=0.05 to find out variables related to nutritional fulfillment behavior.

Results

The characteristics of the respondents indicated that the highest maternal age was in the age range of 26-30 years, 17 (42.5%) respondents. More than half of the respondents did not work, 24 (60%). Respondents in this study had the level of education in senior high school as many as 23 (57.5%) respondents. More than half of the respondents, namely 25 (62.5%), had a high income economy level. As regard characteristics of respondents seen from the age of the child, most children were aged between 3-5 years, as many as 32 (80%) (Table 1).

Table 1: Characteristics of Respondents (n = 40)

<table>
<thead>
<tr>
<th>Characteristics Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-25 years old</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>26-30 years old</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>31-35 years old</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>36-40 years old</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>41-45 years old</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>Working Mother</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Junior high school</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>Senior high school</td>
<td>23</td>
<td>57.5</td>
</tr>
<tr>
<td>Higher education</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Family Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>High income</td>
<td>25</td>
<td>62.5</td>
</tr>
<tr>
<td>Child Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3 years old</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>3-5 years old</td>
<td>32</td>
<td>80</td>
</tr>
</tbody>
</table>

Based on Table 2, the results of the statistical test, Spearman rank correlation coefficient, show the value of r = 0.186 and the significance value of p = 0.251, which means there is no relationship between behavior and previous experience. The results of statistical tests using Spearman Rho showed a significant relationship...
between the benefits felt by the behavior of fulfilling nutritional needs with the value of \( p = 0.000 \) and the perceived benefits were strong and in line with nutritional fulfillment behavior in children with \( r = 0.701 \).

The results of the statistical tests showed a significant relationship between the perceived barriers to the behavior of fulfilling nutritional needs in infants with overnutrition and obesity with a value of \( p = 0.001 \) and a value of \( r = 0.488 \). The results of the statistical test of the relationship between self-confidence and the behavior of fulfilling nutritional needs for children with overweight and obesity showed no significant correlation, with the value of \( p = 0.350 \) and \( r = -0.152 \)

### Table 2: The relationship of contributing factors with mothers’ behavior (n = 40)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mother’s Behavior</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Previous experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have previous experience</td>
<td>12 (30)</td>
<td>12 (30)</td>
<td>0.251</td>
</tr>
<tr>
<td>Have no previous experience</td>
<td>5 (12.5)</td>
<td>11 (27.5)</td>
<td></td>
</tr>
<tr>
<td>Perceived benefits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>15 (37.5)</td>
<td>4 (10)</td>
<td>0.000</td>
</tr>
<tr>
<td>Positive</td>
<td>2 (5)</td>
<td>19 (47.5)</td>
<td></td>
</tr>
<tr>
<td>Perceived barriers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any barriers</td>
<td>12 (30)</td>
<td>5 (12.5)</td>
<td>0.001</td>
</tr>
<tr>
<td>No barriers</td>
<td>5 (12.5)</td>
<td>18 (45)</td>
<td></td>
</tr>
<tr>
<td>Self confidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>7 (17.5)</td>
<td>13 (32.5)</td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>10 (25)</td>
<td>10 (25)</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>13 (32.5)</td>
<td>3 (7.5)</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>4 (10)</td>
<td>20 (50)</td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>16 (40)</td>
<td>7 (17)</td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>1 (2.5)</td>
<td>16 (40)</td>
<td></td>
</tr>
</tbody>
</table>

### Discussion

No significant relationship was found between previous experience and behavioral fulfillment. Behavior and prior experience are the frequency of the same health behavior in the past.\(^{12}\) This is not in line with the findings previous study which states that one of the factors influencing the fulfillment of nutritional needs is previous experience.\(^{17}\) The results show that there were some respondents who did not have experience because their children were the first child so that the respondent had no experience in meeting the nutritional needs of the family. Family income can also influence the choice of food types to meet under-five children’s nutrition.\(^{18}\) Under-five children who are overweight and obese tend to have high income parents who can allow children to consume foods that are favored by the child, so they can increase high nutritional intake. Some respondents with poor behavior in fulfilling nutrition were respondents having a low family income.

There was a strong relationship between perceived benefit and the nutritional fulfillment behavior of infants. Perceived benefits are perceptions of benefits or benefits that can strengthen individuals to perform a health behavior.\(^{12}\) The benefits can directly motivate a behavior; a good parent’s knowledge of the benefits can be a motivation for them to provide food with the right quality.\(^{19}\) Knowledge of parents related to the level of education, mothers having a positive perception of the benefits in meeting nutritional needs and good behavior were respondents with high education.\(^{20}\)
This study shows that perceived barriers also have a strong influence. If someone does not have barriers from the action taken, then that person will have good health behavior.\textsuperscript{12} Parents with children with overweight and obesity have good knowledge about the benefits of fulfilling the right nutritional needs, but there are perceived barriers of behavior with appropriate nutrition; parents are preoccupied with daily activities so tend to provide food to children only with the aim to eliminate hunger by serving it quickly and easily without regard to the nutritional content.\textsuperscript{21} This is also related to parents’ self-confidence, which, in this study, does not have an influence on the behavior of fulfilling the nutritional needs of children with overweight and obesity. This result is not in line with research that states that, with strong self-confidence, a person will feel able to perform certain health behaviors so that the desire to behave will be stronger.\textsuperscript{16} According to the theory, self-confidence is a belief from within a person to be able to do good health behavior, related to how parents believe that they are able to have a good influence on fulfilling their children’s nutritional needs.\textsuperscript{21,22} Parents who have positive self-confidence do not necessarily have good behavior to fulfill children’s nutritional needs, according to the results of previous studies. This tends to be caused by a time when parents cannot control the food consumed by children, for example, the influence of advertising on television and factors sourced from children who tend to prefer foods that are interesting and tasty compared to the nutritional value contained in the food consumed.\textsuperscript{23} According to the answers given by respondents, mothers believe they are able to choose nutritious foods to be consumed by children every day; however, mothers also stated that they often allow children to consume snacks that children like, such as fast food.

There is a strong relationship between attitudes in fulfilling nutrition with nutrition fulfillment behaviors in under-five children and the majority of respondents had a positive attitude. The more positive the attitude, the better the behavior.\textsuperscript{12} Respondents having a positive attitude and good behavior are respondents who had a higher education, because the individual’s attitudes are related to knowledge and education possessed. A positive attitude will shape the behavior of fulfilling nutritional needs in a good category. Parents with children who are obese have the attitude or intention to provide good quality nutrition, this is manifested by the behavior of giving healthy food too, but, in reality, there are many barriers that also influence the behavior of healthy feeding, causing children to be obese or overweight.\textsuperscript{19,24} There is a strong relationship between commitment in fulfilling nutrition and nutritional fulfillment behavior in infants. Commitment is the desire to carry out certain health behaviors, including the identification of strategies to do it well.\textsuperscript{12} The intention to behave (commitment) is a desire or plan that will be carried out.\textsuperscript{25} Mothers who had weak commitments had bad behavior. The results of the research that have been carried out are in line with the results of study stating that commitment is related to the behavior of fulfilling nutritional needs.\textsuperscript{16}

**Conclusion**

Mother’s behavior in fulfilling nutritional needs of under-five children with overweight and obesity is influenced by several factors, namely perceived benefits, perceived barriers, self-confidence, attitudes and commitment to meet nutritional needs, while previous experience and self-belief of mothers have no influence on mother’s behavior in fulfilling children’s nutritional needs. The most powerful factor in influencing this is the perceived benefit.

**Ethical Clearance:** This research has received ethical approval conducted by the Nursing Faculty of Airlangga University.

**Source of Funding:** This study was independently funded.

**Conflict of Interest:** None

**REFERENCES**


Commitment for Anaemia Prevention is Associated with Adherence to Iron Supplementation and Iron Intake Among Pregnant Women

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¹Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT
Anaemia during pregnancy is still a major problem in the world which can affect the health of the mother and foetus. The commitment of pregnant women to improve adherence to iron supplementation and eating iron-rich foods can prevent iron deficiency anaemia. This study aimed to identify the correlation between of commitment for anaemia prevention with adherence to iron supplementation and iron intake. Design: The study was a cross-sectional study with a population sample of 125 pregnant women who attended antenatal care at five community health centres in Surabaya. The study was conducted from August to October 2017. The statistical test results showed the commitment statements, “I maintain personal hygiene by frequently washing hands” had the highest score (4.38 ± 0.67) and “I take iron supplements regularly even if it causes nausea” had the lowest score (4.05 ± 0.84). Of the four statements about adherence to iron supplementation, “I take iron supplements regularly every day” had the highest score (4.35 ± 0.86) while ‘I take iron supplements along with orange juice or vitamin C drinks’ had the lowest score of 1.52 ± 0.87. There was a significant association between commitment for anaemia prevention and adherence to iron supplementation during pregnancy (r = 0.227; p = 0.011) and between commitment for anaemia prevention and iron intake (r = 0.432; p <0.001). Health workers need to conduct health education about the prevention of anaemia in every pregnant woman who attends antenatal care.

Keywords: Commitment, Anaemia prevention, Adherence Iron Supplementation, Iron Intake

Introduction
Iron deficiency, or as commonly known as anaemia, in pregnant women is still a major nutritional issue, mostly in low and middle income countries. According to world health organization, anaemia is considered to be a huge public health challenge as population studies find that anaemia prevalence is at 5.0% or higher. Prevalence of anaemia ≥40% in a population is classified as a severe public health problem by the World Health Organization.¹ The prevalence of anaemia was 18.0% in Northern Tanzania.² According to Indonesia basic health research in 2018, 48.9% of pregnant women were anaemic.³

Anaemia, during pregnancy can adversely affect the mother and foetus, resulting to especially premature birth and low birth weight.⁴ Anaemia can be prevented through giving iron supplements, education about possible dangers of anaemia, taking foods that have high contents of iron, increased consumption of dairy foods, and eating a wide variety of foods that have vitamins that can increase iron level, such as vitamin C, and prevention of infectious diseases such as tuberculosis.⁵

During pregnancy, the mother will experience a physiological process in which there is an increased need for iron supply. To meet the need for this component, it is necessary to increase intake of food high in iron to boost the iron reserve in the body. The iron requirement for pregnant women is not sufficiently met by only taking iron-rich food, rather it requires iron supplementing to meet the required level.⁶ Previous research shows that using iron supplements will increase haemoglobin levels and prevent anaemia in pregnant women.⁷–⁹
Nutritious foods that can be taken to prevent anaemia include energy-rich foods such as carbohydrates, proteins and vitamin C. A study showed that there is a significant correlation between nutrients and haemoglobin levels. Women with anaemia show a low-energy diet deficiency, protein, folate, vitamin B12, iron-rich diet, vitamin C and red meat.10

The regular intake of iron supplement is an important effort in the prevention of anaemia. The composition of each iron supplement for women of childbearing age and pregnant women, should contain at least 60 mg of iron, in the form of Ferro Sulphate, Ferro Fumarate or Ferro Gluconate, and 0.400 mg of folic acid.11 According to Indonesia Basic Health Research in 2018, only 61.9% of pregnant women consume at least 90 iron supplements during pregnancy.3 Non-adherence to consumption of iron supplements is caused by the perceived side effects.12

According to the Health Promotion Model, commitment is defined as an intention to perform certain health practices, such as identification of strategies to conduct health promotion behaviour.13 Health workers need to provide health education and identify patient strategies in dealing with problems in performing health behaviours. Study supports the importance of commitment to compliance with health behaviours. There is a relationship between commitment and compliance in diabetic patients.14

The commitment to take iron supplements and dietary iron intake needs to be researched further because of many obstacles and side effects, such as boredom and forgetfulness. Currently, there is still limited research about the commitment for anaemia prevention during pregnancy. The aim of this research is to identify the correlation between commitment for anaemia prevention with adherence to iron supplementation and iron intake.

Method

Study Design, Setting, and Sampling: This study used a cross-sectional design conducted in August-October 2017 on 130 pregnant women. The population of this study was the pregnant women who attended antenatal care at five community health centres in the Surabaya, namely, Jagir, Medokan Ayu, Sidotopo Wetan, Asemrowo and Gundih. The size of the sample meeting the criteria was 125 pregnant women. The inclusion criterion was pregnant women having obtained iron tablets from the Community Health Centre. Exclusion criterion was pregnant women having complications that require medical action.15

Data Analysis: Spearman’s Rho was used to determine the correlation between commitment for anaemia prevention with adherence to iron supplementation and dietary iron intake. In all statistical analyses, a p-value <0.05 was considered significant.

Results

More than half of the participants were aged 25-35 years (n=80, 64.0%). Most of them (n = 89, 71.2%) with parity 1-3. More than half of the participants (n = 98, 78.4%) had secondary education. In addition two-thirds of the participants (n = 87, 69.2%) had incomes below 3 million rupiahs per month. The greatest iron intake was in age < 25 years (76.68 ± 31.12), nullipara (72.29 ± 18.79), university education (71.34 ± 15.47), and income was ≥ 3 million rupiah (63.92 ± 26.77) (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (%)</th>
<th>Iron (mg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25 years</td>
<td>32 (25.6)</td>
<td>76.68</td>
</tr>
<tr>
<td>25-35 years</td>
<td>80 (64.0)</td>
<td>57.77</td>
</tr>
<tr>
<td>&gt; 35 years</td>
<td>13 (10.4)</td>
<td>69.53</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>34 (27.2)</td>
<td>72.29</td>
</tr>
<tr>
<td>1-3</td>
<td>89 (71.2)</td>
<td>60.78</td>
</tr>
<tr>
<td>&gt; 3</td>
<td>2 (1.6)</td>
<td>31.80</td>
</tr>
</tbody>
</table>

Table 1: Socio-demographic characteristics and dietary iron intake in pregnant mothers
Of the commitment statements, “I maintain personal hygiene by frequently washing hands” had the highest score (4.38 ± 0.67) and “I consume iron tablets regularly even if it causes nausea” had the lowest score 4.05 ± 0.84 (Table 2).

### Table 2: Item analysis of commitment to iron supplementation

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Mean±</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I consume nutritious food even though it requires more time to prepare</td>
<td>4.28</td>
<td>0.62</td>
</tr>
<tr>
<td>2.</td>
<td>I consume nutritious food even though I need more funds</td>
<td>4.18</td>
<td>0.64</td>
</tr>
<tr>
<td>3.</td>
<td>I consume iron tablets regularly even if it causes nausea</td>
<td>4.05</td>
<td>0.84</td>
</tr>
<tr>
<td>4.</td>
<td>I take iron supplementation properly</td>
<td>4.32</td>
<td>0.56</td>
</tr>
<tr>
<td>5.</td>
<td>I maintain personal hygiene by frequently washing hands</td>
<td>4.38</td>
<td>0.67</td>
</tr>
<tr>
<td>6.</td>
<td>I always use footwear when going out</td>
<td>4.22</td>
<td>0.80</td>
</tr>
<tr>
<td>7.</td>
<td>I have a special time to prepare nutritious food</td>
<td>4.09</td>
<td>0.73</td>
</tr>
<tr>
<td>8.</td>
<td>I have a variety of daily diet so as not to get bored</td>
<td>4.23</td>
<td>0.69</td>
</tr>
<tr>
<td>9.</td>
<td>I put iron tablets in a place that is easily visible to avoid forgetting</td>
<td>4.21</td>
<td>0.71</td>
</tr>
<tr>
<td>10.</td>
<td>I took an iron tablet at the time recommended by health personnel</td>
<td>4.37</td>
<td>0.67</td>
</tr>
</tbody>
</table>

The mean score of commitment was 25.80 (95% CI 25.36-26.24). The mean score of adherence to iron supplementation was 17.38 (95% CI 16.99-17.78). There was a significant association of commitment with adherence to iron supplementation (r = 0.227; p = 0.011). The mean score of iron intake was 63.45mg/day (95% CI 58.03-68.86). There was a significant association of commitment with iron intake (r = 0.432; p < 0.001) (Table 4).
Discussion

This study shows that there was a significant association of commitment for anaemia prevention with adherence to iron supplementation. Commitment is the intention to carry out certain health behaviours, such as the identification of strategies to promote health promotion behaviour. A commitment will encourage individuals to engage in health behaviours despite the obstacles encountered. A study showed that there is a correlation between commitment and physical activity behaviour in mothers and young children with low-income. Commitment is required for healthy eating behaviour in male and female students in Nigeria. Of the five commitment statements, “My family needs to know that I have a commitment to prevent anaemia during pregnancy” had the highest score. Support from the family is very important because, during pregnancy, the mother will experience physical and psychological changes. This condition can be a burden that requires the support of others. Study shows that physical problems experienced due to nausea and vomiting cause weaknesses and helplessness in pregnant women, necessitating the husband’s support. Health education about iron supplement provided by health workers has not involved family members and, therefore, families do not understand the importance of iron supplements properly. This is supported by related research that established the knowledge of pregnant women needs to be improved through the provision of health education during antenatal care accompanied by husbands to improve their understanding of anaemia and compliance by taking iron tablets.

The statement “I put iron supplementation in a place easily visible to avoid forgetting” had the lowest score. Many pregnant women do not take iron supplementation regularly because they forget. Most of the pregnant women understand the importance of taking iron supplements regularly, but require more information about drinking properly. There are many obstacles that pregnant women will experience in taking iron supplements, such as side effects, forgetfulness and boredom. This is supported by research that the two main causes of maternal disobedience are side effects and forgetfulness. A study has shown several factors affect the consumption of iron tablets. Adherence to iron supplementation among pregnant women in Surabaya is influenced by perceived benefits, barriers and family support.

The adequacy of iron during pregnancy is influenced by adherence to iron supplementation. Iron requirements increase during pregnancy and cannot be fulfilled only through iron-rich foods, so the mother needs to take iron tablets regularly. Each iron supplement for pregnant women should contain iron at least equivalent to 60mg of iron elements. Adequacy of iron needs to be fulfilled through iron-rich foods and adherence to iron supplementation. The obstacle perceived by pregnant women to fulfil food is the lack of information about iron-rich foods and food prices. Adherence to iron supplementation can decrease because of side effects, and forgetting to take it regularly.

Commitment is the intention to carry out certain health behaviours, including the identification of strategies to be able to conduct good health promotion behaviour. Commitment will encourage individuals to carry out health behaviours despite obstacles encountered. Pregnant women who are committed to prevention of anaemia will make efforts to increase consumption of iron-rich foods and adhere to iron supplements despite various obstacles.

Conclusion

There is a significant correlation between commitment, adherence to iron supplementation and iron intake. Health workers need to conduct health education on adherence to iron supplementation in pregnant women and the problems encountered by pregnant women. Understanding the problems to face will make pregnant women strategise appropriately in improving adherence to iron supplementation and improving iron adequacy.

Ethical Clearance: Sampling was conducted after ethical approval from the health research ethics committee of the Faculty of Public Health, Airlangga University in Surabaya (No 123-KEPK).


Conflict of Interest: None

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How Do I Fulfill My Nutrition: The Experience of Older Adults Who Live Alone

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ABSTRACT

The barriers to living alone get bigger when older adults get older. One of them is being unable to fulfill their nutritional needs. Older adults who live alone must be able to fulfill nutritional needs, personal hygiene and health independently. This research was conducted to describe experience of older adults who live alone to fulfill their nutritional needs in Magetan, East Java. The methodology employed was a phenomenological qualitative design. We conducted in-depth interviews with seven older adults who live alone. The data were analyzed using thematic content analysis. Six themes emerged as the strategy to get ingredient and food were cooked by self, bought from the seller, collected from farm; the barriers to fulfilling nutritional needs were getting old, disease and financial insufficiency. To fulfill the nutritional needs is a challenge for older adults, especially when they get sick. So, they need support from family, neighbors, and government to overcome the barrier. It is expected to be a consideration in policies regarding monitoring programs of the condition of older adults who live alone.

Keywords: nutritional need, food, barriers, live alone, older adults

Introduction

The older adults enjoy their old days with their family, but, in certain circumstances and for certain reasons, they decide to live alone.¹ An older adult who lives alone must fulfill their nutritional needs independently. Based on a study in Indonesia, intake of malnutrition was more common in older adult aged 70 years who lived alone. In addition, the incidence of malnutrition is quite high in older adults in rural areas because the diet is unsuitable to the needs.²

The decision of older adults to live alone can come from themselves or because the family does not want to take care of them. Factors that affect older adults in living alone are cultural factors, family background, and personality. Indonesian cultures adheres to a social system that is collective in nature and most still adhere to the extended family system, which is one house consists of several nuclear families including grandparents. So, it is common for an older adult to live with their family.³ Conflict in the family can also be a reason for older adults to live alone. In addition, there are older adults who want to be independent, actively establish communication with their neighbors, be free to do activities, and do not want to burden their families. However, there are consequences of problems that can affect older adults who choose to live alone, such as the problem of meeting adequate nutritional needs.⁴

Research on older adults who living alone has been done, but there has been no in-depth research on the experience of older adults who live alone in fulfilling nutritional needs. As such, the researchers are interested in using qualitative research methods with phenomenological designs to explore the barrier to fulfill nutrition for the elderly who live alone in Magetan, Indonesia.

Method

Study Design, Participants and Sampling: This study employed a qualitative design with a phenomenological approach. This approach allowed the researcher to probe the barriers experienced by the older adults when fulfilling their nutritional needs. The researcher selected

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the participants through purposive sampling among the older adults who live alone in Magetan, East Java, Indonesia. Snowball sampling was used in this research. Older adults who were known by the researcher were approached. Then, they recommended others older adults as potential participants. The inclusion criteria were: 1) lived alone without family or partners, 2) had good cognitive function (Short Portable Mental Status Questionnaire score within 0-2), 3) able to read and write and 4) agree to share and speak about their experiences. The recruitment was discontinued when the data saturation was determined by the seventh participant.

Procedure: The interviews were scheduled at the participants’ homes at a convenient date and time, involving both the older adults and the researcher. After an explanation about the research process and giving signed consent, the participants were asked demographic questions and screened for nutritional status with Mini Nutritional Assessment (MNA). Then, an in-depth interview with older adults using four open-ended questions (with additional questions if necessary) was conducted to explore the experience of older adults to fulfill their nutritional needs. The interview process was 15 – 45 minutes and recorded.

Measures: A series of open-ended questions for the older adults was developed to let the participants tell their experience when fulfilling their nutritional needs. The interview questions were designed based on previous research on fulfilling nutritional needs for older adults. In addition, the empirical knowledge of the writer about the older adults and their nutritional needs was used when created the questions. A demographic questionnaire (created by the author) was used to obtain basic demographic information (e.g. gender, occupation, income, age, education, etc.). The following questions were conducted during interviews: “What do you think about fulfilling nutritional needs?” “Please tell me how was your experience when fulfilling nutritional needs while living alone?” “What were the barriers that you encountered when fulfilling nutritional needs while living alone?”

Data Analysis: The data were analyzed and interpreted using the Colaizzi method. This method allow data to be clarified with participants, as well as possible changes in the results. A summary of the process of data analysis is as follows. Step 1: describe the phenomenon of study. The researchers increased the knowledge of “the older adults who lived alone and how they fulfill nutritional needs” through reading research articles and books. Step 2: collect the phenomenon through the participants’ opinions verbatim. Step 3: read the whole phenomenon collected from the participants. The verbatim script was synchronized between the sound recording and field notes. Step 4: sort the significant statements. The researcher coded the participant statements that had a significant meaning as listed verbatim. Step 5: formulate the meaning of each significant statement. The researchers fully used the participants’ point of view and put aside all assumptions of the researcher. Step 6: categorize each unit of meaning into a theme. Step 7: integrate each theme into a complete description. Step 8: validate the results of the analysis with the participants. We allowed the participant to read the verbatim transcript and validate the meaning. Step 9: refine the analysis results with the data obtained during the validation process.

The author involved two colleagues for an external finding validation, discussed the different perspectives, and clarified any “bias of researchers” that may have influenced the process of data interpretation. In addition, to minimize the researcher bias, the researchers wrote a reflective diary. The reflective diary was used to write down the author’s thoughts, feelings, and perceptions about “fulfilling nutritional need for older adult” when conducting the research. This allowed the researchers to re-examine their position when problems arose.

Results

A summary table of the characteristic of participants is included in Table 1. All participants were older adult females who lived alone.

Table 1: The characteristic of the older adults

<table>
<thead>
<tr>
<th>No.</th>
<th>Categorized</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mean of Age (years)</td>
<td>63.57</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than junior high school</td>
<td>6</td>
<td>85.71</td>
</tr>
<tr>
<td></td>
<td>Completed junior high school</td>
<td>1</td>
<td>14.29</td>
</tr>
<tr>
<td>3</td>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>2</td>
<td>28.57</td>
</tr>
<tr>
<td></td>
<td>Laborer</td>
<td>4</td>
<td>57.14</td>
</tr>
<tr>
<td></td>
<td>Housewife</td>
<td>1</td>
<td>14.28</td>
</tr>
<tr>
<td>4</td>
<td>Income/month (Rupiahs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500.000 – 1.5 millions</td>
<td>7</td>
<td>100</td>
</tr>
</tbody>
</table>
The third subtheme “collect from farm” was described by participants:

“... the sweet potatoes are my own, I take them from the backyard garden. I usually collect pumpkins in the fields ...” (P4)

“I take the vegetables and fruit from the garden, for example papaya leaves or young papaya, there is also spinach, long bean leaves, I take all of the vegetables from the garden. In my backyard garden, there is also papaya, mango, banana, the banana on the table is also from the garden. I planted it myself, Miss.” (P6)

The barriers to fulfilling the nutritional needs: We conclude three subthemes as barriers in fulfilling the nutritional needs, such as getting older, disease and financial insufficiency. The first subtheme, “getting older”, was described by participants:

“Becoming older like me, it means health starts to decline. I have difficulty to fall sleep, even eating is hard for me. Doing everything is difficult.” (P3)

“I can’t eat, most of the food is hard to chew. I do not have teeth anymore, only two teeth (pointing to the teeth. So I mean I have to choose soft ones like tofu or vegetable like chayote” (P5)

The second barrier to fulfilling the nutritional needs is “disease” as described by participants:

“The difficulty is that, if uric acid is recurring, my left and right knee is rheumatic, the fingers also get sore. I can’t take water from the well. It is difficult for me. Moreover, if I have to cook or go to market, I can’t handle it. So I just buy food in the food stall in near my house.” (P2)

The third barrier to fulfilling the nutritional needs is “financial insufficiency” as described by participants:

“.. I eat whatever that is available, Miss, if I don’t have money, I eat two times per day or I fast on Monday and Thursday. Not bad, I can save my money. Understandably, I don’t have money, usually my child gives me money, not too much is given. Or income from selling vegetables in the garden.”(P6)

---

**Table 2: Themes of study**

<table>
<thead>
<tr>
<th>No.</th>
<th>Themes</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The strategy to get ingredients and food</td>
<td>Bought ingredients and food from the seller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collected from farm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooked by self</td>
</tr>
<tr>
<td>2.</td>
<td>The barriers to fulfilling the nutritional needs</td>
<td>Getting older</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial insufficiency</td>
</tr>
</tbody>
</table>

**The strategy to get ingredients and food:** We deduced that there were three subthemes to get ingredients and food, such as bought from the seller, collected from farm and cooked by self. The “bought from the seller” subtheme was described by participants:

“Sometimes I buy chicken or vegetables at the market, then ask someone to cook, a half kg of chicken can be two days, really. If I’m not feeling well, I buy food at a warung (food stand) near my house. “(Participant 2/P2)

“..Everything what I want to eat, I just buy, such as meatballs, tepo pecel (a kind of food), nasi campur (a kind of food).” (P3)

The second subthemes “cooked food by self” was describe by participants:

“I buy the seasonings, tofu, tempe (a kind of food made from fermented soybean) and vegetables in a shop near my house, Miss. I rarely buy food. I cook by myself, the taste is more suitable.”(P5)

“I cook every day, Miss, I never bought it. I save more money if I cook by myself.” (P1)
Discussion

Cooking is an activity to convert raw food ingredients into foods that are ready to eat, have quality, and are safe for consumption. The purpose of processing food ingredients is to reduce the risk of losing nutrients in food ingredients, increase digestibility, and maintain color, taste, tenderness, appearance of food, and being free from organisms or harmful substances to the body. This is supported by other study maintaining the cleanliness of food or drinks in the daily processes food by cooking it yourself and maintaining food quality more. The process of providing food starts with attention to the food ingredients to be chosen. Food ingredients need to be considered and selected as well as possible in terms of cleanliness, appearance, and health. Choosing materials that will be processed must involve knowing good food sources and paying attention to the characteristics of good food ingredients. The results of interview were obtained by processing food by other people. The older someone is can cause various disorders in fulfilling their daily needs, so can increase dependence on others. Declining physical abilities can affect older adults in cooking and preparing food.

The influence of the aging process can cause various problems, both physically, biologically, mentally, and socioeconomically. Older people will experience setbacks, especially in the field of physical ability. In addition, Maryam et al. (2011) explained tooth decay (toothlessness) will reduce the ability to digest food. In old age, permanent teeth become dry, more brittle, darker in color, and even some teeth have been dated.

The challenge to live alone is greater as people grow older. There are barriers to fulfilling daily needs, such as eating, bathing, etc. According to Maslow, older adults who live alone may be malnourished and lose weight because they cannot afford enough food, also they are too weak to prepare three meals per day. Some older people have no appetite because they are sick or lonely, and unable to get food regularly. In addition, there is a decrease in digestive function, depression, changes in economic condition, lack of knowledge about nutrition, physical inability, such as difficulty shopping and cooking, all of which may become a problem in fulfilling nutrition in older adults.

According to Miller (2012), depression and other cognitive decline can affect diet and ability to prepare food. There is a strong relationship between nutrition and low income. The decline of physical condition of older adults would cause a decline in the economic field. Economically, people who are more than 60 years old are no longer productive. Declining work ability means amount of income also decreases or even disappears altogether. This condition causes older adults to be often seen as a burden rather than as a resource.

Limitation of this study is that this research could not be generalized to a larger population because a different phenomenon might occur. However, this study is very important for the development of knowledge in fulfilling nutritional needs in older adults. This research can be used as a platform for policy makers, especially in Indonesia, to improve health services for older adults in the community.

Conclusion

The obstacles of older adults who live alone in fulfilling their dietary needs are old age, illness, and economic inadequacy. These obstacles must be overcome by involving cooperation from government, health workers and community. Community involvement in fulfilling nutritional needs of older adults is needed in the form of special attention and supervision by cadres in the older adult who lives alone. Health workers at the Puskesmas (Health Center Service) need to make home visits for older adults living alone. This activity will help to find out the nutritional status of the older adult, in addition to the regular program from the Posyandu (Self Health Service) for older adults. There needs to be real support from family members in the form of material and non-material assistance to support the needs of the older adult who lives alone.

Ethical Clearance: Research Ethics Committee of the Faculty of Nursing Universitas Airlangga gave Ethical Approval for this research with the number 929-KEPK before recruitment. Each participant was voluntary, proved by signing an informed consent, and gave a pseudonym.

Source of Funding: Self-funded.

Conflict of Interest: None
REFERENCES


Relationship between Personality Type and Family Support with Genital Hygiene Behavior in Adolescent Girl

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ABSTRACT

There are several factors that affect the genital hygiene behavior of adolescents, including personal and family support. The purpose of this study to explain whether there is a relationship between personality type and family support in the genital hygiene behavior of adolescent. This research used correlation research method with cross-sectional approach. The samples of the study were 116 respondents using random sampling technique. The data analysis used descriptive analysis of chi-square correlation test. This study found that most respondents had good family support and extrovert personality types with the same score of 60.2%, and most of the respondents had clean behavior in genital hygiene, as much as 71.2%. The chi-square correlation test results obtained p value = 0.076, which means there is no relation between personality type and genital hygiene behavior in adolescent girls, while the correlation test of family support with genital hygiene behavior on adolescent girls obtained p value = 0.036 which means there is relationship in both personality type and family support. There is no relationship between personality type and genital hygiene behavior. Good family support can improve hygiene behavior of young women. The existence of good family support will affect adolescents in behaving.

Keywords: personality type, family support, genital hygiene behavior, adolescent girl

Introduction

Adolescence is a transition from childhood to the next level. Adolescence is where there is a change in physical and psychological characteristics in a person. Adolescence women begin to experience puberty with menstruation. Maintaining the cleanliness of the genital area at this time is very important as an effort to improve reproductive health. Microorganisms can easily enter the reproductive organs due to poor genital hygiene. Poor or even bad hygiene habits, if done repeatedly, will have a serious impact in the future. High prevalence of poor MHM (menstrual hygiene management) and considerable school absenteeism due to menstruation among Indonesian girls highlight the need for improved interventions that reach girls at a young age. The management of menstruation presents significant challenges for women, and it is plausible that MHM can affect the reproductive tract.

The previous research of impact of toilet hygiene training programs found (58%) of respondents cleaned their genital area in the right way, i.e. from front to back, but there were still (25%) who did it from back to front, and (17%) did it randomly. Research conducted on female students in Bekasi Middle School said that, out of 102 respondents it was found (62.7%) of children washed their genitals from the front to the back, the rest did it the wrong direction, and (80.2%) students changed their underwear less than twice a day. There are several factors that cause genital hygiene not to be done well. Previous research said that the factor of a person’s character plays an important role in acting and behaving in everyday life. Jung divided individual attitudes into extrovert and introvert personality types, distinguishing individuals who are either more caring or indifferent about what is happening. According to Jung, personality is defined as the overall feeling, mindset, and behavior that is often used in carrying out adaptations that take place continuously during one’s life.
Based on previous research, it is stated that personality types affect students in the perception of prevention of vaginal discharge. Individuals with an introverted personality tend to have negative perceptions, as much as (65.6%), while those with extroverted personality find it easier to consult with others, because they have a positive perception, as much (64.8%), in handling it. There are other factors that influence genital hygiene behavior, such as family support. Fulfillment of family support can improve the health status of family members, because the family is the closest party to remind its members about each other. A good family support will produce good family member behavior. The existence of support from the family can also influence individual coping, handling stress, and increasing interpersonal skills.

Based on research in Surakarta, it is stated that students who have family support have the potential to be 1.50 times more likely to have good genital hygiene behavior than students who do not get family support. This has resulted in much inappropriate behavior of adolescents or even wrong genital hygiene. Poor behavior in genital hygiene in adolescents will cause signs and symptoms in the form of hives, redness, irritation, vaginal discharge and infections, or even more severe problems, if ignored. The family support instrument uses a family support questionnaire developed by previous research by Febriyanti. The choice of answers consists of TP (never), KK (sometimes), SR (often), and SL (Always). The total score of respondent’s family support is poor when the accumulation of scores is in the range of 25-48, the accumulated score of 49-72 is categorized in moderate family support and good family support if the respondent gets a score of 73-96. The dependent variable in this study is the behavior of genital hygiene. The genital hygiene behavior instrument uses a measuring instrument developed by Amelia et al. consisting of 15 items entailing three parameters, namely general hygiene, genital hygiene and genital hygiene during menstruation. Choice of answers used the checklist (√) in the column provided. The choice of answers consists of TP (never), KK (sometimes), and S (always). The calculation results have a maximum score of 30. Scores of 0-10 are categorized as poor genital hygiene behavior, scores of 11-20 means that respondents have moderate behavior hygiene, and, if the respondent scores 21-20, it is categorized as good genital hygiene behavior.

**Method**

**Study Design, Setting, and Sampling:** This research uses non-experimental studies included in the correlational study with cross-sectional methods. The sample in this study were female adolescents students in Senior High School (SMPN) 29 Surabaya, involving 116 respondents using random sampling technique.

**Study Variables:** The independent variables in this study are personality type and family support. Instruments to determine the personality type in this study used the MBTI questionnaire (Myers-Briggs type indicator). The choice of answers does not determine right or wrong, the respondent simply chooses one answer from the answer choices, “a” or “b”. A person’s personality type can be known through the accumulation of the respondent’s answers, if the accumulated answer scores ≥13 then it indicates that the respondents are more likely to extrovert personality type, but if the answer score accumulated ≥13 then the respondent’s personality type tends to introvert.

<table>
<thead>
<tr>
<th>Class</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>65</td>
<td>56.0%</td>
</tr>
<tr>
<td>VIII</td>
<td>40</td>
<td>34.5%</td>
</tr>
<tr>
<td>IX</td>
<td>11</td>
<td>9.5%</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Results**

This research was conducted at SMP Negeri 29 Surabaya, located on the road Prof. Moestopo No. 4, RT 01/RW 01, Kel. Pacarkeling Kec. Tambaksari Surabaya, East Java.

Based on Table 1, related to demographic characteristics, it can be seen that most respondents sit in class VII with a total of 65 (56.0%) female students. The number of the 13-year-old majority respondents was seen from the data as 52 (44.8%).

**Table 1: Demographic characteristics of respondents n: 116**
Based on the data in Table 2 below, it shows that the personality type of respondents as mostly extroverted, as many as 60 (59.5%). Family support received by respondents shows all respondents have a good family support, as many as 70 (60.3%).

<table>
<thead>
<tr>
<th>Variable of view</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality type</td>
<td>Extrovert</td>
<td>69</td>
<td>59.5%</td>
</tr>
<tr>
<td></td>
<td>Introvert</td>
<td>47</td>
<td>40.5%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>116</td>
<td>100%</td>
</tr>
<tr>
<td>Family support</td>
<td>Poor</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>46</td>
<td>39.7%</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>70</td>
<td>60.3%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>116</td>
<td>100%</td>
</tr>
</tbody>
</table>
| Genital hygiene behavior | Poor | 0 | 0%
|                  | Moderate | 34 | 29.3%
|                  | Good     | 82  | 70.7%
|                  | Total    | 116 | 100% |

Based on Table 3 below, it shows that respondents who have genital hygiene behavior in the net category found in extroverted personality types, as many as 44 (37.9%), did not get less support from their families, and the support obtained by respondents was dominated by good family support, as many as 71 (60.2%). Similar to family support, there were no respondents who had bad behavior or were not clean; respondents mostly had clean genital hygiene behaviors, as many as 84 (71.2%) and respondents with an introvert type as many as 38 (32.8%). The results of statistical tests using chi-square correlation test showed that p > α (0.076 > 0.05), which means that there is no relationship between personality type and genital hygiene behavior in adolescent girls.

<table>
<thead>
<tr>
<th>Genital hygiene behavior</th>
<th>Extrovert</th>
<th>Percentage</th>
<th>Introvert</th>
<th>Percentage</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>25</td>
<td>21.6%</td>
<td>9</td>
<td>7.8%</td>
<td>34</td>
<td>29.3%</td>
</tr>
<tr>
<td>Good</td>
<td>44</td>
<td>37.9%</td>
<td>38</td>
<td>3.8%</td>
<td>82</td>
<td>70.7%</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>59.5%</td>
<td>47</td>
<td>40.5%</td>
<td>116</td>
<td>100%</td>
</tr>
</tbody>
</table>

p = 0.076
Based on Table 4, it shows that there were no respondents who behaved unclean in maintaining genital hygiene. Respondents who have cleanliness in the net category majority have good family support, as many as 55 (47.4%).

Based on the chi-square correlation statistical test results, it obtained $p = 0.036$ with a significance level of $p < \alpha$ or $p < 0.05$ ($0.036 < 0.05$), so that there is a correlation between family support and genital hygiene behavior in adolescents.

### Table 4: Relationship between family support with genital hygiene behavior in adolescent girl

<table>
<thead>
<tr>
<th>Genital hygiene behavior</th>
<th>Family support</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less (f)</td>
<td>Percentage (%)</td>
<td>Moderate (f)</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>0</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>46</td>
</tr>
</tbody>
</table>

$p = 0.036$

### Discussion

There is no correlation of personality types with genital hygiene behavior in adolescent girls. Based on previous research, there is a relationship between personality types and adolescent health behavior.16 Family relationships were available at baseline and information on behavioral and mental health outcomes (self- and parent-reports) were available at follow-up ages of 18 and 25 years.17 This contrasts with the results of the research that have been obtained. The differences causing the opposing results to is the age of the respondent. Previous research examined adolescents aged 16-17 years, and these differences can affect a person’s personality type because, at that age, they already know information, and more experience is obtained than teenagers in junior high school, so that it can affect respondents in behaving. This is corroborated based on adolescent growth, which states that the age of junior high school students is the category of early adolescents, and the age of high school students is the category of middle adolescents, where psychological and cognitive maturity is more dominant in middle adolescents.18

The differences in this study may be due to differences in background that shape the personality of the respondents. This is reinforced by previous research that there are environmental factors that support the formation of one’s personality. Environmental factors include family, culture and school.19

There was a relationship between family support and genital hygiene behavior in adolescent girls, which meant answering and proving the second hypothesis by obtaining a 0.036 correlation value so that it can reduce the risk of the child having problems in their genital area, such as infection, vaginal discharge, itching, and others. Previous research shows that, even though most of the respondents have heard of RTI’s (reproductive tract infections) and sought treatment when symptomatic, they demonstrated poor overall understanding of the subject.20 This is consistent with previous research, that the increased family support or parental strategies in increasing their relationship with children can help children in preventing bad and unhealthy habits.21 External support from family members and friends has been indicated as being important for maintaining oral health for the vulnerable group of care home residents.22

Other studies also say that children who do not get good support from their families are more likely to be negligent in maintaining the perineal hygiene than children who get family support.23

Most of the family support obtained by the respondents received good support. This indicates that the four functions of the family occur well, such as the family’s function in providing information, motivation, rewards, and provision. For example, in filling out a family support questionnaire on item No. 15.17 instrumental support, and 19 respondents obtaining high scores. The existence of good communication between parents and children is the initial foundation of a good relationship, and this will support the quality of family support provided.
Conclusion

Most respondents have extroverted personality types and good family support. There was no correlation between personality type and genital hygiene behavior in adolescent girls, but there is correlation between family support and genital hygiene behavior in adolescent girls. The researchers recommend that families pay more attention and provide information about genital hygiene in adolescent girls.

Ethical Clearance: The researcher has obtained a certificate of eligibility for ethical testing with no: 921-KEPK Faculty of Nursing Universitas Airlangga.

Source of Funding: This study and publication was self-funded by the authors.

Conflict of Interest: None

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The ST-36 Acupressure Increased Gut Motility To Sectio Caesarea Patients with Subarachnoid Block Anesthesia

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ABSTRACT

Postoperative patients with Subarachnoid Block anesthesia will experience paralytic ileus. Various efforts to overcome this have been carried out, including early mobilization, chewing gum, warm compresses, and acupuncture. The actions taken have not yet shown maximum results. This study aimed to analyze the effect of ST-36 acupressure on gut motility and flatus time in postoperative patients with Subarachnoid Block anesthesia. This research used Quasi-Experiment with pretest-posttest group design. Population in this research was post operation patient with Subarachnoid Block anesthesia in Sidoarjo Hospital. A sample of 14 respondents in control group and 14 respondents in experimental group were obtained using purposive sampling technique. Data retrieval was done by criteria using lidodex 100mg/2ml anesthetic or 5% lidocain + adrenaline. Data were analyzed using independent t test. The result showed that there was difference average frequency of gut motility between control group and experimental group after given intervention ST-36 acupressure (p=0.013). The time of flatus showed that there were no significant differences in the two groups (p = 0.262). It can be concluded that ST-36 acupressure can increase gut motility, whereas it did not affect flatus time.

Keywords: Gut Motility; ST-36 Acupressure; Subarachnoid Block; Sectio Caesarea.

Introduction

Subarachnoid Block (SAB) anesthesia is usually used in lower abdominal surgery, inguinal areas, perineum, and lower extremities.¹ Spinal anesthesia slows gastrointestinal motility and causes nausea. Decreased gastrointestinal motility can lead to paralytic ileus, which results in gas accumulation and abdominal distension.² Intestinal manipulation during surgery, reduced immobilization and oral intake can all affect bowel function. Normal intestinal peristalsis will disappear within a few days, depending on the type and duration of surgery.³ The intestine will return to normal activity and function after the effects of the anesthetic are gone.⁴

Flatus is an important indicator in restoring postoperative bowel function. Recovery of intestinal motility is the initial stage in post-surgery; bowel motility returns within 24-48 hours and the motility of the colon recovers within 3-5 days.⁵ randomized, controlled trial design. An urban medical center in Taiwan. 60 patients with colorectal cancer who had undergone abdominal surgery.

METHODS: Patients were randomly assigned to two groups, the ST-36 acupressure group (n = 30 Patients who have not recovered their intestinal peristalsis after anesthesia can suffer from obstructive ileus or intestinal obstruction if, at that time, they are given food intake.⁶ Therefore, patients often complain because they have to wait a long time to be able to eat and drink, so that the patient as to endure lengthy hunger and thirst.

Based on a preliminary study in Rahman Rahim Sidoarjo Hospital from medical records, it was found that data on patients who were operated on using Subarachnoid Block anesthesia during 2014 obtained from medical records showed 706 patients with ages ranging from 13 to 76 years. The average patients numbers

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in January to March 2015 obtained 40 patients who were operated on using Subarachnoid Block anesthesia. In 50% of patients, the return of flatus time was <24 hours, 37.5% of patients at flatus return within 24-48 hours and 12.5% of patients with flatus within >48 hours. When the patient’s hemodynamic status is stable, the patient will be encouraged to mobilize to stimulate his intestinal peristalsis. Based on existing data, there were about 88 patients experiencing prolonged recovery of intestinal peristalsis in one year.

Various efforts have been developed to overcome this, including early mobilization, chewing gum, warm compresses, and electroacupuncture use.7,8 The results of previous studies indicate that acupressure in ST-36 (Zusanli) was able to accelerate first flatus time, oral fluid intake, and improve postoperative gastrointestinal function.5 An urban medical center in Taiwan. 60 patients with colorectal cancer who had undergone abdominal surgery. Patients were randomly assigned to two groups, the ST-36 acupressure group (n = 30) Other supporting research proved that there were differences in the acceleration of recovery time of gastrointestinal motility in patients post-colorectal surgery performed by electro-acupunture (EA) on ST-36. Point ST-36 is a body acupuncture point that has a strong effect; this point is able to improve the immunological response and endurance.9

Various studies have been conducted to accelerate intestinal motility repair due to the action of anesthesia, for example by acupuncture and electro-acupuncture. However, this therapy is not a convenient therapeutic procedure, because it uses invasive techniques and must be carried out by trained experts. However, there are other alternative techniques, such as therapy that is more easily applied, namely acupressure. Acupressure is a Chinese medicine therapy and has the same basic principles as acupuncture treatment. Acupressure is a non-invasive, safe therapy, and one of the therapeutic techniques that is easy to do using only fingers, elbows or blunt tools, such as wooden sticks, so that patients will feel more comfortable when given therapy.10

Based on the above phenomenon, the researchers were interested in conducting a study of the effect of ST-36 acupressure to improve intestinal motility and flatus time postoperative patients with Subarachnoid Block anesthesia.

Method

Study Design, Setting, and Sampling: The research design used was Quasi-Experiment with the design of the pretest posttest group in postoperative patients under Subarachnoid Block anesthesia. The population in this study was all postoperative patients with Subarachnoid Block anesthesia in Hospital Sidoarjo. The sample of 28 postoperative patients with Sectio Caesarea under Subarachnoid Block anesthesia consisted of 14 treatment group respondents and 14 control group respondents who were recruited by purposive sampling technique. The sample was recruited using the criteria between 18 years and 55 years old, using lidodex 100mg/2ml anesthetic or 5% lidocain + adrenaline, surgery in the abdominal area, and the body area to be stimulated (akupresure ST-36) does not experience injury, swelling or fracture. The treatment group received ST-36 mobilization and acupressure intervention, while the control group received hospital standard intervention, namely mobilization. The study was conducted May 17 to June 11, 2015.

Study Variables: The independent variable is ST-36 acupressure given by the researcher to patients with reference to the module. The parameters of the ST-36 acupressure module are massage performed at the ST-36 meridian point, which is four fingers under the patella and one thumb wide outward from the shin. Massage time three minutes with 1-1.5cm on both feet. Massage twice, first after the patient’s hemodynamic status is stable and eight hours later. The dependent variable was intestinal motility and flatus time, which was assessed by observation before the action (pretest) and after the action (posttest). Gut motility observation by researchers was done using a stethoscope. Observation of flatus time was carried out by the researcher by asking the patient what time was flatus. Observation of the pretest was carried out after the patient was transferred to the inpatient room, that is, after completion of the recovery room or when the patient’s condition was stable (about one hour in the recovery room). Observation of posttest was carried out after eight hours of pretest and given ST-36 acupressure.

Data Analysis: This study uses descriptive analysis carried out using the number of frequencies and percentages for categorical data and the mean, median, and standard deviation used for numerical data. Analysis of the main data used the independent t test with a significance level of p <0.05.
Results

The results of the research in Table 1 show that, out of 28 respondents, there are six early adult respondents (26-35 years) in the treatment group and eight respondents in early adulthood in the control group. Regarding the proportion of respondents’ weight in the treatment group and the control group, the majority of weight was between 51-60 kilograms (78.6 % and 92.9%, respectively). In addition, most of the respondents in the treatment and control groups were housewives (57.1 % and 50%, respectively).

The mean frequency of intestinal motility pretest in the treatment group was no better than the control group (Table 2). Standard deviation of intestinal motility pretest in the treatment group was more homogeneous than in the control group. The independent t test results obtained p value = 0.803, which means there was no significant difference in the value of intestinal motility pretest respondents in both groups (same condition). The first test in the treatment group had a slightly less good intestinal motility (4.79 x/minute) compared to the control group, which was 3.29 x/minute. Specifically to answer the purpose of research, statistical results obtained independent t test with p = 0.013, which means there is a significant difference test value of post-intestinal motility of respondents in both groups. In addition, the average flatus time in the treatment group was better (22.86 hours), while, in the control group, it was 26.64 hours. Independent t test results obtained p value = 0.262; it can be interpreted that there is no significant difference between flatus time in the treatment group and the control group.

Table 1: Data on patient characteristics (N = 28)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Treatment Group n (%)</th>
<th>Control group n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 - 25 years</td>
<td>6 (42.9)</td>
<td>4 (28.6)</td>
</tr>
<tr>
<td>26 - 35 years</td>
<td>6 (42.9)</td>
<td>8 (57.1)</td>
</tr>
<tr>
<td>36 - 45 years</td>
<td>1 (7.1)</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>46 - 55 years</td>
<td>1 (7.1)</td>
<td>1 (7.1)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 - 50 kilogram</td>
<td>2 (14.3)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>51 - 60 kilogram</td>
<td>11 (78.6)</td>
<td>13 (92.9)</td>
</tr>
<tr>
<td>61 - 70 kilogram</td>
<td>1 (7.1)</td>
<td>1 (7.1)</td>
</tr>
</tbody>
</table>

Table 2: Data on intestinal motility and time of flatus patients and the results of statistical analysis (N = 28)

<table>
<thead>
<tr>
<th>Category</th>
<th>Treatment Group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Intestinal motility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.64</td>
<td>4.79</td>
</tr>
<tr>
<td>Median</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.633</td>
<td>1.251</td>
</tr>
<tr>
<td>Independent t test (pre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.803</td>
<td></td>
</tr>
<tr>
<td>Independent t test (post)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.013</td>
<td></td>
</tr>
<tr>
<td>Time flatus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>22.86</td>
<td>26.64</td>
</tr>
<tr>
<td>Median</td>
<td>23.00</td>
<td>24.50</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>6.262</td>
<td>10.638</td>
</tr>
<tr>
<td>Independent t test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.262</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The results showed that the intestinal motility of respondents in the treatment group experienced a significant increase after ST-36 acupressure was given compared to the control group respondents. The results of this study are in line with previous studies which stated that ST-36 acupressure can improve gastrointestinal function in postoperative patients with colorectal cancer. An urban medical center in Taiwan. SAMPLE: 60 patients with colorectal cancer who had undergone abdominal surgery.METHODS: Patients were randomly assigned to two groups, the ST-36 acupressure group (n = 30) This condition occurs because the digestive tract in postoperative patients will move slowly due to side effects of anesthesia, where, when anesthesia occurs paralysis, the digestive muscles need time to adapt again. Physiologically, P increased frequency of bowel...
motility is meaningful because the drug’s effectiveness has been declining over time. When the work of the drug ends, the inhibition of spinal stimulation begins to decrease and the lower digestive muscles begin to work, which is characterized by an increase in the frequency of bowel sounds, reduced nausea, flatus and bloating does not exist.12 The results of this study indicate that physiological processes can be traversed rapidly because ST-36 acupressure can stimulate the hypothalamus for acetylcholine mesecretion and substance P. These substances play a role in the muscle movements of the gastrointestinal system so that it stimulates intestinal motility.10

Return of the function of intestinal motility in postoperative patients can be influenced by several factors, including age, gender, type of surgery, weight and work or activity. The results showed that the factors that influence the return of patients’ intestinal motility function are homogeneous. Regarding age of respondents in both groups, including young adults, where age indicates good development of the gastrointestinal system, movement of intestinal motility decreases with increasing age and slows down esophageal emptying.13 Meanwhile, the sex and type of surgery are each only one criterion, namely, all female sex and surgery performed by sectio caesarea. The type of operation equation does not show differences in the dosage of anesthesia given, so that the length of recovery time of the gastrointestinal system is generally the same.11

Another factor is weight, where b is closely related to the effectiveness of acupressure. Acupressure ST-36 is performed by the therapist’s hand so that the thicker the fat layer of the patient, the depth and strength of the emphasis will be different.14 In addition to body weight, in this study the activity of respondents was associated with the type of work. Aktivitas will influence the physiological function of organs, whereby a person who often moves his organs will function better than the rare mover.15 Other physiologists also show that blood circulation in the gastrointestinal tract and the lining of the intestinal wall is directly related to the level of activity. Motor, secretory and absorptive functions will increase after activity, as well as gastrointestinal circulation.15

Other research results are that there was no effect of ST-36 acupressure on flatus time between the treatment group and the control group. This situation is possible because, in both group, there were several respondents who had intestinal motility at the time of post-surgery. This situation is in accordance with Home Visits which states that the factors affecting the occurrence of flatus include intestinal peristalsis, the contraction of the muscles of the abdomen and eating.16 The results also showed that almost all patients had normal amount of intestinal motility, between 5-35 x/minute; this was directly proportional to the increase in intra-abdominal pressure. Intestinal peristaltic movements also make the space become pressurized, thus, forcing the contents of the intestine, including the gas inside, to move toward a lower pressure, which is to around the anus.16 Flatus occurs when there is a peristalsis where gas is pushed into the rectum, resulting in increased pressure in the rectum and causing the sphincter to relax and occur flatus.15 After surgery, patients can first drink a little water, then can eat porridge and, if they can dispose of the wind the next day, then they can eat rice.17 The contents of the intestine are the main stimulus for the occurrence of product contractions and flue gas puts pressure on the walls of the colon.13

**Conclusion**

ST-36 acupressure can accelerate the increase in the amount of intestinal motility in postoperative patients under Subarachnoid Block anesthesia. The first flatus time in postoperative patients with Subarachnoid Block anesthesia was not proven to be accelerated by ST-36 acupressure. This therapy is expected to be collaborated with mobilization to get more optimal results, namely, accelerating the return of intestinal motility and flatus time. The main implications for nursing practice from this study were improving services and alternative therapies for returning intestinal motility and flatus time. Subsequent research related to the effect of ST-36 acupressure on intestinal motility and flatus time is expected to be carried out in postoperative patients with general anesthesia.

**Ethical Clearance:** The ethical approval for this study was granted by the IRB committee of the Faculty of Public Health at the Airlangga University in 2015.

**Source of Funding:** Self.

**Conflict of Interest:** None
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17. Farida VN. Effect of Warm Drinking on Post Operative Nausea Vomiting (PONV) in Patients with Sectio Caesarean Post Surgery with Spinal Anesthesia in the Post Anesthesia Treatment Unit. Bul Rumah Sakit Muhammadiyah. 13AD;1(14).
Depression in Patients with Heart Failure: A Phenomenological Study

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ABSTRACT

Depression is a common comorbid condition among patients with heart failure (HF). Depression in HF is associated with poor health outcomes, increased risk of mortality, readmission, and decrease in functional status. The aim of this study was to explore the experience of HF patients related to symptoms of depression. The study was conducted at a government hospital in East Java, Indonesia and used a phenomenological approach. The population of this study was inpatients with HF who were obtained through a purposive sampling technique. Eighteen HF patients were recruited as participants. Data collection took place from February to May 2016 by interview and field notes. Collected data was analyzed through thematic analysis. There were three main themes that emerged from the data: cognitive function, emotional, and somatic responses to disease. HF patients reported impaired cognitive functions, especially in decision making and perception of disease. They also had several emotional responses including sadness, guilt, hopelessness, suicide, crying, and anger. There were also somatic responses including energy loss, fatigue, disruption of sleep patterns, decreased appetite and sexual interest. Understanding the description of depressive symptoms in HF patients can help nurses and other health professionals provide appropriate interventions to reduce depression.

Keywords: heart failure, depression, symptom, qualitative, patient’s experience

Introduction

Depression is a common comorbid condition among patients with HF. The prevalence of depression ranged from 23.8% to 67% in hospitalized patients and around 16.7% to 70% in outpatients with HF.¹ In another study, the general prevalence rate of depression in HF patients ranged from 9% to 96.1%.² Compared with the general population, the prevalence of depression in patients with HF is higher.³ In conditions of advanced HF, worsening signs and symptoms of the disease also intersect with depressive symptoms, making it difficult to distinguish whether the symptoms are purely due to depression or progression of HF.²³

The presence of depression in HF is associated with deterioration of disease prognosis, increased risk of hospital readmission, as well as decreased in functional status.⁴⁵ HF patients with depression are at the highest risk of experiencing medication nonadherence, which causes a decrease in health status.⁶ In the majority of studies the relationship between depression and HF shows that an increase in depressive symptoms is significantly associated with a higher mortality rate.⁷ In addition, several studies show that depression is the main predictor of poor quality of life in patients with HF.⁷⁸

Several studies have examined the relationship between depression and some somatic symptoms in HF, i.e. fatigue, sleep disturbance, daytime symptoms, and functional status. The number of HF patients with symptoms of fatigue and depression is greater than those who do not have both symptoms.⁹ Fatigue and depression become mediating factors between insomnia symptoms and self-reported functional performance.¹⁰ Daytime symptoms (fatigue, excessive daytime sleepiness, and depressive symptoms Patients who continue to
experience sleep disturbance over time are at risk of doubling the incidence of hospital readmission.11

Most of the previous studies examined the symptoms of depression quantitatively and made a connection with other variables.1,4–10,12,13 The recent qualitative studies have also explained the experiences of patients living with HF, which one of them explains the detail experiences related to symptoms of breathless.14–19 However, there is a lack of information describing how depression symptoms are experienced by patients and what are the most common symptoms of depression among patients with HF. Therefore, the aim of this study was to explore the experience of HF patients related to symptoms of depression.

Method

This study used a phenomenological approach to gain an understanding of the experience of HF patients related to symptoms of depression. The population of the study was inpatients with HF at a government hospital in East Java, Indonesia. Participants were selected using a purposive sampling technique. The inclusion criteria were: had been diagnosed with HF at New York Heart Association (NYHA) class III to IV, had a stable hemodynamic state, could communicate verbally using Javanese or Indonesian, and were willing to participate in this study. The advanced stage of HF was selected because, theoretically, most of patients in this stage suffer from depression. Participants were excluded if they were not cooperative in interviews and needed critical treatment in ICU/ICCU.

Data collection took place from February to May 2016 by twenty-one semi-structured interviews. All interviews were conducted by the lead author and took between 45 and 60 minutes. Data obtained were processed and analyzed using thematic analysis of Colaizzi methods. All interviews and field notes were transcribed as a whole and extracted to formulate meanings from the phrases and statements. Meanings were organized into categories, sub-themes, and themes.

Results

Eighteen patients with HF were enrolled into the study. Table 1 presents the characteristics of the study participants. The participants were mostly male (55.6%) with a mean age of 53.6 (SD 10.7) and an age range of 36-71 years. Most participants were less educated (61.1%), were married (77.8%), and were unemployed (61.1%). More than half of the participants were in NYHA class III (55.6%) and were admitted to the hospital for the first time (61.1%).

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Education</th>
<th>Admission History</th>
<th>NYHA Classification</th>
<th>Marital Status</th>
<th>Job Status</th>
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<tr>
<td>P2</td>
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<td>III</td>
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<tr>
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<tr>
<td>P4</td>
<td>62</td>
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<td>First</td>
<td>III</td>
<td>Widow</td>
<td>Unemployed</td>
</tr>
<tr>
<td>P5</td>
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<td>Primary</td>
<td>First</td>
<td>III</td>
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<td>Unemployed</td>
</tr>
<tr>
<td>P6</td>
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<td>Second</td>
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<tr>
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<td>P8</td>
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<tr>
<td>P9</td>
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<td>III</td>
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<td>P11</td>
<td>47</td>
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<td>Third</td>
<td>III</td>
<td>Married</td>
<td>Unemployed</td>
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<tr>
<td>P12</td>
<td>36</td>
<td>Male</td>
<td>High</td>
<td>Third</td>
<td>IV</td>
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<td>Unemployment</td>
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<tr>
<td>P13</td>
<td>60</td>
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<td>IV</td>
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<tr>
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<td>First</td>
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<tr>
<td>P15</td>
<td>56</td>
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<td>Primary</td>
<td>First</td>
<td>III</td>
<td>Married</td>
<td>Unemployed</td>
</tr>
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</table>
Three main themes emerged from the phenomenological analysis: the cognitive functions of HF patients, emotional responses due to HF, and somatic responses to disease.

1. Cognitive Function: Patients with HF reported impaired cognitive functions, especially in decision making and perception of disease. Almost all participants expressed an inability to make decisions for themselves. They were very dependent on their family and other support systems in making decisions about treatment, financing, and care.

“I can’t think of anything else, mam. I leave it to my daughter. Everything depends on how my daughter is. She is the one who takes care of everything.” (P5)

“I’m confused, mam. I don’t know how to deal with this pain.” (P10)

Patients also showed different perceptions of their illness. Some patients positively perceived the condition of their illness. However, other patients negatively revealed that the illness suffered was a form of God’s anger due to their actions in the past.

“I am sure God loves me, so He trial me like this. Maybe because I used to sin a lot, so I was reminded of this illness.” (P13, P15)

“I am sick, because God is angry with me. He want to punish me because I rarely worship.” (P10)

“I wondered why God gave me this illness. What did I do wrong?” (P6)

2. Emotional Responses: The most emotional responses that emerged in this study were sadness, feelings of guilt, hopelessness, suicide, crying, and anger. Various expressions of sadness arose from patients due to their illness. They were sad because their role was disturbed and burdened with medical expenses.

“I have been hospitalized for months. I am sad that I cannot gather with my children.” (P12)

“Because of this illness, I can’t work. Though a lot of costs have to be spent… It’s sad. How is paying for the hospital?” (P10)

The patients showed feelings of guilt for the illness they suffered. Most patients felt a lot of sinning towards God and that they had performed wrong life patterns in the past.

“My sins are many, maybe, so God give me this.” (P10)

“I used to eat a lot, Mam. A day can be up to five times. I don’t like the vegetables. Maybe because of that I became sick like this.” (P12)

The patients also displayed crying and anger as expressions of sadness. Expressions of anger are usually revealed to the family via verbal and non-verbal expressions.

“…I’ve been crying a lot lately. I don’t know why. Just come out like that.” (P16)

“It feels like this chest is heavy. So, I want to keep crying.” (P5)

“I often get upset and perform it to my wife…” (P12, P13)

Patients who entered the hospital for the third time or more showed feelings of despair. They were tired of going into the hospital and wanted to end the hardships of their lives by suicide.

“I am already tired of frequently readmission to the hospital. I have been treated everywhere but there is no result. Tired of taking medicine too. I want to end it soon. It’s better that I am going to die, so I don’t bother my wife…” (P11, P12, P18)

3. Somatic Responses: Almost all participants showed a somatic response in the form of energy loss, fatigue, disruption of sleep patterns, decreased appetite, and decreased sexual interest. Response to loss of energy was indicated by the inability of patients to carry out activities as usual. Most patients just laid in bed and needed more effort to do something.

“I lay more on my bed. It’s hard to do anything. I’m afraid of getting worst. Just take a break, sometimes it’s suddenly tight.” (P2, P12)
This state of energy loss causes patients to get tired easily while on the move, even when performing minimal activities.

“I am tired. So usually just sit for a while, after that lay down again. If it is forced to sit for a long time, it is even more congested. “ (P12)

In advanced patients, tightness complaints appeared often. This causes patients to frequently wake up due to tightness, especially at night. Patients revealed irregularities in their sleep patterns that had an effect on sleep deprivation.

“I often wakes up at night because of tightness. Sometimes during the day, but often at night. So it’s difficult to sleep, I often disturbed. “ (P6, P5)

In addition, patients also showed a decrease in appetite and sexual interest. Decrease in sexual interest is more due to the physical condition of the patient.

“I have no appetite at all...” (P4)

“I have no interest in sexual activity. My husband also knows my condition. So, he doesn’t force it.” (P4, P18)

**Discussion**

The findings show that participants in this study experienced impaired cognitive functions, including the inability to make decisions and comprehend their disease. The inability to make decisions occurred both in older and younger patients. Patients showed dependence on their family or health workers in the treatment of illness. They expressed confusion and helplessness due to a lack of information regarding their illness and treatment. They also showed that they need support from the people around them. This finding is consistent with symptoms of depression in the general population, where depression affects a person’s ability to think. Depression can impair attention, memory, the processing of information, and decision making skills. It can cause a decline in cognitive flexibility. Patients with depression reveal biased utility judgments that can lead to the selection of sub-optimal alternatives and failure to maximize experienced utilities.

The second theme generated from this study is emotional responses due to disease. Participants in this study showed expressions of sadness, guilt, hopelessness, suicide, crying, and anger. These expressions become a sequence response due to the illness, began with feelings of sadness and guilt, then patients displayed crying and anger as negative emotional focused-coping. This is consistent with previous studies regarding emotional response in depression patients. Impairment in emotional responses is theoretically a main issue of depression. In several studies, depression was related to a deficit in positive affect. They report experiencing pleasant stimuli as less pleasant than healthy controls.

Somatic responses were the last theme of this study. These responses include energy loss, fatigue, disruption of sleep patterns, decreased appetite and sexual interest. All of these symptoms appear as natural trajectories of the disease, making it difficult to distinguish whether they were caused by depression or not. However, several previous studies had confirmed the link between depression and symptoms of HF, giving a clear explanation regarding the relationship. Some arguments suggest that pathophysiological mechanisms and worsening of physical conditions as a result of disease progression are the main causes of depression in heart failure patients. The main HPA axis activation plays an important role in neurohormonal regulation. In addition, the HPA axis also mediates the sympathetic nervous system hyperactivity as indicated by an increase in plasma levels of norepinephrine, epinephrine, and catecholamines. For example, cardiovascular, stroke, diabetes and obesity morbidity. These somatic consequences could partly be due to metabolic, immunoinflammatory, autonomic and hypothalamic-pituitary-adrenal (HPA Both of them compile to produce effects, not only on somatic symptoms of depression but also on HF physical symptoms.

**Limitations:** Our study has several limitations. First, as is the nature of qualitative studies, our findings cannot be generalized to the general HF population. However, our study has provided a comprehensive description of experience regarding symptoms of depression. Second, all interviews were conducted only in one region of Indonesia in East Java, which could not yet represent the cultural and ethnic differences of the HF population in Indonesia.

**Conclusion**

The findings of this study provide a deep understanding of HF patients’ experiences related to
symptoms of depression. There were three main themes that emerged from the phenomenological analysis, including cognitive function, emotions, and somatic responses to disease. Understanding the description of depressive symptoms in HF patients can help nurses and other health professionals provide appropriate interventions to reduce depression and subsequently improve quality of life.

**Ethical Clearance:** This study received ethical approval from Health Research Ethics Committee, Faculty of Nursing, Universitas Airlangga in 2016.

**Source of Funding:** This study used independent researcher funds

**Conflict of Interest:** The authors declare that they have no conflict of interest

**REFERENCES**


Spiritual Intervention and Thermal Stimulation in Pregnant Women with Back Pain

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¹Faculty of Nursing, Sultan Agung Islamic University, Semarang, Indonesia

ABSTRACT

Back pain is one complaint that is often experienced by pregnant women. This complaint increases with increasing maternal age. The purpose of this study is to determine the effectiveness of spiritual intervention and thermal stimulation of back pain in pregnant women. The method uses a quantitative with quasi-experiment pre-post test design with control on 40 people; subjects were taken by purposive sampling. Interventions in group 1 listened to Qur’anic murottal Ar Rahman surah and were given warm compresses, while in group 2, Qur’anic murottal was the subject’s favourite surah and were given warm compresses for 20 minutes. The data was analysed using the Wilcoxon and Man Whitney tests. The Wilcoxon test in group 1 showed that there was an effect of listening to murottal Alqur’an Ar-Rahman surah and warm compresses to decrease back pain, with p value 0.000. In group 2, there was an influence of listening to murottal Alqur’an favourite surah and warm compresses to decrease back pain, with p value 0.000. The Mann Whitney test from both groups showed no significant difference in decreasing back pain in groups 1 and 2 with p value 1.000.

Conclusion: There is a significant reduction in pain before and after intervention.

Keywords: Spiritual Intervention, Thermal Stimulation, Pregnant Women, Back Pain.

Introduction

Pregnancy is a physiological process that couples always expect in a family. During the pregnancy process the mother will experience changes in her body which often cause complaints. Complaints are common and are felt by almost every pregnant woman, including the back.¹

Complaints of back pain in pregnant women occur because it is influenced by several factors, including physical changes that occur during pregnancy. During pregnancy, women generally experience changes in body size and weight gain, the growing of the foetus in the uterus causes the abdominal wall to become stretched. Posture resulting from the stretching of the abdominal muscles can cause pregnant women to experience lordosis.²

Lordosis posture in pregnant women affects the shoulder, causing it to be attracted to the back due to prominent abdominal enlargement and for maintaining body balance, curvature of the vertebrae inward also becomes excessive. Sacroiliac joint relaxation that accompanies changes in body shape stimulates an increase in back pain. Complaints of back pain like this usually begin to be felt when entering the second trimester, and increases when gestational age increases. Pregnant women with complaints of back pain have a lower quality of life and more often complain of pain.³

Complaints felt by pregnant women who experience back pain have an impact on daily activities, so that the mother experiences a disruption in carrying out activities such as moving or changing positions, difficulty walking, sleep disturbances and emotional disturbances.⁴ Pregnant women with back pain must be careful in carrying out activities. It is very important to be given an understanding of ergonomic positions, and avoid maladaptive movements, improper pelvic movements and unbalanced weight.⁵ Treatment that is routinely carried out in the antenatal period can reduce pain in malposition due to back pain experienced by pregnant women.⁶
Complaints felt by pregnant women should not be ignored and must be treated so that the mother feels comfortable during her pregnancy. Back pain in pregnant women can be given pharmacologically or non-pharmacologically. Efforts to treat pharmacology can be done by administering analgesic drugs, while non-pharmacological management can be done by providing acupuncture, relaxation, massage, distraction and exercise therapy. Efforts to treat pain with pharmacology must be careful and it is necessary to monitor drug side effects that may occur, while handling pain with non-pharmacological is safer and does not cause side effects.

Many studies suggest that pregnant women often complain of back pain with mother experiencing disruption in carrying out daily activities. Research conducted on women’s experiences of low back pain during pregnancy finds that multipara pregnant women with back pain have a significant sleep disorder compared to primiparous mothers. From all pregnant women who experience back pain, the data obtained shows that 57.7% experience disruption of activity and 77.5% of mothers feel bored. Pregnancies in older women with back pain complain of pain in the legs, neurological disorders and disorders of elimination in both urination and defecation.

Management of warm compresses is part of non-pharmacological therapy that can be given in obstetric cases to women in the antenatal, intranatal and postnatal areas. In giving warm compresses the study subjects showed a significant reduction in pain before and after the intervention. Giving warm compresses in addition to reducing the level of pain can also increase blood flow to the local tissue. In addition to warm compresses, music therapy can also be done to reduce the level of pain and anxiety. Research conducted on the effects of music on labour pain relief, anxiety level and postpartum analgesic requirement, states that giving stimulation of auditory music therapy can reduce pain.

Research on efforts to overcome complaints of pain with the provision of warm compresses and music therapy is most often performed on mothers who face labour, while for mothers who experience back pain has not been done much. The average researcher gives treatment with warm compresses or just music therapy which then measures the pain level to be able to assess the level of reduction in pain that occurs. In this study a combination of warm compressing and murottal Alquran was part of auditory stimulation for distraction therapy.

Method

This research is a quantitative study that uses quasi-experimental design studies with two groups pre-test – post-test design with control in 40 research subjects taken through purposive sampling technique in Semarang City, Central Java Province, Indonesia. The treatment given to the research subjects was spiritual intervention and thermal stimulation. Subjects in group I were given interventions to listen to Qur’anic murottal Ar Rahman surah and warm compresses, while the research subjects in group II were given Qur’anic murottal interventions of favourite subject’s surah and warm compresses with a duration of 20 minutes.

Results

Table 1: Results of frequency distribution of low back pain before and after intervention in group I and group II pregnant women in Semarang City in 2018 (n = 40)

<table>
<thead>
<tr>
<th>Pain Level</th>
<th>Before Group I</th>
<th>Before Group II</th>
<th>After Group I</th>
<th>After Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Mild</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>11</td>
<td>55.0</td>
<td>10</td>
<td>50.0</td>
</tr>
</tbody>
</table>
Table 1. shows that before the intervention most of the research subjects in group I had moderate pain of (55%), while in group II the subjects experienced pain at the moderate and severe levels controlled at the same amount (50%). After the intervention, the research subjects in group I and group II showed a decrease in the degree of pain. In both groups the majority of the study subjects were in mild pain, as much as 95%.

Table 2: Differences in the level of low back pain before and after intervention in group I and group II pregnant women in Semarang City in 2018 (n = 20)

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th></th>
<th>Group II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean Rank</td>
<td>Sum of Ranks</td>
<td>N</td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>20a</td>
<td>10.50</td>
<td>210.00</td>
<td>19a</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>0b</td>
<td>.00</td>
<td>.00</td>
<td>0b</td>
</tr>
<tr>
<td>Ties</td>
<td>0c</td>
<td></td>
<td></td>
<td>1c</td>
</tr>
<tr>
<td>Z</td>
<td>-4.053b</td>
<td></td>
<td>-3.938b</td>
<td>Asymp.Sig.(2-tailed)</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td></td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Table 2 shows that in group I the results of the p value was 0.000 which means that there is a significant difference in the level of back pain in group I before and after the intervention. So it can be concluded that there is an effect of murottal Qur’anic given from Surat Ar-Rahman and warm compresses to reduce back pain in pregnant women.

The table also shows that in group II the processing results obtained a p value of 0.000 so that H0 was accepted, there were differences in back pain before and after intervention in the study group II subjects and it could be concluded that there was an effect of preferred use of murotal surrah listening and giving warm compresses to reduce back pain.

Table 3: Effectiveness of spiritual interventions and thermal stimulation on decreasing back pain in pregnant women in Semarang City in 2018 (n = 40)

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>20</td>
<td>20.50</td>
<td>410.00</td>
</tr>
<tr>
<td>Group 2</td>
<td>20</td>
<td>20.50</td>
<td>410.00</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the results of processing data are p value 1.000, which means H0 is rejected, meaning that there is no significant difference in decreasing back pain in giving Qur’anic murottal Ar-Rahman surah as spiritual intervention and thermal stimulation by giving Qur’anic murottal to the favourite subject’s surah as spiritual interventions and thermal stimulation. These results have the meaning of Qur’anic murottal spiritual intervention listening to Ar-Rahman surah and thermal stimulation by giving spiritual intervention listening to the subject’s favourite surah and thermal stimulation with warm compresses having the same impact on decreasing back pain in pregnant women.

Discussion

Research shows that murotal spiritual interventions listen to Qur’anic murottal Ar-Rahman surah and thermal stimulation by giving spiritual interventions to listen to the subject’s favourite surah and thermal stimulation with warm compresses have the same impact on decreasing back pain in pregnant women. The intervention given to both groups equally significantly affected the reduction of pain in pregnant women.

Spiritual intervention in the form of listening to Qur’anic murottal is part of distraction therapy. Distraction therapy is a form of therapy that is done to divert attention to other things that can make patients forget about the pain that is felt.13 Auditory stimulation can affect emotions, activities of the brain and also the nervous system and cardiac output.14 The auditory interventions provided by one of them can be Qur’anic murottal listening. Qur’anic murottal interventions are received by the auditory system, are transmitted to the brain which in turn affects the limbic system. Hearing stimulation is accepted by the brain in the midbrain region which stimulates the midbrain to secrete Gama Amino Butyric Acid (GABA), enkephalin and beta
endorphin, which act as electric conductive inhibitors, have an analgesic effect and function as a softener. Increases in hormone endorphins are able to reduce stress levels and control the pain felt by individuals. The use of the Qur’anic murottal stimulation is a simple action to be carried out and optimizes the religious side of the research subject. Qur’anic murottal administration when compared with other auditory therapies such as music has more influence on pain reduction. Patients who experience long-term pain conditions need a spiritual touch to increase their enthusiasm and strength in dealing with their pain.

Providing warm compresses of thermal stimulation has the benefit of increasing the temperature of local skin, promoting blood circulation, stimulating blood vessels, reducing muscle spasm, relieving pain sensations, and providing calm and comfort. Warm water is a means of slowly pumping the heat to the body, which has a positive effect. Warm water can also affect the outer body, inner body and blood circulation. Warm temperatures can make a positive value for the body’s energy because it has a good influence on cell components which consist of various electrons, ions and others. Warm water with a temperature of 35-40 °C has a physiological impact on the body which can prevent muscle spasm and smooth blood flow so as to reduce pain. The water temperature at the time of giving compresses for thermal stimulation must be maintained. Giving compresses can be carried out in between 15 and 20 minutes.

The physiological effects of heat therapy can relieve pain, increase blood flow and metabolism and increase the elasticity of connective tissue. Thermal therapy in the form of a warm compress is passed on by the TRPV1 TRP nerve transduction receptor (TRPV1), which is a heat receptor. This TRPV1 receptor is in the primary afferent neurons, spinal cord, and throughout the brain. Activation of TRPV1 receptors in the brain can reduce antinociceptive effects. Heat stimulation in tissues stimulates vasodilation and blood flow to the tissues so that the supply of nutrients and oxygen to the location of pain becomes smooth. This condition increases peripheral metabolism, provides warmth, and makes the muscles of the body become more relaxed and reduce pain.

Warm compress therapy is one of the non-pharmacological methods for relieving pain that can be done easily, with various variations of giving and using available equipment at any time without the need for complicated skills. But if done correctly, it will have a significant impact on reducing pain.

Conclusions

The study concluded that spiritual intervention and thermal stimulation were effective for reducing back pain in pregnant women in Semarang City. The provision of spiritual interventions by listening murolatal and thermal stimulation by providing warm compresses can make pregnant women experience relaxation of their back pain. The two interventions support and enhance the mother’s comfort so that back pain is significantly reduced.

Ethical Clearance: The ethical approval for this study was granted by the Ethics Committee of the Faculty of Nursing at the Sultan Agung Islamic University in 2018

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Conflict of Interest: None

REFERENCES


Clinical Supervision Training to Increase Nurses’ Work Performance in Hospitals

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ABSTRACT

A common problem often faced by healthcare service management is the difficulty in finding qualified nurses. Training is one of the characteristics of an organization that has a positive impact on increasing professionalism and the work performance of nurses at the hospital. Improving supervision is a method to monitor the quality of services by hospital supervisors. This study attempts to determine the effect of clinical supervision training as one of the organizational characteristics on increasing the work performance of nurses at the hospital. The quasi-experimental study design was used in this study with 68 nurses who were working in a hospital in Banjarmasin. The observation was carried out before and after training. The dependent variable in this study is clinical supervision training, and the independent variable is work performance. Univariate, and bivariate were used in data analysis. There was an effect of clinical supervision training as one of the organizational characteristics on increasing the work performance of nurses at the hospital (p=0.00). Clinical supervision training increased work performance on clinical supervision abilities. Nurse training improved the quality of healthcare services, especially nursing care.

Keywords: clinical supervision, nurse, work performance

Introduction

The difficulty of finding health workers, including qualified nurses, is a common problem often faced by hospitals or health services.¹ This has an impact on the low quality of performance.² Hospitals have limited resources. They see performance improvement activities centred only on increasing cost requirements, not adding value to building the organizational commitment.³ Based on the pilot study, the patient’s perception of the quality of nursing services is still lacking (25.85%). Nursing services are not a good enough category (> 20%) including the aspects of providing nursing services according to a nursing appointment. A hospital as an organization depends on how to utilize human resources who have optimal work productivity.⁴ The low performance of nurses is related to an overload of work, long shifts, the complexity of work relations, and lack of opportunities for career development.⁵ One of the characteristics of career development for nurses in hospitals is training. Career training and development can impact organizational commitment and nurses’ belief in work so that they can improve nursing performance and provide satisfaction to patients while they are hospitalized.⁶,⁷

Nurses need moral support, personal quality development, integrity, knowledge, and self-awareness.⁸ The previous study explained that clinical supervision affects the quality of services so that they can be considered as activities and improve the quality of nursing practice.⁸ Practical nursing is always associated with supervision. Nursing and supervision care training is proven to increase nurse motivation and performance.⁹ Supervision is one form of supervision carried out in the inpatient ward. The implementation of supervision has a positive impact on staff professionalism and accountability. Clinical supervision is effective for improving the quality of patient care.¹⁰

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Nowadays, clinical supervision in the hospital is carried out unscheduled, unstructured, is not recorded, and is not given good feedback. In the end, clinical supervision activities cannot give objective results in improving the quality of nursing performance. This happens because supervisors do not properly understand the concept of clinical supervision. There are some supervisors who are aware of the concept of clinical supervision. They are willing to argue that their work does not only involve supervising clinical supervision activities. The head of the nursing department said that, so far, supervisors had not received specific clinical supervision training. Most of the training that they have is in general training such as ward management or head nurse management.

Activities which are carried out by supervisors are expected to guarantee nursing interventions in standards. Supervisors have responsibility for care management, but they were not fully properly and correctly implemented in clinical supervision activities. The hypothesis in this study is that there was an increase in clinical supervision abilities after supervisors received clinical supervision training. The aim of this study was to determine the effect of clinical supervision training to increase the work performance of nurses at the hospital.

Method

This study was a quasi-experimental pre-post test control group design with the intervention group in the form of clinical supervision training and the control group not given training. There were 68 nurses with each group consisting of 34 nurses. A simple random sampling technique was used in this study. The inclusion criteria were associate nurses who worked in an inpatient room and who had more than three years for work experience.

The study was conducted at Ulin General Hospital Banjarmasin from April to June 2016. Data collection used a checklist observation sheet that contained the supervision activities. The supervision activities were how the supervisor performed as a role model in giving nursing intervention, how to evaluate the nursing intervention, how to encourage nurses, how to make scheduling the nursing shifts, and giving the reinforcement for the nurses who successfully implement the nursing process. The instrument was developed from the evaluation of supervision activities by Keliat and Akemat by adjusting the clinical supervision model developed by Brigid Proctor.11

The preliminary data was carried out by observing the room supervisor who carried out the clinical supervision to the nurses who implement nursing care. Room supervision was assessed by the guidelines of the observation sheet that had been prepared. Observations were carried out in 34 clinical supervision activities in each group. Supervised implementing nurses were recorded, then on different days observed at the time of treatment (without supervision) as preliminary data on the ability of care during the nursing procedure before treatment. The intervention phase was conducted in clinical supervision training to supervisors who were in the intervention group on April 15, 2016, while in the control group there was no clinical supervision training. The participants of training (intervention group) got the training module which contains topics on the implementation of clinical supervision in care. The training is carried out in several stages, including the provision of cognitive and affective knowledge for ten hours and implementation assistance to increase psychomotor abilities for two weeks.

Univariate analysis was used to determine the distribution of age, gender, education level, and work period. A paired sample t-test and independent sample t-test were used to analyse the variables with a significance level of 0.05.

Results

The characteristic respondents are shown in the table below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristics</th>
<th>Group</th>
<th>Intervention (n = 34)</th>
<th>Control (n = 34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>27.91</td>
<td>27.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.397</td>
<td>2.914</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min-Max</td>
<td>22-36</td>
<td>22-32</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Work experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>5.7</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.686</td>
<td>2.722</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min-Max</td>
<td>3-12</td>
<td>3-14</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Education background, Σ (%)</td>
<td></td>
<td>23 (67.65%)</td>
<td>28 (82.35%)</td>
</tr>
<tr>
<td></td>
<td>Nursing diploma</td>
<td>6 (17.65%)</td>
<td>1 (2.94%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bachelor of nursing</td>
<td>5 (14.71%)</td>
<td>5 (14.71%)</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Gender, Σ (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>24 (70.59%)</td>
<td>21 (61.76%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>10 (29.41%)</td>
<td>13 (38.24%)</td>
<td></td>
</tr>
</tbody>
</table>
The table above illustrates that the average of clinical supervision ability in the intervention group before training was 55.38 and after training was 89.85. While in the control group the average score of clinical supervision ability in the control group before training was 56.03 and after training was 57.06.

Table 3: The differences of ability the clinical supervision between intervention and control group before and after clinical supervision training

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>p-Value</td>
</tr>
<tr>
<td>Before</td>
<td>55.38</td>
<td>0.000</td>
</tr>
<tr>
<td>After</td>
<td>89.85</td>
<td></td>
</tr>
</tbody>
</table>

The table above showed that the value of clinical supervision ability before treatment in the intervention group was 55.38 and after treatment was 89.85. In the control group the average score of clinical supervision ability before treatment was 56.03 and after treatment 57.06. The results of analysis showed that there were significant differences related to implementation of clinical supervision before and after treatment in the intervention group (0.000). Whereas in the control group there was no significant difference regarding the ability of clinical supervision before and after treatment (0.153).

Table 4: The influence of clinical supervision among intervention and control group before and after clinical supervision training

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention group (n = 34)</th>
<th>Control group (n = 34)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean difference</td>
<td>Mean difference</td>
<td></td>
</tr>
<tr>
<td>The influence of clinical supervision training</td>
<td>34.47</td>
<td>1.03</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The table above described that the differences in mean in the intervention group was 34.47 and the control group was 1.03. The results of the analysis concluded that there was an influence of clinical supervision training on the clinical supervision abilities of supervisors at Ulin General Hospital Banjarmasin (p=0.00).

Discussion

The results of the analysis of clinical supervision abilities before being given training in the intervention group and the control group showed poor results. The range of values of 50-60 with an average value of 55.38 before being given treatment in the intervention group was low. It still needed an increasing value of 44.62 to achieve the maximum value of clinical supervision capabilities by the supervisor.

The observation result before being given treatment showed that most supervisors did not comply with the guidelines in carrying out clinical supervision implementation, such as the clinical supervision that they did: 1) unscheduled, 2) unclear targets, 3) no bait behind, 4) which was undocumented 5) was not sustainable. It cannot provide objective information related to the implementation of activities based on a predetermined standard.

There was a significant difference regarding the ability of clinical supervision before and after clinical supervision training (0.000) in the intervention group. This was in contrast with the control group where there
was no significant difference between before and after the intervention (0.153). This proved that the training about effective clinical supervision improved the clinical supervision capabilities of the supervisor. Another research also stated that there were differences between groups that got training and the control group that did not get clinical supervision training (0.001) and found the influence of supervision on the ability of wound care performed by nurses. There was the influence of supervision training on the supervisor’s ability to supervise the implementation of patient safety. The intervention group and the control group gave different responses based on the presence or absence of stimulus in the form of clinical supervision training. This showed that through clinical supervision training, it was proven effective to improve the ability of supervisors to carry out clinical supervision.

Supervisors need cognitive, affective and psychomotor skills. This can be achieved by attending education and training. Supervisors also need to get special education or training to effectively carry out clinical supervision activities. They need good knowledge, including communication, motivation, guidance, direction, leadership, and experience. Moreover, they can carry out the clinical supervision well and according to a purpose. Head nurses and supervisors who have received clinical supervision training have been shown to improve their ability in clinical supervision activities.

The training plays an important role in an organization to improve the ability of managers. They are able to carry out their duties and functions well. Clinical supervision ability for supervisors needs to be developed through supervision training that will improve cognitive, affective and psychomotor abilities. It impacts productivity and or outcomes as expected. Clinical supervision training provides a good change, indicated by changes in knowledge of supervisors after training with almost perfect scores on post-test and passed for evaluating the results of supervision practices. The clinical supervision training is an important part in improving the ability of the supervisor to carry out the clinical supervision properly. The factors that influence the application of patient safety are directional functions, and primarily supervision activities by the manager. The ability of nursing managers is required to be able to carry out the function of direction for a manager through supervision activities to ensure the ability of nursing services.

The results of the analysis showed that in the intervention group there was an increase in the average value of 34.47, while in the control group the average value increased by only 1.03. This proved that there was an influence of clinical supervision training among supervisors on clinical supervision abilities at Ulin General Hospital Banjarmasin (0.000). The aim of the training was to improve the ability of supervisors to implement their main tasks. It should implement the clinical supervision of nurses in the ward to create a conducive work climate, support and motivate, and be effective on patient safety application.

Training is an effort to improve technical, theoretical and conceptual capabilities and employee morale in accordance with the needs of work or position through education and training. Education and training are the same as development, namely the process of improving both technical and managerial work skills. One of the indicators of the success of training can be seen from the initiative of employees who are trained. After participating in the training, employees can independently do what they have been taught and try to develop their creativity. To get reliable organizational performance, the process of human resource management needs to be properly implemented. There are three activities in the process of human resource management, namely: 1) Ensuring that competent employees can be identified and selected; 2) Providing up to date knowledge and expertise; 3) Ensuring that the organization maintains competent and well-performing employees who are able to continuously produce high performance.

The training in this study was conducted over 7 weeks. It was too early to accept behavioural change to be optimal. Someone who gains knowledge has it impact upon their behavioural change in providing services to patients. In its implementation, the supervisor has not explored all of his abilities in carrying out clinical supervision. It is limited by the grace period of the study.

This is in accordance with Lewin’s theory of change which suggests that a person needs to move into a new state. Supervisors who have information need to find out the changing stages. This is, namely, by providing good information, assisting in the implementation, assisting in solving problems and conducting feedback and continuous coaching efforts to supervise nurses. Therefore, it should be noted by policymakers to always meet the needs of the supervisor and education of the room supervisor in an effort to improve the ability of clinical supervision.
Conclusion

There were differences in clinical supervision abilities before and after training in the intervention group (0.000) and the control group (0.153). Hospitals need to improve the implementation of clinical supervision by programming education and training activities. It can be carried out continuously by all supervisors to improve the quality of care and work performance of nurses at the hospital.

Ethical Clearance: This study was approved by the Ulin General Hospital International Review Board (IRB) with number 004/III-RegRiset/ RSUDU/16.

Source of Funding: There was no funding support for this research; the authors used self-funding to conduct the research.

Conflict of Interest: None

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Feeding Patterns of Children with Stunting Based on WHO (World Health Organization) Determinant Factors of Behaviours Approach

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ABSTRACT

The stunting of children is a problem that is happening in Indonesia. Stunting can be caused by several factors, one of which is the feeding pattern of the child applied by the mother. The purpose of this study was to analyse the factors related to feeding patterns on children with stunting. This research design used a cross sectional study. There were 136 respondents (mother and toddlers) in this study who were chosen by simple random sampling. The independent variables were knowledge, attitude, personal reference, and income, while the dependent variable was feeding patterns. The data were collected by Infant and Young Child Feeding (IYCF) questionnaire then analysed by using ordinal regression. The result showed that there were relationships between health workers and posyandu cadres (p=0.001), and income (p=0.00) with feeding patterns. It can be concluded that the feeding patterns in children with stunting could be influenced by health workers, posyandu cadres and parent’s income. Income was the most influential factor with the pattern of feeding (estimated 15.4). This was because the higher the income, the greater the variety of food items that could be purchased by the mother. Personal references were used to enhance preventive and promotive efforts to provide health education to the mother.

Keywords: stunting, feeding pattern, behaviour, children

Introduction

Child stunting is a problem in Indonesia. Children with stunting describe poor linear growth, because the golden and critical period happens between the ages of 6-24 months. Based on one of the expected outcomes of the second purpose of Sustainable Development Goals (SDGs), which is to end every form of malnutrition by 2030, including a 2025 international target to reduce the number of stunting and wasting on children. However, to date the reduction in target has yet to be achieved. Stunting children in developing countries can be caused by an improper feeding pattern. Infants to three year olds are passive consumers. It means that they consume the meals that are provided by their mothers or nannies. Mothers should pay attention to the intake of nutrients consumed by their children, so their growth and developments are in accordance with their age.

The short-term effect on stunting children is increasing morbidity. The long-term effects that may occur in individuals and society are cognitive ability deficit, poor health and a decrease in productivity, and the increasing risk of degenerative diseases such as diabetes, it can also cause psychomotor, soft motor skills, and neurosensory integration problems. The effects caused by lack of nutritional intake are thin children, slow body growth, decreased level of intelligence, mental disturbance, and even death.

Child stunting prevention measures by the government by making policies to reduce the number of child stunting are in accordance with Health Constitution Number 36 of 2009 that is by improving food consumption patterns that correspond with balanced nutrition and nutrition conscious behaviour. The treatments are to reduce the number of child stunting by providing micronutrient supplements to balance protein in pregnant women, educating mothers to breastfeed...
their children for six months exclusively. Additionally, administering vitamin A to children who are above six months old. However, the government measures that have been done by now have not yet decreased the numbers of child stunting.9

The parents’ behaviour in feeding their children can affect the children’s nutritional status.10 The parents’ behaviour will develop when there is stimulus, either from within (internal), or from outside (external). WHO behavioural theory explains that there are lot of reasons for someone to behave. Therefore, the same behaviour among some people is caused by different backgrounds.11 The theory can be used to analyse both internal and external factors related to the mothers’ behaviour to feed stunting children, and the theory is easy to understand for analysing health behaviour.

Method

Study Design, Setting, and Sampling: This study was a descriptive analytic with cross-sectional study. The population of this study was mothers of children aged 6-24 months in the sub-district of Papar. There were 136 samples picked by using probability and cluster random sampling.

Study Variables: The independent variables were knowledge, attitude, references from people who are considered important (health workers and posyandu cadres), and family income. The data was collected using questionnaires, such as knowledge questionnaire, attitude questionnaire, and Infant and Young Child Feeding (IYCF) questionnaire, that have been tested for validity and reliability with the Cronbach Alpha test.

Data Analysis: The data was analysed by using ordinal logistic regression with significance level α=0.05.

Results

The majority of respondents were at the productive age between 20-35 years old, a total of 106 respondents (77.9 %). In terms of occupation, mostly they were housewives, a total of 100 respondents (80.9%), while their husbands worked day labour, a total of 48 respondents (35.3%). In terms of education 72 respondents (52.9%) were high school graduates. In terms of income, the majority of them have low income, a total of 94 respondents (69.1%) (table 1).

Table 2 shows that the majority of respondents had sufficient knowledge with low feeding patterns, a total of 33 respondents (24.2%). Statistical analysis with α < 0.05 was reported that knowledge (p=0.516) have no relation in feeding pattern to stunting children. The attitudes of the respondents were balanced between positive and negative, a total of 34 and 30 respondents. But most of them had positive attitude with low feeding patterns, a total 34 respondents (25%). Statistical analysis with α < 0.05 was reported that attitude (p=0.555) has no relation with feeding pattern to stunting children.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
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<td>Mothers’ age</td>
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<tr>
<td>&lt;20 years old</td>
<td>4</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>20-35 years old</td>
<td>1067</td>
<td>77.9</td>
<td></td>
</tr>
<tr>
<td>&gt;35 years old</td>
<td>26</td>
<td>19.1</td>
<td></td>
</tr>
<tr>
<td>Father’s job</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobless</td>
<td>1</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Day Labour</td>
<td>48</td>
<td>35.3</td>
<td></td>
</tr>
<tr>
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<td>32</td>
<td>23.5</td>
<td></td>
</tr>
<tr>
<td>Private Employee</td>
<td>46</td>
<td>33.8</td>
<td></td>
</tr>
<tr>
<td>Civil Worker</td>
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<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Others</td>
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<td>5.9</td>
<td></td>
</tr>
<tr>
<td>Mother’s job</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Housewives</td>
<td>110</td>
<td>80.9</td>
<td></td>
</tr>
<tr>
<td>Day Labour</td>
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<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>7</td>
<td>5.1</td>
<td></td>
</tr>
<tr>
<td>Private Employee</td>
<td>13</td>
<td>9.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Civil Worker</td>
<td>1</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Mother’s education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not graduate elementary school</td>
<td>1</td>
<td>0.7</td>
<td></td>
</tr>
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<td>Elementary school graduate</td>
<td>1</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Middle school graduate</td>
<td>19</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>High school graduate</td>
<td>37</td>
<td>27.2</td>
<td></td>
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<tr>
<td>Bachelor</td>
<td>72</td>
<td>52.9</td>
<td></td>
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<tr>
<td>Did not graduate elementary school</td>
<td>6</td>
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<tr>
<td>Family’s income</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>&lt; Rp 1.713.400</td>
<td>94</td>
<td>69.1</td>
<td></td>
</tr>
<tr>
<td>&gt; Rp 1.713.400</td>
<td>42</td>
<td>30.9</td>
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</table>
Table 2: The relations of knowledge, attitude, personal references, and income with feeding pattern to stunting children

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Very Good</th>
<th>Good</th>
<th>Enough</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Good</td>
<td>3</td>
<td>2.2</td>
<td>7</td>
<td>5.1</td>
<td>23</td>
</tr>
<tr>
<td>Enough</td>
<td>1</td>
<td>0.7</td>
<td>8</td>
<td>5.8</td>
<td>19</td>
</tr>
<tr>
<td>Less</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>2.9</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>2.9</td>
<td>19</td>
<td>13.8</td>
<td>49</td>
</tr>
</tbody>
</table>

Ordinal Regression Test Sig (p) = 0.516

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Very Good</th>
<th>Good</th>
<th>Enough</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Positive</td>
<td>1</td>
<td>0.7</td>
<td>11</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>Negative</td>
<td>3</td>
<td>2.2</td>
<td>8</td>
<td>5.8</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>2.9</td>
<td>19</td>
<td>13.9</td>
<td>49</td>
</tr>
</tbody>
</table>

Ordinal Regression Test Sig (p) = 0.555

<table>
<thead>
<tr>
<th>Health Workers and Posyandu Cadres</th>
<th>Very Good</th>
<th>Good</th>
<th>Enough</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Positive</td>
<td>3</td>
<td>2.2</td>
<td>15</td>
<td>11</td>
<td>29</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
<td>0.7</td>
<td>4</td>
<td>2.9</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>2.9</td>
<td>19</td>
<td>13.9</td>
<td>49</td>
</tr>
</tbody>
</table>

Ordinal Regression Test Sig (p) = 0.001

<table>
<thead>
<tr>
<th>Income</th>
<th>Very Good</th>
<th>Good</th>
<th>Enough</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
<td>0.7</td>
<td>14</td>
<td>10.3</td>
<td>34</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
<td>2.2</td>
<td>5</td>
<td>3.6</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>2.9</td>
<td>19</td>
<td>13.9</td>
<td>49</td>
</tr>
</tbody>
</table>

Ordinal Regression Test Sig (p) = 0.000

Table 3: Determinant Ordinal Regression Model of Feeding Pattern to Stunting Children

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min-Max</th>
<th>Mean</th>
<th>SD</th>
<th>Estimate</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>12.5 – 100</td>
<td>73.89</td>
<td>18.28</td>
<td>-0.32</td>
<td>0.516</td>
</tr>
<tr>
<td>Attitude</td>
<td>43.75 – 96.88</td>
<td>74.83</td>
<td>8.49</td>
<td>-0.2</td>
<td>0.555</td>
</tr>
<tr>
<td>Health Workers and Posyandu Cadres</td>
<td>25 – 100</td>
<td>66.94</td>
<td>22.89</td>
<td>1.11</td>
<td>0.001*</td>
</tr>
<tr>
<td>Income</td>
<td>1 – 2</td>
<td>1.3</td>
<td>0.46</td>
<td>15.4</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

The majority of the respondents had references from health workers or public figures (posyandu cadres) which were negative with a low feeding pattern, a total of 38 respondents (27.9%), statistical analysis with α 0.05 was reported where health workers and posyandu cadres (p=0.0001) had a relationship with feeding patterns to stunting children.

The majority of respondents had a low income as well as low feeding patterns, a total of 45 respondents (33%). Statistical analysis with α < 0.05 reported that the parents income is related to feeding patterns in stunting children. The dominant factors were related to feeding patterns in stunting children, where the value (p=0.000) compared to the other variable with magnitude of influence indicated by value (estimated: 15.4) shows that it is 15.4 times riskier at influencing feeding patterns to stunting children than knowledge, attitude, and personal references (table 3).

Discussion

The respondents have good knowledge about the benefits of feeding pattern to children. The results of this
study are supported by the research by S Notoatmodjo and F Isnantri et al., which showed that there is no relationship between knowledge and feeding patterns.\textsuperscript{12,13} Mothers have good knowledge about child feeding, but not many of them have applied their knowledge, such as giving various kind of food to their children and introducing foods to their children from an early age.\textsuperscript{14} The family’s economic condition is the main reason why mothers serve the meal, therefore their children get less various food or smaller portioned meals.\textsuperscript{15,16} Food consumption rate is influenced by the income and food product price. High income will determine the quality and quantity of food purchased.\textsuperscript{17} The family’s economic condition is the main reason why mothers serve their family’s meal.\textsuperscript{16}

One of the factors that affecting knowledge is the level of education.\textsuperscript{18} A small portion of respondents are elementary school graduates. The elementary school graduate respondents have less knowledge - 10 out of 21 respondents. Less knowledge is influenced by the level of education.\textsuperscript{19} The level of education will help mothers in acquiring knowledge, understanding, and helping them to think more rationally in absorbing information. Knowledge is influenced by a person’s age.\textsuperscript{11} The majority of respondents are at a productive age between 20-35 years old, a total of 106 respondents (77.9%), at that age a person can absorb information well. People with the ages between 20-35 years old can understand information well.\textsuperscript{12}

The majority of the respondents have a positive attitude in feeding patterns, as evidenced by agreeing to wash their hands before feeding their children, so that the highest score is obtained, while the lowest score was obtained from the respondents that will not force their children if they did not want to eat. Contrasted with a study by NZ Rakhmawati et al. and P Hearty et al., stated that there are positive relationships between attitude and consumption behaviour.\textsuperscript{14,20} Attitude has three components that can shape behaviour and which are influenced by knowledge, thinking, beliefs, and emotions. Attitudes do not always materialise to an action, supporting factors such as family are needed so that actions can be materialised.\textsuperscript{3}

Attitude is a person’s closed response to a stimulus or certain object, which involves the factors of opinion and emotion of the concerned person (correct-incorrect, agree-disagree, pleased-unpleased, etc). Based on this study the majority of respondents have a positive attitude with low feeding patterns which means that the attitude in inversely proportional. Less attitude will achieve a good feeding behaviour. The mothers’ positive attitude does not necessarily lead to a better feeding pattern. It is because the attitude is a closed response and not an action or activity.\textsuperscript{14}

Personal references (health workers and posyandu cadres) are related to children’s feeding patterns. Human behaviours are deeply influenced by the people that are considered important around them, and what they say or do tends to be emulated.\textsuperscript{21} Supporting factors are needed to realize attitudes into real behavior.\textsuperscript{22} Those factors include facility and support from other parties, which is a personal reference in a living environment. The success of the mothers in carrying out the right feeding pattern requires the role of health workers.

The majority of respondents have low incomes as well as low feeding patterns. Income is the most influential factor in feeding patterns to stunting children. The increase of household income give mothers chances to improve the quality and variety of food purchased.\textsuperscript{23} There is significant relationship between income and feeding. The less the income then the less variable the food options.\textsuperscript{24} Variations in consumption of fish are related to economic status, and can cause stunting in children.\textsuperscript{25} Diets low in dairy and meat can cause children to have growth problems.\textsuperscript{26} The family’s income will affect mothers’ attitude in serving meals for their family, especially their children.\textsuperscript{27}

The job characteristics of someone can reflect income, social status, and socio-economic status.\textsuperscript{28} The working status of someone also influences someone’s ability to maintain their health by doing medical check-ups regularly. It is concluded that the income obtained by the respondents are motivated by someone’s work.

**Conclusion**

Based on this study, knowledge are not always influenced by proper feeding patterns. Increased knowledge is not only obtained from formal education but also from informal education. Attitude may not immediately be materialised into an action. There are influencing and supporting factors needed, such as personal experience, cultures, other people that are considered important, mass media, educational and religious institution, also
emotional factors of individuals and family. Therefore, income significantly impacts on feeding pattern because it affects an improper feeding pattern.

**Ethical Clearance:** This study did not use animals and does not mention the identity or medical record of the respondents. The ethical approval for this study was granted by the IRB committee of the Faculty of Nursing at the Airlangga University no.1221-KEPK.

**Source of Funding:** This study and publication was self-funded by the authors.

**Conflict of Interest:** There is no potential conflict of interest over the publication of this article.

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The Relationship of the Role of Teachers in the Implemented Curriculum of School-Based Disaster Preparedness in Vulnerability in School Teachers with Disabilities in Malang City, Indonesia

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ABSTRACT

The students are the group most vulnerable to disasters, especially children with disability. Teachers should have the skills to handle disasters when they occur. The low preparedness of School-Based Disaster Preparedness/Sekolah Siaga Bencana (SSB) teachers in disaster risk reduction can lead to increased vulnerability of teachers in dealing with disaster threats. This study was conducted to analyse the relationship of the role of the teachers in the implemented curriculum SSB in Vulnerability of school teachers with disability in Malang City. This research is a quantitative study, using correlative analytic observational design and cross sectional approach with a sample of 30 teachers taken from elementary schools and junior high schools with disability. The results of bivariate analysis using gamma correlation test obtained the results of knowledge factors (p = 0.005; r = 0.47) attitude (p = 0.000; r = 0.75), means of infrastructure (p = 0.000; r = 0.98), and disaster information (p = 0.000; r = 0.59) for SSB teachers’ preparedness.

Keywords: Knowledge, attitude, curriculum, teachers, School-Based Disaster Preparedness, Vulnerability

Introduction

Preparedness is an important element and part of disaster management.¹ Building such a culture requires innovative, economic, logical, human-oriented, and needs-oriented interventions.² School is one of the main stakeholders responsible for building preparedness. According to Takahashi, besides being the source of knowledge, schools have several strategic roles in building preparedness, such as being the source of knowledge, dissemination of disasters, being participatory educational centres for communities, providing practical guidance on what to prepare before disasters, and actions which should be done during and after the disaster.³ So, school readiness becomes crucial in improving public preparedness.⁴

In the World Conference on Disaster Risk (United Nations International Strategy for Disaster Reduction [UNISDR]; Geneva, Switzerland), it was proposed that comprehensive school safety consists of three pillars: (1) safe school facilities, (2) effective school disaster management and disaster risk reduction (DRR), and (3) endurance education.⁵

The establishment of Sekolah Siaga Bencana/SSB (School-Based Disaster Preparedness) is a preparedness effort for facing disasters in schools, which is the implementation of the Hyogo Framework 2005-2015. School-based disaster preparedness is a school that has the capability of managing disaster risks. These capabilities are measured by having disaster management planning (before, during, and after a disaster); availability of logistics; security and comfort in education; infrastructure and emergency systems supported by knowledge and skills of preparedness; standard operational procedures; and early warning systems.⁶ A study by Lesmana and Purborini indicated that the level of SSB preparedness is still low, in terms of knowledge, attitude, and actions undertaken by SSB in DRR.⁷
Method

Participants and Procedure: The recruitment of participants used simple random sampling. Participants consisted of the teachers who teach students with disabilities. This research was conducted on (n=30) teachers agreeing to join in this research. The independent variables were upholding knowledge, skill and competence while the dependent variable was the level of disaster preparedness.

Instrument: This research is quantitative, conducted by using observational analysis with a cross-sectional approach. The setting of the study were SDLN and SMP LB of which the location was Malang City, Indonesia. This study was carried out from August to November, 2018. The population was 30 teachers from two school SSB in Malang, and the sample size in the study was 30 teachers in SSB taken from grades five and six with a purposive sampling technique. The uni-variate was conducted to identify characteristics of the respondent, bi-variate analysis was conducted to describe the relationship between knowledge and attitude with SSB teachers’ preparedness to deal with the disaster, using gamma correlation test with significance level ($\alpha$) = 0.005; and multi-variate logistic regression was used to see how much influence knowledge and attitude had towards teachers preparedness SSB.

Statistical Analysis: The data was analysed by SPSS version 21. Multiple linear regression was used to identify how far the contribution of upholding trust, compassion, and competence variable was to patient satisfaction. The redundancy variable in this research is socio-demographic factors such as: sex, education, job, and age. Pearson correlation analyses were used to view the correlation between socio-factor and patient satisfaction. The significant level applied was $p < 0.05$.

Result

Socio-demographic characteristics of the respondents: Based on the data obtained from the results of the study, the general characteristics of respondents based on age, gender, training experience, knowledge, attitude, and preparedness were as follows.

Table 1: Distribution of Respondents by Age in SDNLB Kota Malang and SMP LB Malang City

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
<th>Mean</th>
<th>SD</th>
<th>Min-Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>30</td>
<td>100.0</td>
<td>11.68</td>
<td>74</td>
<td>36-48</td>
</tr>
</tbody>
</table>

Source: Primary Data (2018).

As Table 1 indicates, from 30 respondents, the average respondent was 36-48 years old with standard deviation of 74. The youngest age was 26 years and the oldest age was 48 years.

Table 2: Distribution of Respondents by Gender and Training Experience Teachers preparedness

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Amount</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>33.33</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>66.67</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Training Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>25</td>
<td>83.33</td>
</tr>
<tr>
<td>Once</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Twice or More</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2 illustrates that the number of male teachers was almost equal to that of the female teachers; the number of male teachers was 10 (40%) and the number of female teachers was 20 (60%). Meanwhile, based on training experience, more than one-half of the teachers never had disaster training (73.4%). This was due to the absence of training programmes related to disaster preparedness for teachers from the government, schools, and private parties.

Table 3: Distribution Respondent by Knowledge Variable, Attitude, and Teacher’ Preparedness

<table>
<thead>
<tr>
<th>Variable</th>
<th>Amount</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>13</td>
<td>46.8</td>
</tr>
<tr>
<td>Good</td>
<td>17</td>
<td>53.2</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>13</td>
<td>46.8</td>
</tr>
<tr>
<td>Positive</td>
<td>17</td>
<td>53.2</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
<tr>
<td>Preparedness for Disaster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Ready Yet</td>
<td>16</td>
<td>59.6</td>
</tr>
<tr>
<td>Ready</td>
<td>14</td>
<td>40.4</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data (2018).

Data from each variable are presented in Table 3. The result of the uni-variate analysis showed that from 16 respondents, more than one-half of the teachers had good knowledge (53.2%) with a positive attitude (53.2%). Overall, the SSB teachers preparedness in Malang City was still low (59.6%).
Table 4: Results of Bi-variate Analysis Gamma Correlation Knowledge Relation to SSB Teachers Preparedness in Earthquake Disaster Risk Reduction

<table>
<thead>
<tr>
<th>The Preparedness of Teachers</th>
<th>Less</th>
<th>Ready</th>
<th>P Value</th>
<th>(r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>14 72.5</td>
<td>4 27.5</td>
<td>0.47</td>
<td>.007</td>
</tr>
<tr>
<td>Good</td>
<td>16 48.3</td>
<td>26 51.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 59.6</td>
<td>30 40.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data (2018).

From Table 4, P value of .007 was obtained, less than alpha (5%), indicating that there was a significant relationship between knowledge and the preparedness of SSB of teachers in Malang city. The correlation value of 0.47 showed a positive correlation.

Table 5: Results of Bivariate Analysis Gamma Correlation Attitude Relation to SSB Teachers Preparedness in Earthquake Disaster Risk Reduction

<table>
<thead>
<tr>
<th>The Preparedness of Teachers</th>
<th>Less</th>
<th>Ready</th>
<th>P Value</th>
<th>(r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>12 82.4</td>
<td>4 17.6</td>
<td>0.75</td>
<td>.000</td>
</tr>
<tr>
<td>Good</td>
<td>6 39.7</td>
<td>8 60.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>18 59.6</td>
<td>12 40.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data (2018).

From Table 5, a P value of .000 was obtained, less than alpha (5%), which indicated that there was a significant relationship between attitudes and the preparedness of SSB teachers in Malang city. The correlation value of 0.75 showed a positive correlation.

Table 6: Results of Analysis Regression Logistic Factor Analysis That Influences the SSB Teachers Preparedness in Disaster Risk Reduction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sig.</th>
<th>OR (B)</th>
<th>Hosmer &amp; Lameshow</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>0.240</td>
<td>159</td>
<td>0.568</td>
<td>0.60</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.038</td>
<td>4.308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 6, it can be seen that attitude was the variable that had the greatest influence on preparedness, that is OR = 4.308; meaning, the attitude of “poor” teachers of SSB would cause the low preparedness of SSB teachers in DRR for disaster our times compared to SSB teachers who have a “good” attitude respondents in this research responded 100% after controlled knowledge variables. Knowledge became the second-factor affecting preparedness, with value OR = 159.

Discussion

Based on the results of the analysis of the knowledge variable, it was found that there is a significant relationship between knowledge and the preparedness of SSB teachers in DRR, with the significance of 0.007 less than alpha (5%) with correlation value of 0.47, showing a positive correlation with enough correlation strength. The results of the analysis show that more than one-half (53.2%) of SSB teachers have good knowledge of DRR. Most of the teachers are able to answer all questions correctly in the knowledge questionnaire.

According to the researchers’ assumption, the above-average knowledge of SSB teachers is because education about disasters is given to SSB teachers. The teachers are taught about the types of disasters, signs of disasters, the need to save themselves the right way, the place of evacuation in the event of an earthquake, early warning systems in schools, and emergency equipment brought in anticipating risk reduction of earthquake disasters. The results of this study are in line with the results of research conducted by Thomas which suggests that knowledge of respondents will be related to the level of preparedness of individuals in facing disasters. Meanwhile, the research of Pathirage, et al. also indicates that preparedness is influenced by one’s knowledge of disasters and the obtained training experience.

This is because knowledge is an intellectual aspect that is closely related to all that is known by the man himself. Knowledge gained is an accumulation of education given to a person, both formally and informally, which will support someone in solving a problem. This is because of knowledge-oriented intelligence, thinking power, and knowledge, as well as the understanding of someone.

Efforts to disseminate information that can be useful for the community in building preparedness should be based on sound knowledge. In this case, the school becomes a source of information for SSB teachers in increasing knowledge, so that the knowledge given must
be innovative, economical, logical, human-oriented, and needs-oriented.\textsuperscript{14} It appears that most of the rehabilitation is driven by multi-lateral international organizations and nongovernmental organizations (NGOs) that dedicate resources in the education sector (i.e., the fifth in the overall sectoral allocation of post-disaster recovery funds), including school reconstruction and DRR education, in the hope of creating long-term impacts and providing an efficient prevention scheme.\textsuperscript{15} One form of DRR is an effort to increase knowledge; a lack of knowledge can factor into interactions that can lead to increased casualties and material losses. This is due to a lack of understanding of hazards, resulting in unpreparedness and powerlessness in facing these threats.\textsuperscript{14}

Based on the result of the analysis on the attitude variable, it was found that there is a significant correlation between knowledge and the preparedness of SSB teachers in DRR, with the significance of .000 less than alpha (5%), with correlation value of 0.75, showing a positive correlation with correlation strength. However, it should be acknowledged that the positive or negative attitudes have confounding factors that can influence a person to behave, such as previous experience, education level, region, and disaster knowledge. The study of Codreanu, et al. also indicates that someone who has a positive attitude tends to be calmer in facing disaster threats.\textsuperscript{15}

Although most SSB teachers have a positive attitude, there are SSB teachers who have negative attitudes toward preparedness, who are mostly less prepared for DRR. According to Azwar, many factors can influence a person to behave towards the object of attitude, such as personal experience, which is the basic factor in the formation of attitudes.\textsuperscript{16} Therefore, personal experience must leave a strong impression. Attitude will be easily formed if it involves emotional factors. The personal experience that SSB teachers have in coping with the disaster in Malang city is a solid foundation for teachers to have a positive attitude in DRR. However, the experience of teachers in dealing with disasters is not a major factor in shaping awareness of preparedness, but must be supported by good disaster education.\textsuperscript{17}

However, there is also a Java culture called Lindu assuming that the coming disaster is a form of soil fertility and fruits. This way of viewing can certainly hinder the attitude of the community to be prepared for DRR. This culture is slowly eliminated by the increased knowledge of teachers and communities related to disasters. The success or failure of disaster management depends on the involvement of culture, traditions, and customs. It is important to consider the cultural context of the affected regions, such as customs, traditions, local practices, and ethnic composition of a region for effective and easy implementation.\textsuperscript{18}

It is very important for the achievement of preparedness to be improved, especially in areas that are at a high risk of disasters. The Malang area is one of the more potentially earthquake-prone areas.\textsuperscript{19} Learning activities are interactive, inspiring, and challenging, motivating learners to participate actively and providing sufficient space for an initiative, creativity, and independence according to the talents, interests, and physical and psychological development of learners. These activities are carried out systematically through exploration, elaboration, and confirmation processes to form a positive attitude.\textsuperscript{20}

In addition, there are no vehicles and special lanes to mobilize teachers quickly in the event of an earthquake, considering that one of the schools, SDLB, displays vulnerability. So, the potential for disaster impact is a very high. Therefore, the functions and responsibilities of schools and teachers in emergency situations become an important point in DRR at schools, so that competent human resources are needed.\textsuperscript{21}

While comprehensive DRR initiatives should not be confined to infrastructure alone, they should cover a wide range of issues, such as representing the schools of thought in science, engineering, structural, and physical organization, since infrastructure plays an important role in reducing vulnerability of risky communities, such as schools.\textsuperscript{22}

**Conclusion**

There is a significant relationship between knowledge and attitude with SSB teachers’ preparedness in DRR in Malang city. The results of this study can be used as feedback to solve the problem of SSB teachers’ lack of preparedness in school-based DRR. Prevention and preparedness efforts cannot stand alone. The government should be cautious in utilizing the concept of SSB as a DRR by innovating and improving teachers’ knowledge of disasters and encouraging a positive attitude for preparedness.
Ethical Clearance: The ethical approval for this study was granted by Health Research Ethic Committee of Brawijaya University (Number 016/KEP/FK 2018).

Source of Funding: This study received funding support from the Ministry of Education, Indonesia. The funding source was not involved in study design, data collection, analysis or interpretation; in the writing of this report; or in the decision to submit the article for publication.

Conflict of Interest: None

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The Effect of the Health-Trace Map Game towards Motivation on a Clean and Healthy Life Style among Street Children in Surabaya

Pipit Festy W, Sanda Marta Ari Firmansyah, Yuanita Wulandari, Fathiya Luthfil Yumni

1Faculty of Health Sciences, Muhammadiyah University of Surabaya

ABSTRACT

Street children generally live in a less supportive environment, with inadequate facilities and infrastructure, and a lack of health information. These make street children vulnerable to health problems. Increasing motivation for a clean and healthy lifestyle in street children is a good solution to maintain their health. The Heath-Trace Map game is a learning media that can be used as motivation. The aim of this study was to analyse the effect of the Health-Trace Map game as health education media towards motivation on clean and healthy lifestyles among street children. The One Group Pre-Post Test design was used in this study. 30 street children had joined this study. The Wilcoxon Sign Rank Test with a significant level of \( \alpha < 0.05 \) was performed to analyse the data. The results showed the \( p \) value = 0.000 ( \( p \) value < \( \alpha = 0.05 \)), from which it can be concluded that the Media Health Trace Map Game had an effect on increasing the Motivation of Clean and Healthy Life Behaviour among Street Children in Surabaya.

Keywords: Children, health, media, motivation

Introduction

The economic crisis situation triggered the emergence of one of the social population problems in Indonesia’s big cities, namely the emergence of the phenomenon of the existence of street children. Street children come from poor families, most of whom have experienced a lack of attention and affection from parents and family. The impact of street children can lead to the emergence of thuggery, various diseases, disruption of traffic and comfort of road users, disruption of the beauty and order of the city, crime vulnerability, a neglected education, and even dropping out of school. Problems with street children can cause health problems, one of which is that the health of street children living outside the home has not been fulfilled, namely the lack of healthy behaviour because of the physical and psychological needs of street children with limited facilities and infrastructure, such as living in a far from clean concept (without environmental support), inadequate infrastructure, incomplete facilities. A lack of information makes street children vulnerable to disease.

Based on data from the Ministry of Social Affairs, it is noted that the number of street children in Indonesia reached 16,290 street children. Surabaya, as one of the metropolitan cities in Indonesia, also has not escaped a population of street children. In Surabaya it is shown that there was a significant increase in the number of street children in 2010, with 80 people, in 2011 there were 45 people, in 2012 there were 114 people, in 2013 there were 94 people and in 2014 there were 76 people, in 2015 there were 85 souls of street children. Whereas, in 2014, the number of street children decreased but it was not significant but, in 2015 it experienced an increase again. This shows that the volume of street children from year to year is not stable and the problem needs serious handling from various parties.

The needs of all children are increased, such as educational needs. One effort that can be done to educate street children is to increase PHBS by doing health promotion, since street children need knowledge and motivation about PHBS. By knowing about PHBS, street children will care more about their health.

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Schools or communities, as one of the targets of PHBS in educational institutions, need to get attention given to the large number of school age children, which is 30% of the total population of Indonesia. The period of elementary and junior high school is a period that needs to be instilled in PHBS values and has the potential as an agent of change to promote PHBS both in the school, family and community environments so as to later create quality human resources (MenKes RI, 2011). The impact if there are less PHBS on street children is that most of them are exposed to contract various diseases (such as diarrhoea, tooth decay, skin disease, ear disorders, helminthiasis), learning environments that are not supportive and which reduce enthusiasm and learning achievement in school.¹

The researcher invited street children to understand the counselling material provided by the Health-Trace Map game method that was different from previous research. That previous research suggested that the application of the Course Review Horay Method had an effect in increasing the average value of knowledge, attitudes, and practices on Clean and Healthy Behaviour (PHBS) in Saptorenggo Elementary School 05, Pakis District, Malang Regency.²⁻⁷ Whereas research that suggests that health education through the Kasugi Card game 3 times affects the increase in knowledge of clean and healthy behaviours, which are the same as students getting 3 times the amount of health education through the lecture method carried out in grade 5 elementary school students in West Bandung Regency.⁸

The Health-Trace Map is a rectangular adventure game played in groups (3-5 people). This game, which aims to train physical skills and cognitive abilities and motivation of children in this game, is very easy and also fun. Therefore, the learning model of the Health-Trace Map game is one of the learning models that can create an exciting and fun atmosphere. Fun learning must consider children as subjects. These comforts include children who are not depressed, accept learning in a relaxed manner but remain focused, have the freedom to ask questions and opinions, get gifts (rewards) that motivate them to be able to change PHBS.

Method

Study Design, Setting and Sampling: The type of research used is the Pre-Experimental design method using the One Group Pre Test-Post Test design approach with samples taken using Non-Probability Sampling, namely Total Sampling. The population in this study were all street children of elementary school and junior high school in Cahaya Bunda Jembatan Merah Community, Pabean Cantikan-Surabaya, which numbered 30 children, while the sample was all street children from elementary schools in Cahaya Bunda Jembatan Merah Cantikan-Surabaya, which numbered 30 children starting April 22 - May 27, 2018.

The procedure of this study uses an instrument that is the game of the Health-Trace Map and question questionnaire sheets made by the researchers themselves who have tested validation and reliability with Cronbach’s Alpha = 0.759 with 13 questions that have been modified by researchers using the Likert Scale (Strongly Agree, Agree, Disagree, Strongly Disagree). There are 6 components of PHBS in schools that adjust to conditions in the field to measure motivation according to Herzberg’s theory which consists of intrinsic and extrinsic factors. A sheet about their motivation for PHBS was filled with scores 1-4 on positive and negative statements through health education with the Health-Track Map game. The data includes the motivation of street children to PHBS in schools that are adapted to environmental conditions such as washing hands with clean water and soap, eating healthy snacks, using clean and healthy toilets, not inhaling, weighing and measuring altitude every 6 months, and discarding garbage in its place. There are also SOP, SAK and leaflets in this study.

Results

This research was conducted at the Cahaya Bunda Pabean Cantikan-Surabaya Community from April 22 to May 27, 2018. From the total population determined the same as the sample number because the total sampling did not have inclusion and exclusion criteria, namely as many as 30 street children. The following general and special data obtained from the results of the study:

<table>
<thead>
<tr>
<th>No.</th>
<th>Age (Years)</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7 – 8</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>2.</td>
<td>9 – 10</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>3.</td>
<td>11 – 12</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>13 – 14</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>5.</td>
<td>15– 16</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Distribution of Respondents by Age in the Cahaya Bunda Pabean Cantikan-Surabaya Community in April-May 2018
Table 2: Distribution of Respondents in the Cahaya Bunda Pabean Cantikan-Surabaya Community in April-May 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Class</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1-2</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>2.</td>
<td>3-4</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>3.</td>
<td>5-6</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>4.</td>
<td>7-8</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Distribution of Respondents based on Residence Status in the Cahaya Bunda Pabean Cantikan-Surabaya Community in April-May 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Status of Residence</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>With Parents</td>
<td>25</td>
<td>83.3</td>
</tr>
<tr>
<td>2.</td>
<td>With Friends</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>3.</td>
<td>With Relatives</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>4.</td>
<td>Alone</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4: Distribution of Respondents by Gender in the Cahaya Bunda Pabean Cantikan-Surabaya Community in April-May 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Man</td>
<td>13</td>
<td>43.3</td>
</tr>
<tr>
<td>2.</td>
<td>Women</td>
<td>17</td>
<td>56.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6: Distribution of Motivation on Clean and Healthy Behaviour (PHBS) Before and After Health Education Intervention with Media was given Game Health-Trace Map in the Cahaya Bunda Pabean Cantikan-Surabaya Community in April-May 2018

<table>
<thead>
<tr>
<th>PHBS toward Motivation</th>
<th>Pre Test</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Medium</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td>Low</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on Table 7 above shows the results of research on respondents’ motivation before and after being given Health Education intervention on PHBS with Health-Trace Map media from 30 respondents getting motivation towards PHBS, street children before being given low category motivation assistance, 18 children (60%) and eliminating the decline to 2 children (6.7%) after being given an intervention. Street children before being given intervention were in the medium category, 10 children (33.3%) and decreased changes to 3 children (10%) were given intervention. Street children before being given a high motivation category intervention of 2 children (6.7%) and an increase in increase to 25 children (83.3%) after being given an intervention.

Discussion

A. Motivation about Clean and Healthy Life Behaviour (PHBS) Before Health Education was given with the Media Game Health-Trace Map on Street Children: Students who are often truant and have low learning motivation generally have parents with a level of poor and inconsistent involvement. The low level of involvement of parents can lead to not fulfilling the need for social support needed by children (vanBreda, 2015). With motivation to learn students will have energy that encourages consistency of learning. Students will also have clear learning goals and can choose activities that are not useful. These three functions simultaneously encourage student performance in learning and support achievement. The use of media is very appropriate to changing family behaviour for health attitude.
someone wants to work hard if there is hope to be realized into reality.

B. Motivation about Clean and Healthy Life Behaviour (PHBS) after being given Health Education with the Media Game Health-Trace Map on Street Children: The Health-Trace Map game has benefits that include: (1) providing knowledge and adding insight to children through the learning process of playing while learning about PHBS in schools, (2) stimulating the development of thinking power, creativity and language in order to be able to cultivate attitudes, mental, and good morals, (3) creating an attractive playing environment, providing security, and fun, (4) learning sportsmanship to recognize defeats and wins, (5) learning to work together and waiting for their turn, (6) honing social skills and closeness.

This is due to the implementation of a good Map Health-Trace game. Whereas in the Health-Trace Map game this is done 6 times in 1.5 months. To achieve success in conducting Health-Trace Map interventions by paying attention to several things, namely: (1) Each group consists of 3-5 children, because this game requires compactness to solve common problems, (2) Consists of various ages and mixed sexes in 1 group, in order to be able to discuss each other and resolve challenges that exist until the finish, (3) compactness and togetherness, to not fight each other and solve together.

Based on the results of research after being given Health Education with Media Games Health-Trace Map the desire for street children mostly increases because this game is a good medium to increase the motivation of street children because in this process street children can exchange ideas and practice to study fellow friends who become their problems so that street children expressed their desire to change to do Clean and Healthy Life Behaviour (PHBS) which at first they were lazy to do.

C. Effect of Health Education on Motivation about Clean and Healthy Life Behaviour (PHBS) Before and After the Intervention with the Media Game Health-Trace Map on Street Children: The Health Education process increases understanding to achieve the desired goals, without high motivation it will enable a good Clean and Healthy Life (PHBS) to arise. According to (Atikah & Eni, 2012) PHBS at school is a set of behaviours practiced by students, teachers, and the community in the school environment on the basis of awareness as a result of learning, so that they are able to prevent disease, improve their health, and play an active role in creating a healthy environment. Motivation is a person’s desires from within a person so that the person carries out certain activities to achieve a goal, the motive cannot be observed, which can be observed is the activity or perhaps the reasons for the action.

One of the benefits of learning media is to make children more attractive when receiving material so that it can foster learning motivation. The use of Health-Trace Map media used in the delivery of information will be more innovative, creative, effective, and interesting because there is interest from respondents towards the media used. The use of media that is different from usual which will arouse the interests or desires of respondents towards media and after that information will be easier to be absorbed, understood, and applied by children.

The results of street children motivation on Clean and Healthy Life Behaviour (PHBS) before being given Health Education intervention with Media Health-Trace Map Games showed that most street children still have low and moderate motivation and high motivation in only a few children but, after being given Health intervention Education with Media Games Health-Trace Map motivation of street children about Clean and Healthy Life Behaviour (PHBS) there is an increase in motivation of street children, mostly high and moderate motivation and low motivation for only a few children.

Conclusion

Based on the results of the study, there is an influence between Health Education and Media Health-Trace Map Game on Motivation about Clean and Healthy Life Behaviour (PHBS) in Street Children in Cahaya Bunda Komunitas Jembatan Merah Pabean Cantikan-Surabaya.

Ethical Clearance: The ethical approval for this study was granted by the KEPK University of Muhammadiyah Surabaya in 2018.
Source of Funding: This study received funding support by the internal fund from the University of Muhamadiyah Surabaya.

Conflict of Interest: None

REFERENCES


Promoting Spiritual Nursing Care in an Intensive Care Unit: A Systematic Review

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ABSTRACT

Most of the patients in intensive care units (ICU) are intubated. These conditions can affect the psychological, social and spirituality condition of the patients. The nurse’s role in terms of providing spiritual care is still not optimal. Many feel the urge to reach out to their patients and offer spiritual support, but they do not know how to do it. However, the procedure or intervention needed for providing spiritual care is still little known about. This study aimed to explain the nursing interventions that could be applied for promoting spiritual care based on the existing literature. The systematic review was guided by the PRISMA protocol. A comprehensive search was carried out on a selection of databases; PubMed (Medline), CINAHL, Scopus, Springerlink, ProQuest, EBSCOHost, Web of Science Clarivate Analytic and Science Direct. The searching of published studies was done comprehensively using several keywords: “spiritual nursing care” OR “spiritual care in ICU” OR “spiritual intervention” OR “spiritual AND nurse” OR “spiritual AND critically ill patients” OR “implement spiritual intervention”. The searches were limited to publications in English with the year of publication being from 2009 up to February 2019. Ten studies were included in the review. This review confirmed some of the ways to promote spiritual nursing care in the ICU. Nurses, in promoting spiritual nursing, need the ability to communicate effectively and also to collaborate with the patient’s family and/or chaplain. It is hoped that this review could be a reference for nurses to allow them to provide spiritual nursing care in the ICU.

Keywords: nursing, spiritual care, intensive care unit

Introduction

Patients who are in the Intensive Care Unit (ICU) are patients who have serious illnesses. Most of the patients in the ICU are intubated. These conditions can affect the psychological, social, and spirituality conditions of the patients. Patients who have these conditions become vulnerable to spiritual distress. The healing process and their coping mechanisms may be delayed if the patient is in spiritual distress and the nurse must utilize this to provide for the spiritual needs of the patient.

Despite evidence of the benefits from spiritual care, physicians and other health-care providers commonly fail to assess and address their patients’ spiritual care needs in the ICU. In some of the studies mentioned so far, the nursing role in providing spiritual care is still not optimal. Nurses in the ICU often emphasize physiological needs such as stabilizing the patient’s vital signs, and relieving the physiological symptoms. They rarely pay attention to the psychological and spiritual needs of the patients or their spiritual needs are often ignored.

A study revealed the differences in the nurses’ perception level regarding spiritual care and, consequently, in clinical practice. Although the results demonstrated positive perceptions of spiritual care, the participants rarely incorporated this care into their daily activities. Research has revealed that nurses rarely provide spiritual care needs for their patients. Most of the studies on spiritual care needs were focused on general wards. The studies on the spiritual needs of patients with critical illnesses were scarce and not well prepared. A survey focused on 123 ICU nurses from 4

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Turkey hospitals identified that the nursing perceptions and practices in relation to providing spiritual care were still inappropriate.⁹

The barriers for nurses providing such care have also been identified. Many feel the urge to reach out to patients and offer spiritual support but they do not know how to do so.¹⁰ The absence of spiritual care in patients may also be caused by the feelings of the nurses who lack the individual skills to carry out spiritual care.¹⁰ They were thus unable to meet the spiritual needs of their patients.¹¹

Spiritual care can improve the patient’s condition and also make the patients comfortable with their critical illness and it can even facilitate the patient’s death process.³ However, despite all of the attention given to the spiritual dimension, the majority of nurses still feel that they require more guidance and support from governing bodies to enable them to support and effectively meet their patients’ spiritual needs.⁷ Protocols or guidelines in clinical practice must be tailored to specific needs and beliefs.¹² This study aimed to explain nursing interventions that could be applied in promoting spiritual care based on the literature.

Method

The systematic review was guided by the PRISMA protocol (preferred reporting items for systematic review and meta-analysis).¹³

Identification of Studies: The search was carried out using the following databases: PubMed (Medline), CINAHL, Scopus, Springerlink, ProQuest, EBSCOHost, Web of Science Clarivate Analytic and Science Direct. The search of the published studies was done comprehensively using several keywords: “spiritual nursing care” OR “spiritual care in ICU” OR “spiritual intervention” OR “spiritual AND nurse” OR “spiritual AND critically ill patients” OR “implement spiritual intervention”. The searches were limited to having been published in English and where the year of publication was from 2009 up to February 2019.

Study Selection

1. Inclusion and exclusion criteria: Inclusion criteria were imposed as a part of the study selection: 1) intervention given by the nurse, 2) adult patients and 3) in the ICU setting. Studies falling under the following criteria were excluded from the review: 1) reviews and 2) epidemiology studies.

2. Quality assessment: The critical appraisal and study quality assessment were carried out by the authors independently and any discrepancies between the authors’ decision were resolved with consensus.

Results

From Figure 1, we can see that 112 studies were found from the electronic search. The first screening eliminated 62 articles because they were identified as duplicates. We continued to conduct the screening process based on language and the availability of the full text and 28 articles were excluded. The remaining 38 studies were screened based on the inclusion and exclusion criteria and 10 studies were included in the review. The ten studies that were included in the review can be seen in Table 1.

Figure 1: Study selection based on the PRISMA protocol
We can see that there are a wide variety of interventions given to the patients related to spiritual care. The majority of the interventions providing spiritual nursing care in the ICU were interactions between the nurse and patients, communication and collaboration with the family and/or chaplain.

Some of the kinds of intervention mentioned in the study revealed that spiritual care is integral care, and that it is not limited to spiritual rituals. Furthermore, it is interrelated with physical and psychosocial care. Communication is also an aspect in part of spiritual nursing care. Simple interventions like being with the patient, listening to them, asking open-ended questions related to their spirituality and beliefs, active spiritual practices and starting and maintaining a dialogue with the patient and families play an important role in providing spiritual nursing care. In providing spiritual care for critically ill patients in the ICU, nurses have to collaborate with the chaplain or with their family. Nurses also have to facilitate patients when conducting their prayers by helping the patients to pray or by reading holy scriptures. It was difficult to find a specific nursing intervention for providing spiritual nursing care in an intensive care unit, especially with critically ill patients. This review confirmed the findings that to provide spiritual nursing care in an intensive care unit, the nurses can follow roles such as (a) assessing the spiritual needs of the patients, (b) collaborating with the family or chaplains, (c) communication and (d) facilitating the patients when praying.

**Discussion**

The results of this systematic review have showed that to implement spiritual nursing care, nurses should not be limited to religious ritual activities. The forms of spiritual care that were found in this review can be initiated when assessing the patients spiritual needs. In the assessment phase the nurse listens to the patient and explores the patient’s spiritual problems. Together with the patients, they can allow them to express their experiences of pain, suffering or need, and listen to the patients express their emotions and anxieties as well such as depression, sadness, fear or loneliness, which can hinder their health physically, emotionally and spiritually. These actions can improve the nurses’ understanding of the patient’s spiritual needs. An accurate assessment is very important in order to determine the intervention that is to be used. The assessment of spiritual needs should be carried out with a systematic approach in which the nurses conduct assessment approaches in all aspects. Effective assessment depends on creating a relationship of mutual trust and respect for the values and beliefs that exist in the client.

In conducting spiritual nursing care, nurses also need to take collaborative steps with the patient’s family and chaplains. The patient’s family plays a major role in directing their patients’ spiritual care. Effective nurse-advisor collaboration is needed (especially given the current changes in the health care system) to provide adequate spiritual care. In addition, increasing the involvement of nurses and chaplains in the context of ethical issues tends to make nurse-chaplain collaboration even more important. The family has an important role to play in supporting and improving the patient’s health status. The nurses also have to collaborate and connect with religious leaders to provide spiritual care for the patients and their families. Knowledge of the differences in assessment between the nurses and religious leaders, any differing terminology and the role of the pastors will enhance this collaboration.

Spiritual care also includes respecting the religious beliefs and culture of the patients, and listening and talking with the clients and with the patients by caring for, supporting, showing empathy, facilitating participation in religious rituals, promoting a sense of well-being and referring them to chaplains. Praying is the main method by which the patients’ spiritual needs can be met. Prayer remains a safety net in both health and sickness. Prayer has a positive effect on psychological and physical well-being. Patients identify kindness and respect, talking and listening, and prayer as the most important aspects of their spiritual care. Praying with or for patients, spending time supporting and convincing the patients, listening to the patients verbalizing their fears and anxieties, showing respect for the dignity and spiritual beliefs of their religion, showing kindness and caring, arranging visits of spiritual/religious leaders and offering hope are all important.

Based on the results of the review, communication can be one form of spiritual care that the nurses can do in the ICU. Nurses who are able to communicate well with patients will have a positive impact. Spiritual communication is described as an important nursing role at the end of a patient’s life, and nonverbal
Communication, listening and discussing the patient’s emotions are emphasized as being important and effective nurse communication skills during spiritual care conversations.\(^2\) Spiritual communication is important to apply in the ICU. Nurses can assess and integrate the spiritual needs of the patients and their families into clinical care by engaging in spiritual care communication strategies.

**Limitation**

The systematic review was unable to conclude a specific spiritual nursing intervention available for conscious or unconscious patients.

**Conclusion**

Spiritual nursing care is not only limited to spiritual rituals. Simple interventions like open communication, helping the patients to pray and collaborating with the family and chaplain can be implemented in terms of promoting spiritual care in the ICU.

**Ethical Clearance:** Not Applicable

**Source of Funding:** None

**Conflict of Interest:** None

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Factors that Affect the Mother in the Control of Their Child’s Fever

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ABSTRACT

A fever is one of the signs and symptoms of disease that often occurs in childhood. Fever in children makes the mother frightened when facing her child’s health problems. The mothers assume that every child will develop a seizure fever. The purpose of this study was to find out the factors that influence the mothers when handling fever in the one of First Level Health Facilities in Jogoloyo, Sumobito and Jombang.

The research design was cross-sectional. The population of mothers with toddlers totaled 420 respondents. The sample of 210 respondents was gathered using a simple random sampling technique. The independent variables were factors that influenced the mothers in managing fever in toddlers and the dependent variable was the frequency of fever.

The results of the research show that 67% of the mother’s had good knowledge, the frequency of children with a fever was 45% and the mother’s who received advice from health workers was 87.3%. Good experiences from their family/friends made up 37.5%. Significant bivariate analysis was conducted on knowledge, the frequency of pain, advice from the health workers and their family/other people’s experiences with a p value < 0.05.

Advice from health workers consisted of health education about how to handle fever in children. This can increase the mother’s handling of feverish children, therefore structured education is very beneficial for the mother.

Keywords: maternal factors, fever management, toddler

Introduction

Children are in a phase where the body grows and develops physically, mentally, spiritually, in addition to their immune system. A child’s immune system can be obtained from internal and external factors. A child’s immune system with frequent illnesses, on the one hand, will be changed and the child will learn to adapt to the disease cycle.

A fever is an increase in temperature above the normal temperature limit caused by abnormalities or toxic substances in the central setting of the body temperature, the hypothalamus. A fever can be used as a sign of a change in a child’s health, such as it improving or worsening. Fevers are the most common in groups of children and it causes their parents to bring the children to the health services.1

Indonesia is a tropical country and almost all tropical diseases symptoms involve a fever. A fever is not an external and internal disease in its own right; a fever is a sign or symptom of an illness. Toddlers that are less than 5 years old are children who do not have a good immune system and so they will be more susceptible to disease. If the children often experience a fever, then this will impact on the quality of the children’s health as it can impair their growth and development. If the fever is not handled properly, then the child will experience febrile seizures because high temperatures will cause the release of an excessive electrical charge in the neuron cells of the brain.

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Fever involves different seizure thresholds for each child. Fever affects the ion and cell metabolism and ATP production. Every 1 degree increased will also increase their carbohydrate metabolism by 10-15%. The presence of fever will cause an increase in their glucose and oxygen requirements. A fever can cause tissue hypoxia including the brain tissue, which will have an impact on their lack of energy.

Some of the diseases that children often suffer from are fever, coughs, diarrhea, vomiting, chicken pox, measles and skin infections. Data from the National Health Survey in 2011 about the morbidity of infants and toddlers showed that 49.1% of infants were 1 year old, and 54.8% of infants were 1-4 years old. If a fever continues to increase, it will cause febrile seizures. At present, a fever is considered a common pain condition. A fever is also a condition that is often suffered by children. Almost every child has had a fever.

The incidence of fever often occurs in children (Jayanti, 2011). According to the World Health Organization (WHO), the number of cases of fever in the world are 18-34 million cases (Jayanti, 2011).

In Asia, around 10-15% of children have fever-associated symptoms or signs of illness (Grace, 2010). The results of the 2013 RISKESDAS showed that the incident rate of fever reached 37.2%. Prosil Jombang’s 2018 health study was ranked second in the outpatient cases at the puskesmas. In the first health facility of Dr. Heri Wibowo Sumobito Jombang, the majority were in cases of anemia where the child also came in with a fever. The statement from Lubis (2011) found that 31% of patient visits were caused by fever. Fever is a major complaint of the children being brought to the first-level health services or ED where nearly 70% of visits are ED. Fever generally makes all parents and caregivers suffer from phobias or fears.

Fever is considered to be a sickness that makes the children not want to eat or drink, and it gives them insomnia which will result in drastic weight loss. The most important thing is that the fever is a symptom of disease and that it is very serious (Rain et al. 2014).

Handling fever in children depends on the role of the parents, especially the mothers. Mothers are integrals part of the organization of households, in which their tendencies are to care for their children skillfully so then they can grow healthy. Mothers tend to have a good knowledge of fever and have a good attitude in relation to providing care for the best fever treatment for their children.

Method

Types of quantitative research: The cross-sectional design used a population of 420 mothers with febrile toddlers in 2018. The sample of 210 respondents was gathered using the simple random sampling technique. The independent variables were the factors that influenced the mothers with toddlers with a fever, dependent variable, maternal knowledge, the frequency of the fevers, getting advice from the health workers and the good experiences of the family/neighbors. Bivariate analysis was done using the Chi square test and the multivariate analysis used logistic regression. The place of research was a first level health care facility, Heri Wibowo Sumobito Jombang.

The research design was cross-sectional. The population of all mothers with toddlers was 420 respondents. The sample of 210 respondents used a simple random sampling technique. The independent variables were the factors that influenced the mothers in managing their toddlers with a fever and the dependent variable was the frequency of the fever. The bivariate analysis was conducted using a Chi square and the multivariate analysis used logistic regression.

Results

Table 1: Frequency Distribution Variables for the Factors that Influence the Mother in Handling A Toddler with Fever

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Less</th>
<th>Very Less</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Education</td>
<td>Elementary</td>
<td>1 (20)</td>
<td>1 (20)</td>
<td>3 (60)</td>
<td>5 (100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle School</td>
<td>23 (13.1)</td>
<td>85 (48.3)</td>
<td>40 (22.7)</td>
<td>28 (15.9)</td>
<td>176(100)</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>13 (48.1)</td>
<td>7 (25.9)</td>
<td>4 (14.9)</td>
<td>3 (11.1)</td>
<td>27 (100)</td>
</tr>
</tbody>
</table>
Conted…

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>95% CI</th>
<th>OR</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Elementary</td>
<td>0.08-1.12</td>
<td>0.32</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>0.18-1.24</td>
<td>0.44</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>≤ 30 years old</td>
<td>0.65-0.26</td>
<td>1.26</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>≥ 30 years old</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>Employed</td>
<td>0.41-1.76</td>
<td>0.74</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s age</td>
<td>≤ 1 years old</td>
<td>0.55-2.78</td>
<td>0.78</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>≥ 1-5 years old</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Boys</td>
<td>0.31-1.77</td>
<td>0.73</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td></td>
<td></td>
<td>0.68</td>
</tr>
<tr>
<td>Child’s Position in Family</td>
<td>First</td>
<td>0.11-1.67</td>
<td>0.76</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>&gt;first</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health’s officer advice</td>
<td>Ever</td>
<td>0.35-0.96</td>
<td>0.46</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td></td>
<td></td>
<td>0.03</td>
</tr>
<tr>
<td>Frequency of illness</td>
<td>Often</td>
<td>033-0.99</td>
<td>0.42</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td></td>
<td></td>
<td>0.31</td>
</tr>
<tr>
<td>Other’s people experience</td>
<td>Affected</td>
<td>0.38-0.49</td>
<td>0.39</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>Unaffected</td>
<td></td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Affected</td>
<td>0.37-0.49</td>
<td>0.32</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Unaffected</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P value < 0.05. Multivariate logistic regression analysis of the most influential advice from health workers. Knowledge, frequency of illness and family or other people’s experiences were found to be influential.
Discussion

Based on Table 1, it can be concluded that the factors that affect the mothers in handling fever in toddlers are as follows: the lower the mother’s education level, the more that the mothers are less able to handle their children with fever. Low education affects one’s thinking patterns. The lower a person’s education is, the slower they will be at getting information, especially information about handling fever in children.

Younger mothers will be better at handling children with a fever. Younger mothers can easily access a wider range of information through electronic media, which is now growing rapidly. At a young age, someone will easily follow any technological developments including health information, which in the present decade is easy to access through various media outlets.

Mothers who do not work handle children with a fever better. This is because the mother does not work and thus she has a lot of time to care for her child. The mother can use her full time to care for her child. When working, the mother’s time available to care for children is reduced because some of the time is used for work. In line with the results of Felfe Christina’s research, Amy Hsin., 2012 that when mothers work to care for their sick children less than mothers who do not work.

The older the child, the better the mother handles the fever. The child’s immune system will also develop as they age, in which case the children will not easily experience pain, especially the pain manifested by the symptoms of a fever.

The age of young people will make it more likely for parents to seek treatment from the health services. Parents who have children who are still young certainly have fears or anxieties when their children are sick. This anxiety can be due to the fear that unwanted things can happen and the fear that the child will experience seizures. It may also be due to them being an only child.

The sex of the boys makes the mothers better at handling children. Boys are highly expected in the family because they are the next generation. Boys often get more attention from their parents.

The position of having more than one child makes the mother better at handling children with fever. The mother will have experience of caring for a child before.

The advice given by the health workers has a good influence on how children are treated with fever. In handling sick children, the family is the first responsible for caring for the child. Handling a fever requires a partnership between the health workers and families (Notvitgon, 2010). One of the health workers’ tasks is to be educators, namely to provide information about health problems, especially on ways to treat fever whose sources can be trusted. Health workers can be met at the health center in the form of basic health services or at independent practices that have a role in providing health promotion/education to the community.

Other people’s experience about fever can also influence the way that the mother treats her children. A person’s experience of nervousness and success in managing fever can be copied by the mothers. Notoatmodjo (2007) stated that a person health behavior is determined by one of them being a reference.

The experience of success will be a good experience to imitate. Examples of failure/unsuccesfullness in a person will be a good lesson. Failures are not to be used as an example but to avoid so as not to experience the same failure with someone else.

The mother’s knowledge has a very good influence on the handling of children with fever. A good mother’s knowledge will mean that the mothers know how to handle a fever well. Good knowledge will affect someone when it comes to taking action. Knowledge is the main factor involved in someone taking action. The higher the knowledge level, the better someone will take action. The knowledge of the mother about fever will be a guideline for the mother in handling the fever. This was in line with the results of the research by Riandita (2012). This is about the level of knowledge of the mothers about fever and the management of fever in their children. In the line with Handanu (2017), the level of knowledge of the mothers about fever affected the management of fever in their children.

Based on Table 2, the advice from the health personnel, knowledge, the frequency of illness and the experiences of others influenced the handling of the mothers with children with fever. The information came from the most influential health officer.
Conclusion

Conclusion: The factors of knowledge, the frequency of illness and the experiences of their family/other people affected the mother when handling a fever. Advice from the health workers was the most influential on the mothers. Age, gender and the child's position did not affect the mother when handling the fever.

Suggestions:

1. For the health workers, increasing their role in health promotion aims to increase their maternal knowledge when handling sick children.

2. For the mothers, increasing their knowledge about handling sick children can be done through various media channels.

Ethical Clearance: Ethical approval for this study was granted by the The Health Research Ethics Committee High School Science Pemkab Jombang in 2019, Number 0418060514/STIKES-PEMKAB/JBG/VI/2019.

Source of Funding: None

Conflicts of Interest: None

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4. Profil Dinas Kesehatan Kabupaten Jombang 2018


Correlation Self-Efficacy and Nurse Motivation in the Implementation of Nursing Care in a Private Hospital

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ABSTRACT
The implementation standard of nursing care, according to the MOH RI (2005), is 75% of the average implementation of nursing care component. However, the implementation of nursing care as the provision of services at the hospital has not been optimal. This study aims to analyze the relationship between self-efficacy and nurse motivation as related to the implementation of nursing care. A correlational cross-section approach was used. This research was conducted at one of private hospital in Sepanjang. Thirty nurses who served as Team Leader Nurses participated. Purposive sampling was conducted. A Self-development Questionnaire was used to collect the data. The Spearman rank (rho) statistics test was used to analyze the data. The results showed there was a correlation between self efficacy and the implementation of nursing care (p = 0.00 <0.05 ; r= 0.997). There was a relation between nurse motivation and nursing care implementation where the value of the Spearman rank statistical test was (p = 0.000 <0.05 ; r = 0.964). Increasing the self-efficacy and motivation of nurses is very important in supporting the performance of the nurses, especially when implementing nursing care.

Keywords: self efficacy, nurse motivation, implementation of nursing care.

Introduction
Nursing services are a part of the health services in hospitals that support the healing process and the health recovery of patients who are treated. The quality of nursing services will reflect the quality of the service that is provided to the patients. The implementation of health services is carried out in a responsible, quality manner touching all levels of society without exception. Studies that have identified the provision of services in the hospitals referring to the implementation of nursing care have not been optimal, starting from the assessment stage through to the evaluation. However, in reality, up until now there are still many complaints and criticisms from the public regarding the services provided by nurses. This proves that the nursing care services are not optimal. If the provision of nursing care is still not in accordance with the standards of nursing care, then many clients will feel dissatisfied with the services provided because they do not meet the needs, expectations or desires of the patients receiving the health services.

The implementation of quality nursing care is needed. The standard of implementation of nursing care, according to the Ministry of Health of the Republic of Indonesia (2005), is 75% of the average implementation of the nursing care component. The results of Wahida et al’s study (2007) showed that the level of nurse involvement in the implementation of nursing care at the H. Damanhuri Barabai Regional General Hospital was good by 37.5%, quite at 25% and less at 37.5%. This shows that the implementation of comprehensive nursing care has not been carried out optimally. Nurlaila et al. (2013) also reported that the data from Labuang Baji Makassar General Hospital in 2010 showed that the overall standard of nursing care was 61.65%, which was carried out in the internal, surgical, midwifery and perinatal disease departments. The results of Mundakir’s (2016) study at Siti Khadijah Sepanjang Hospital show that the process of bio-psycho-socio-spiritual nursing care by the nurses was made up of assessments (46.7%), nursing diagnoses (26.7%), interventions (23%, 3%), implementation (23.3%) and documentation (3%).

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Facing such conditions, hospital nurses need to understand and realize that the services provided to the patients must be carried out professionally with a sense of responsibility and accountability. Performance can be influenced by several factors, including individual factors, psychological factors and organizational factors. Individual factors include ability, expertise, background and demography. Psychological factors include self-efficacy, attitude, personality, learning and motivation. Organizational factors include resources, leadership, structural rewards and job design. Self efficacy has an influence on overcoming pressures in the workplace.

In the research of Sri Rahayuningsih (2004), the independent variable of self efficacy had a positive and significant effect on performance. Nurses who have self efficacy have the feeling of being able to do work, better abilities, so the self efficacy variable can be explained by the feeling of being able to do work, better abilities, happy job challenges and satisfaction with their work. Besides self efficacy, which has an influence on performance, motivation also has an influence. The results of the study conducted obtained that there is a relationship between motivation on the nursing performance (p-value: 0.004).

Based on the above problems, to find out the causes of the successful implementation of nursing care, it is necessary to carry out more in-depth observations of all nursing care implementation processes ranging from assessment through to evaluation in order to obtain information on the quality services provided to the community. According to Manajemen dan kepemimpinan dalam keperawatan, there are several forms of staff development that can be carried out, including in-service education, orientation, job training, continuing nursing education, leadership training, career development, comparative studies, performance assessment, education and training, internships in more advanced hospitals, nursing work groups and the development of teamwork in the room. To be able to improve the self-efficacy and motivation of the nurses in the implementation of nursing care, there is a need for job security, an appropriate salary, benefits and fostering good relations with the supervisors, colleagues and subordinates. This is done to create optimal nursing staff performance. The final goal is to provide quality services to the customers. By describing the problem above, the researchers are interested in conducting research in order to analyze the relationship between the self-efficacy and motivation of nurses within the context of the implementation of nursing care.

**Method**

The research design used was cross-sectional, which is a type of research that emphasizes the time of the measurement/observation of both the independent and dependent variable data one at a time. The research was conducted for 3 days at one of the private hospital on the 19th, 20th and 21st July 2017. The sample in the study consisted of 30 nurses who were team leader. The method of sampling in this study was total sampling.

The instrument used in this study was a Nurse Motivation Questionnaire adopted from the Nurses Motivation Questionnaire developed by Nursalam. For the stage of knowing the details of the implementation of nursing care, in addition to using questionnaires, observations and interviews were conducted to obtain more accurate data. The data was analyzed using the Spearman rank statistical test (rho) with α below 0.05.

**Results**

The majority of the respondents were women (87%) who were 39 - 41 years olds (33%) who had been working for 20 - 21 years. Their education background was that of a Nursing Diploma (97%).

**Table 1: Characteristics of the Respondents**

<table>
<thead>
<tr>
<th>Characteristics of the Respondents</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
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</tr>
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<tr>
<td><strong>Ages</strong></td>
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<td>30-32</td>
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<tr>
<td>39-41</td>
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<tr>
<td>42-44</td>
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</tr>
<tr>
<td><strong>Length of Working</strong></td>
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<td>14-15</td>
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<td>16-17</td>
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</tr>
<tr>
<td>18-19</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>20-21</td>
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<td>30</td>
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<tr>
<td><strong>Education Background</strong></td>
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<td></td>
</tr>
<tr>
<td>S1 Keperawatan</td>
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<tr>
<td>DIII Keperawatan</td>
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<td>97</td>
</tr>
</tbody>
</table>
Table 2: Relationship between Self-efficacy and the Implementation of Nursing Care

<table>
<thead>
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<th>Self-Efficacy</th>
<th>Implementation of Nursing Care</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Good</td>
<td>Moderate</td>
</tr>
<tr>
<td>Good</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Moderate</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Spearman Rank Test* $\rho = 0.000 < \alpha = 0.05$ contingency coefficient $= 0.971$

Table 3: Relationship between Motivation and the Implementation of Nursing Care

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Implementation of Nursing Care</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Moderate</td>
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<tr>
<td>Good</td>
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<tr>
<td>Moderate</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Spearman Rank Test* $\rho = 0.000 < \alpha = 0.05$ contingency coefficient $= 0.990$

Based on the analysis of the data using the Spearman Rank (Rho) statistical test, the value of $\alpha = 0.000$ was obtained. This value is less than $\alpha (0.05)$. It can thus be concluded that $H_0$ is rejected, which means that there is a relationship between self-efficacy and the implementation of nursing care.

**Discussion**

The self-efficacy of the nurses at one of the private hospitals in Sepanjang showed that 17% of respondents had good criteria and that 73% of respondents had sufficient criteria. This is caused by the self-confidence to overcome problems, to carry out their intentions and goals, being calm when facing difficulties and the belief that there is always a solution for every problem. This belief can be derived from age and work experience. The respondents in this study had an average age of over 30 years old with an average work experience of more than 12 years. The respondents who had high self-efficacy were in the age range of 39 - 41 years. This is because the number of respondents in the age range of 39 - 41 years old was more than the other age ranges. The respondents who were over 39 years old also had a long working experience of more than 16 years, so the ability to overcome problems was not difficult for them. As many as 10% of respondents with fewer criteria was because the respondents did not always have many ideas in the context of dealing with the difficulties that exist.

The respondents who had less self-efficacy were the respondents who were younger than 34 years old with less than 16 years work experience.

Based on the results and theories presented above, it can be explained that the self-efficacy of the nurses was quite good for those aged above 39 years old who had been working for more than 16 years. This is due to their self-confidence and ability to overcome problems. Age and experience have thus been proven to have an influence on the decision making ability.

The motivation of the nurses and the related results showed that 20% of respondents obtained good criteria and that 57% of respondents had enough criteria. This is caused by the level of supervision from the leaders, the provision of education and training and satisfying working conditions. As many as 23% of respondents had lower criteria, caused by them not being satisfied with the salary earned and the close teamwork.

The above results illustrate that the motivation of the nurses plays a pretty good role relating to salary acquisition, supervision from their leadership, education and training and comfortable working conditions. Many of the nurses were motivated to work better.

The implementation of nursing care resulted in 7% of the respondents having a good criteria and 70% of respondents as having a sufficient criteria. This can be...
caused by strong abilities and motivation. Besides that, it could also be due to the supervision function carried out by the head of the room. Only 23% of the respondents had a lower criteria. This is because the nurses were still not satisfied with the rewards received concerning their performance.\(^{13}\)

Based on the results and concepts described, it can be said that there is a relationship between self-efficacy and the implementation of nursing care. The higher the self-efficacy that is owned by someone, the better that the person will be able to do their work and overcome all problems easily. Moreover, the respondents who were more than 39 years old and who had a longer working experience of more than 16 years tended to have high self-efficacy values. High self-efficacy values will affect a person’s ability to make decisions when facing problems. To remain calm when facing problems, it is important to know that there is always a solution for each problem and that should be goal-oriented.\(^{14}\)

In the meantime, based on the results, it has been shown that there is a relationship between the nurses’ motivation and the implementation of nursing care at one of the private hospitals in Sepanjang. The greater the motivation possessed by someone, the more that the person will work well because of the encouragement or reasons behind it.\(^{15}\) The encouragement of the nurses in one of the private hospitals in Sepanjang was through the supervision carried out by the head of the room, through their training and education and through the comfortable working environment. As evidenced from the results, the implementation of nursing care carried out by the nurses was categorized as quite well.

**Conclusion**

Increasing the self-efficacy and motivation of nurses is very important in terms of supporting the performance of the nurses, especially when implementing nursing care.

**Acknowledgments**

We would like to thank the respondents who participated in this study. Many thanks go to the Head of the Hospital and every nurse who welcomed us during the data collection.

**Ethical Clearance:** Ethical approval for this study was granted by the IRB committee of the Siti Khodijah Sepanjang Hospital in 2017.

**Source of Funding:** This study received funding support from the faculty of Health Sciences in the University of Muhammadiyah Surabaya, number 314.2/II.3.AU/F/ FIK/2017. The funding source was not involved in the study design, data collection, analysis or interpretation, nor in the writing of this report or the decision to submit the article for publication.

**Conflict of Interest:** None

**REFERENCES**


Medication Adherence and Quality of Life among People Living with HIV/AIDS (PLWHA) Who Joined and Did Not Join a Peer Support Group

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1Faculty of Nursing, Universitas Airlangga, Indonesia

ABSTRACT

ARV medication adherence and the quality of life in PLWHA are still low and most PLWHA have not joined a peer support group. This study aims to provide a comparative study of medication adherence and quality of life among people with HIV/AIDS (PLWHA) who joined and did not join a peer support group. The data of 39 PLWHA were collected from hospital in Madura, Indonesia. The independent variables measured include PLWHA who joined and did not join a peer support group, and the dependent variables included adherence to taking ARV drugs and quality of life for PLWHA. The medication adherence level and quality of life PLWA who joined a peer support group were better than who didn’t. Further studies are recommended to understand expected about other factors such as differences in medication adherence and quality of life in PLWHA with Drug Drinking Companions (PMO) or with family support.

Keywords: PLWH, Quality of Life, Medication adherence, Peer support group

Introduction

The number of people living with HIV who stopped ARV therapy increased from 23.25% in 2016 to 24.39% in 2017. Factors that cause PLHIV to stop ARV therapy are their own desire and failure of follow-up by health workers.1 The impact of stopping ARV therapy can increase the number of viruses, so that viral load will increase and CD4 cell count decrease. Therefore, there is a possibility of opportunistic infection. If PLWHA have ever received ARV therapy then stop it, CD4 decline becomes faster than PLWHA who have never received ARV therapy.2

The number of PLWHAs who don’t continue ARV therapy leads the death rate of PLWHA to increase. Treatment and self-care of PLWHA can be affected by psychological problems that have an impact on the quality of life.3 Psychological problems experienced by PLWHA are more severe, but the treatment is still more focused on social problems, such as stigma.4

According to WHO and UNAIDS estimates until the end of 2016, 36.7 million people were living with HIV, 1.8 million people had just been infected with HIV and the number of people who died of HIV reached 1 million people. PLWHA who received ART in mid-2016 were more than 18 million people (WHO, 2017). Based on reports of HIV-AIDS in Indonesia, the number of people living with HIV who had started ARV therapy increased to 158,224 PLWHA, but only 50.46% of PLWHA were still continuing ARV therapy.5

Some of the factors that are the main obstacles to non-adherence with ARV therapy a stigma, ARV side effects and forgetfulness, and facilitators that also influence include caregiver support, peer support groups and knowledge about HIV. Irregularity in taking medication or a bad adherence in ARV therapy can cause treatment failure.5

Social support is needed to increase PLWHA’s life expectancy. In addition, emotional support from families, health workers, and other fellow PLWHA is also needed.6 Their social support needs may increase. Five focus groups were conducted in Washington, DC with 23 HIV-positive African American women aged 52-65 to explore women’s perceptions about how
aging and HIV chronicity affects their social support needs. Participants were recruited from the longitudinal Women’s Interagency HIV Study (WIHS).

Seeing the phenomena and supported by existing data and based on Green’s theory of health behaviors where there are peer motivating factors that are badly needed by PLWHA, the researchers wanted to compare the level of adherence to taking Antiretroviral (ARV) drugs and the quality of life of PLWHA who joined and did not join the PSG. Therefore, this research will be very useful to increase the level of adherence to taking antiretroviral drugs and the quality of life of PLWHA.

Method

Study Design, Setting, and Sampling: The research design used is quantitative research with comparative descriptive methods. The population used in the study was all PLWHA who were receiving ARV therapy at the VCT Polyclinic at RSUD Dr. H. Slamet Martodirdjo Pamekasan. Samples were obtained using total sampling technique with the following inclusion criteria: 1) PLWHA who were more than 20 years old, and 2) PLWHA who can read and write, while the exclusion criteria set by the researchers are 1) PLWHA who have mental disorders, and 2) PLWHA with decreased awareness. The number of samples in this study were 39 respondents, consisting of 23 PLWHA who participated in the Malatèh Setaman peer support group and 16 PLHIV who did not join the PSG. The data collection process was carried out from June to July 2018.

Study Variables: Data for the independent variables are PLWHA who joined a peer group and those who did not, while the data dependent variable was obtained from filling out a questionnaire about adherence to taking ARV drugs using MMAS-8 and the quality of PLHIV using the WHOQOL-HIV BREF.

Data Analysis: Descriptive statistics method was employed to analyze the demographic data to generate the study results. The difference of quality of life and medication from the two groups were analyzed using Mann-Whitney U Test with a significance level α≤0.05.

Result

Demographics characteristics data of these 39 respondents describe the types of respondents in VCT Polyclinic Dr. H. Slamet Martodirdjo Pamekasan, which includes age, gender, last education, employment, income, marital status, and number of children.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Join in PSG</th>
<th>Not in a PSG</th>
</tr>
</thead>
<tbody>
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<td><strong>Age</strong></td>
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<tr>
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<tr>
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<tr>
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<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>10</td>
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<tr>
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<tr>
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</tr>
<tr>
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<tr>
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<td>9</td>
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</tr>
<tr>
<td>&lt; Rp 1,000,000</td>
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</tr>
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<td>1</td>
<td>6</td>
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<td>2</td>
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<td>By self</td>
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</tr>
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<tr>
<td>6-10 years</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1: Demographic characteristics of respondents
The majority of PLWHA who joined PSG mostly had high levels of adherence to taking ARV drugs, that is 11 respondents (28.2%), while PLWHA who did not join PSG mostly had low levels of ARV adherence, that is only 10 respondents (25.6%).

Table 2: Differences in the level of adherence to taking ARV drugs and quality of life

<table>
<thead>
<tr>
<th>Classification</th>
<th>Joined in PSG</th>
<th>Not in a PSG</th>
<th>Σ</th>
<th>%</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td></td>
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<td>Medication Adherence</td>
<td></td>
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<td>15.4</td>
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<td>11</td>
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<td>Low</td>
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<td>41</td>
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<td>5.1</td>
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<tr>
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<td>7</td>
<td>17.9</td>
<td>12</td>
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<td>0</td>
<td>2</td>
<td>5.1</td>
<td>2</td>
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</tbody>
</table>

Discussion

Most respondents often forget to take medication on time, feel disturbed because they have to take medication every day and often feel the side effects from drugs taken. The results of this study are in line with the research of Ammon et al. (2018) which shows that the main obstacle of non-adherence to ARV treatment is the side effects of ARV drugs, forgetfulness and lack of support from other parties, such as peer support.5

PLWHA who did not join KDS had stopped taking medication when their condition worsened. When they feel healthy, PLWHA think they do not need the medicine anymore. Basically, to undergo ARV therapy, the support of various parties is greatly needed, including the health professional team, family and peer support teams, so that when things happen that can make PLWHA want to stop taking ARV drugs, they motivate them to continue taking medication according to dosage.7

For PLWHA who still cannot accept the condition of their illness, peer support groups and case managers are supporting factors because, generally, PLWHA who join peer support groups get a lot of knowledge from the group and have the opportunity to share knowledge and remind each other, including in terms of taking medicine.8

Accidentally not taking medicine is often carried out by PLWHA who do not join PSG. Feeling bored and desperate about their illness is the reason for PLWHA to do this. Even though they routinely take medicine every month, they do not always drink all of the medicines. The motivating factor in improving the health behavior of PLWHA in adherence to taking ARV drugs can be obtained from peers with PLWHA and people who care about HIV.9 So, if the role of peers here operates properly, then PLWHA may not do things that harm themselves, like deliberately not taking the medicine.

The low information that mothers have of HIV and the lack of sufficient support from peer support groups to comply with taking antiretroviral drugs causes low compliance with taking ARV drugs.10 Social support is recognized as important in treatment because it always provides support to PLWHA so that they do not feel ashamed to bring their medication while doing activities with their friends.11

The results of this study were also supported by the results of Xu’s research, which found that social and emotional support and counselling from peer groups were strong compliance factors.12 Judging from the existing peer support groups, such as regular meetings, studying together, supervision of taking medication and capacity building for PSG, members can improve the obedience of PLWHA in taking ARV drugs because, besides getting knowledge, PLWHA can also understand the importance of taking the drugs.

Having to take medicine every day is uncomfortable because there will be demands and they will feel burdened. So, often there will be a feeling of boredom
with the routine. When this boredom arises, the role of the closest people who can strengthen PLWHA is needed. Motivation, support and even just the presence of others will be very meaningful. Therefore, the presence of peers in the PLWHA’s lives will greatly influence each of them to motivate fellow PLWHAs to continue taking ARV drugs.

Most of the respondents who joined peer support groups received more support from their environment because the health of PLWHA and the environment in which PLWHAs live also directly affected the quality of life of PLWHA. The results of this study are in line with the research of Novrianda et al., which showed that PLWHA must feel safe while in their neighborhood, so that there will be an increase in quality of life by the way the families receive PLWHA, as in do not avoid, do not reject and do not isolate them. In addition to the family environment, the external environment can also be influential because humans are social beings who need other people in their lives.

Financial resources are also an important factor in the environmental domain. Research conducted by Hultman and Hemlin in 2006 showed that respondents who do not have a job have worse quality of life than those who do. Likewise, the lack of economic needs and insufficient influences greatly on the quality of life. Misunderstanding in the community about HIV makes people tend to isolate PLWHA, so that they make PLWHA increasingly withdrawn from social life.

The majority of the two comparison groups both have enough energy in carrying out their daily activities and are satisfied with their sleep, but also many PLWHA who do not join PSG have less energy in carrying out activities. The results of this study are in accordance with Carter’s (2012) study (cited in Novrianda et al.,2015) who suggested that peer support influences the quality of life of PLWHA, such as energy/fatigue, sleep, cognitive function, physical activity, and their daily activities.

The majority of the two comparison groups alike rarely have negative feelings, such as loneliness, despair, anxiety and depression. The psychological problems experienced by PLWHA are actually more severe, but the treatments that have existed so far are still more focused on social problems, such as stigma.

Most PLWHA who did not join the PSG were not satisfied with their ability/capacity to work, while PLWHA who joined the PSG were very satisfied with their ability/capacity to work. This result is in line with the research by Van Tam who found that improved quality of life was related to the level of freedom of PLWHA. Most people living with HIV/AIDS who do not join a peer support group feel very afraid of the future and are very worried about death, while PLWHA who join a peer support group are not. Increased quality of life is related to the spiritual level, such as perceptions about the future and worrying about death. Higher spiritual needs are found in PLWHA with stage IV HIV.

This research results related to this quality of life are supported by Sesaria’s research which showed that the role of peer support groups is very good for the quality of life of PLWHA.

Quality of life is an important factor and needs to be considered, especially for the mental health of PLWHA, and can contribute to the happiness and self-satisfaction of PLWHA and provide benefits to the family and community. Activities commonly carried out by peer support groups, such as meetings, studying together, peer assistance, supervision of taking medication, Community Counseling, Information and Education and fundraising, can also be done to improve the quality of life of PLWHA directly.

Conclusions

PLWHA who joined a peer support group had a higher level of adherence to taking antiretroviral (ARV) drugs and better quality of life than PLWHA who did not join. It is recommended for VCT Polyclinic Nurse of Dr. H Slamet Martodirdjo Pamekasan hospital to involve PLWHA who have joined a PSG to meet and invite new PLWHA or who have not joined to do so. For Malatèh Setaman peer support groups, it is recommended to make online discussion at least twice a week, especially inviting PLWHA who have not joined a PSG to join in the online discussion. Further research is expected about other factors, such as differences in medication adherence and quality of life in PLWHA with Drug Drinking Companions (PMO) or with family support.

Ethical Clearance: The research was approved by the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga, in 2018.
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13. Hultman B, Hemlin S. Self-rated Quality of Life Among the Young Unemployed and the Young in Work in Northern Sweden. 2006;


The Influence of Bibliocare on Depression Level of Cancer Client with Chemotherapy

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1Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Cancer clients undergoing chemotherapy require stimulation from cognitive aspects to turn negative perceptions into positive ones. Utilization of a book as a media therapy is called bibliocare. This study is aimed to analyze the effect of bibliocare to change depression level in cancer client with chemotherapy. This study was Quasi-Experiment, population in chemotherapy center of Dr. Mohammad Hoesin Hospital, Palembang, sample size 36 patient, taken by simple random sampling. The independent variable was the implementation of bibliocare. The dependent variable was depression level. Data were taken by using Hamilton Depression Rating Scale (HDRS) questionnaire then analyzed by Wilcoxon Signed Rank Test and Mann-Whitney U test. The result showed a significant effect of bibliocare implementation on depression in the treatment group with Mann-Whitney U test, p=0.000. Sixteen respondents experienced a decrease in the level of depression, two people remained the same and no one experienced an increase in depression. It showed a significant difference between pretest and posttest bibliocare implementation. It could be concluded that the implementation of bibliocare could change depression level in cancer client with chemotherapy.

Keywords: Bibliocare, Depression, Cancer, Chemotherapy

Introduction

Chemotherapy in cancer affects physical and psychological problems. Physical problems due to chemotherapy are manifested with hair loss, body weakness, blackened skin and other effects. Psychological problems include worry, anxiety, and depression. Depression in cancer clients is contributed from various aspects. The client feels fear of pain, having a short life, losing independence, and feeling helpless. Some aspects that adequately affected the client’s emotional condition were therapeutic side effects, length of treatment, repetitive treatment, high cost, and lack of communication and information from the medical team. Medical treatment for cancer can affect the body’s metabolic system, which affects the psychological aspects.

Cases of cancer clients have increased from 1.4 million people to 12.7 million people. The World Health Organization (WHO) stated that there are always new cases related to cancer and, currently, there are 28 types of cancer in 184 countries around the world. According to Basic Health Research in 2013, the prevalence of cancer clients in all age populations in Indonesia was 1.4%. The highest prevalence of cancer was found in D.I Yogyakarta province, with 2.4%, while East Java is 0.5%. Cancer client data at Central General Hospital (RSUP) Dr. Mohammad Hoesin Palembang in 2015 showed there were 2,838 patients, and increased up to 5,758 patients in 2016.

According to research in 2016, cancer clients experience psychological distress, anxiety and depression as much as 45%. Cancer clients that undergo some chemotherapy often have anxiety. This anxiety is influenced by internal factors (adaptability) and external (physical threat and self-esteem), as explained in Roy’s nursing theory about adaptation. The process before the onset of depression starts from the feeling of a threat then the clients will continue to think about their condition, which can lead to stress phase and eventually
raises anxiety (input). This process leads to an angry reaction both to themselves and to others (the process). This self-indignation is what often leads to maladaptive conditions causing depression (output).  

Some studies have stated that book-reading therapy can reduce stress and anxiety levels in cancer clients. Utilization of a book as a media therapy is called bibliocare. Bibliocare is a therapeutic activity of treatment using a book followed by a discussion according to the topic of life problems at that time. Bibliocare can be used in people with depression problems, who are asked to read self-help and motivational books to speed up the healing process. Bibliocare helps the clients to process painful personal experiences by normalizing feelings and enhancing coping support through stories. Based on the above exposure, this study aims to determine the influence of bibliocare on decreased levels of depression in cancer clients who underwent chemotherapy at the Central General Hospital (RSUP) Dr. Mohammad Hoesin Palembang.

**Method**

This research was Quasi-Experiment using pre-/posttest control group design. The sample was 36 cancer client respondents, selected by simple random sampling. Independent variable is bibliocare, dependent variable is depression. The data were analyzed by Wilcoxon Signed Rank Test and Mann-Whitney Test, with significance level p ≤0.05. This study has obtained the approval of ethical clearance from the field of education and research Hospital Dr. Mohammad Hoesin Palembang, number TU.05.01/11/9516/2016.

**Result**

Demographic descriptions stated more than half of respondents were from women’s treatment and control groups, most of whom only went to senior high school/senior high school, the majority were 31-50 years old and almost all treatment and control group respondents were married. Many respondents worked as entrepreneurs, the majority of respondents were Muslim, many respondents had chemotherapy series 3, more than half of the respondents’ treatment and control group.

**Effect of Bibliocare toward Depression Levels:**

Wilcoxon Signed Rank Test results showed that there was a difference of depression level in the treatment group before and after bibliocare, p = 0.000, while, in the control group, there was not found any changes in depression level, p=0.399 (Table 1).

<table>
<thead>
<tr>
<th>Depression Criteria</th>
<th>Treatment Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>%</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Depression</td>
<td>18</td>
<td>100</td>
</tr>
<tr>
<td>Amount</td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

Wilcoxon Signed Rank Test 0.000 0.399

Negative Rank 16 6
Positive Rank 0 3
Ties Rank 2 9

Mann -Whitney U Test 0.000

The treatment group obtained 16 respondents who experienced decreased depression level (negative ranks); none experienced an increase in depression and two respondents had the same value between before and after bibliocare. In the control group, six respondents experienced decreased depression level, three respondents increased and nine respondents had the same value between before and after the intervention. Mann-Whitney test results showed that there was a difference of depression level between treatment group and control group after giving intervention.

**Discussion**

The rate of depression before being given bibliocare in the treatment group and the control group was
100%, meaning that, of 36 respondents, all experienced depression. The majority of respondents considered the diagnosis of cancer as an incurable disease diagnosis and ended with death, but they did not lose their life expectancy; only a small percentage (22.2%) felt that they had no life expectancy since diagnosis of the disease. The majority of respondents aged 31-50 years amounted to 80.6%. Factors causing depression are age, lifestyle, environmental, and biological factors. Risk factors for the occurrence of depression in cancer patients include negative thoughts about cancer, stage of cancer and treatment measures undertaken. The cause of depression is the presence of cognitive factors, in which a person with low cognitive distortion will cause depression. One’s mechanism is influenced by the cognator aspect. Occupation and educational level greatly affect the occurrence of depression.

More than half of respondents, or 55.5%, were female with married percentage 91.7%. Other causes of depression are psychosocial factors, which include life events and environmental stress, that affect a person’s mood. Biological factors, such as gender also affect a person’s depression level. Regarding biological factors, the disease process in a woman can lead to hormonal changes, resulting in emotional symptoms such as anger and depression. One of the factors causing depression is a psychosocial factor in the form of environmental stress. Undergoing long chemotherapy is one of the adaptations of a person to a contextual stimulus. In respondents undergoing chemotherapy series until the sixth (6th) series, it takes a long time to affect the emotional level during the session because it takes a long time to reach the end of the chemotherapy session. Chemotherapy makes the majority of cancer clients experience worry, fear of death, and pain during therapy.

This phenomenon shows that, knowing the diagnosis of disease, the severity of the disease and the prognosis of cancer is an aspect that affects one’s emotional level. Taking chemotherapy treatment also affects a person’s psychological aspects. Before giving bibliocare, there are many things that cause cancer clients who undergo chemotherapy to experience depression. Chemotherapy as one of the main choices of treatment for cancer and has side effects that can cause anxiety, stress, and depression.

The rate of depression after being given bibliocare in the treatment group was 61.1% to normal. Almost all respondents still felt sad knowing the diagnosis of the disease, but some respondents experienced a better change. Respondents also still felt scared about the side effects that will be felt due to undergoing chemotherapy, but some respondents also changed to a better direction. The majority of respondents after being given bibliocare already considered that the diagnosis of cancer was a diagnosis of a curable disease and most of the respondents did not lose their life expectancy (91.7%). Respondents stated that the books provided had similar stories to their circumstances, this being the motivation for respondents to do the same. Most of the respondents liked to read, and a small proportion didn’t. Bibliocare or reading therapy can solve one’s personal problems.

The respondents of the treatment group and the control group underwent a third chemotherapy treatment with the percentage of 30.6%. The majority still felt bored undergoing chemotherapy treatment because they had to undergo chemotherapy to reach the sixth session, and one session can take 15 days depending on the condition of the respondent. The findings are consistent with other studies that stated chemotherapy makes most cancer clients fearful, afraid of death, and feel pain during therapy.

This phenomenon shows that undergoing chemotherapy treatment also affects a person’s psychological aspects. The findings are consistent with other research that stated chemotherapy is one of the most important treatment options for cancer and has side effects that can cause anxiety, stress, and depression. Having an interest in reading also affects emotional level. Research states that reading allows a person to express their feelings so they can lower the anxiety levels that can lead to depression.

The result of statistical test of comparison of pre-post-depression rate of bibliocare in the treatment group showed that there was a change of depression level, meaning there was influence of bibliocare on depression level in the treatment group. The results of this study are in accordance with other studies that found bibliocare is useful to express yourself, your thoughts and feelings. Bibliocare is also applied as a way to solve problems that can significantly lower the level of depression. Respondents in the treatment group experienced a change in depression rates for the better (normal) based on the Hamilton Depression Rating Scale (HDRS) questionnaire. In the posttest results in the posttest group of bibliocare giving, the change of
the respondents’ perceptions became positive as they revealed that the stories were similar to their story and respondents who experienced a change in depression levels. This happened because not all control group respondents were given bibliocare. This phenomenon is possible because the patient may have experienced additional stressors during chemotherapy treatment. Based on the data, it also showed nine respondents having the same value or who did not experience changes in depression levels before and after the HDRS questionnaire given to the control group. This happened because not all control group respondents were given bibliocare.

After reading the bibliocare book, the majority of respondents who experienced a change in depression revealed that the stories were similar to their story and the respondents’ perceptions became positive as they realized that many people had experienced a worse case than theirs. Therefore, respondents were able to rise and did not feel sad again.

In the second question, some respondents felt no hope of life after being diagnosed with cancer, but some of them didn’t feel the same way. The respondents who were young and newly diagnosed with cancer still believed they could be cured. Respondents’ coping mechanisms were disrupted due to stressors they experienced after being diagnosed with cancer. The process of decreasing the life expectancy of the respondents was influenced by the catharsis stage. At this stage, the respondents were asked to read the words of motivation listed in the book repeatedly. This affected their psychological and cognitive aspects. A person’s adaptation of the stimulus received will affect their coping mechanism. Coping mechanisms that are affected in this case were the effectors, as they relate to self-concept and self-function. Stimulus given in the form of words of motivation provides a spirit of life for respondents who felt they had a short life expectancy.

In the third, fourth, fifth, and tenth questions, many respondents felt sad at having to undergo chemotherapy, feared the side effects, and felt bored undergoing the long series of the therapy. The process of decreasing the respondents’ sadness was influenced by the deep insight stage of bibliocare. At this stage, the respondents and researchers discussed together the contents of the reading that had been given. The contents of these readings talked about the success of other cancer patients who underwent chemotherapy. The purpose of this stage is to encourage respondents in undergoing chemotherapy. This also affects the psychological aspects of respondents. Respondents who adapt to chemotherapy affect their self-concept of mood disorders (sad, hopeless, helpless). Adaptation will affect the concept of themselves and the role of someone else. This is the mechanism of effector and cognator. The external stimulus a person receives is a stimulatory stimulus.

### Conclusion

This study showed that there was a change in depression levels before and after being given bibliocare in the treatment group. Depression rates between the treatment group and the control group experienced a difference. Sixteen respondents experienced a decrease in the level of depression after being given the bibliocare among the cancer clients undergoing chemotherapy.
Ethical Clearance: This study obtained the approval of ethical clearance from the field of education and research Hospital Dr. Mohammad Hoesin Palembang, number TU.05.01/11/9516/2016.

Source of Funding: Self

Conflict of Interest: None

REFERENCES


Parental Self-Efficacy on Temper Tantrum Frequency in Children

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ABSTRACT

Although typical in children between the ages of 18 months and 4 years, temper tantrums can be predictive of maladaptive outcomes, particularly if they continue into later ages. Parental self-efficacy (PSE) has emerged as a powerful mediator of children temperament and a predictor of specific positive parenting practices. This study aimed to determine the correlation between PSE and temper tantrum frequency in children aged 2-5 years. This study was a correlational research. Ninety-six parents of children aged 2-5 years participated in this study. The Self-efficacy for Parenting Task Index-Toddler Scale and Multidimensional Assessment of Preschool Behaviour Problem were used to assess the study variables. The data was analysed using Spearman’s rank correlation test. The statistical test results showed a significant correlation between parental self-efficacy and temper tantrum frequency (p-value = 0.000; r = -0.669). The majority of respondents had a moderate level of PSE, and most of the children had low temper tantrum frequency that was mostly expressed with screaming, stamping feet and holding breath. It can be concluded that there was a correlation between PSE and temper tantrum frequency in children aged 2-5 years in a negative direction, which means the higher the PSE, the lower the temper tantrum frequency.

Keywords: Temper Tantrum, Self Efficacy, Children Health

Introduction

Temper tantrums are the most common behavioural problems in children from 16 months to 6 years in the form of explosive anger indicated by behavioural variations ranging from crying and shouting, to rough and aggressive actions such as throwing things, rolling on the floor, banging the head and kicking or hitting the parent or guardian. Temper tantrums are common in pre-school children, but it is abnormal if it occurs every day. Abnormal temper tantrums are manifested by tantrums that occur daily or not daily but with prolonged duration of more than 5 minutes with aggressive behaviour. Abnormal temper tantrums contribute many negative effects onto children. The short-term effects may include children’s anger by hurting themselves and others or destroying objects around them, as well as uncontrolled emotions and aggressiveness. In the long term, the children could not deal with their surroundings, could not adapt to a new environment and found difficulties in solving a problem. Children who suffer temper tantrums with abnormal frequency are also associated with delinquency in their teenage years.

A study in Finland found that 87% of 132 parents reported that their child had experienced temper tantrums. The average tantrum begins between the ages of 2 and 3 and stops before the age of 5 years. The duration of tantrums in 46.5% of children ranged from 5 to 10 minutes. Temper tantrums are experienced once a week in 37.3% of children and once a month in 30.7% of children. A study conducted in Indonesia shows that high-frequency temper tantrums in pre-school children reached 26% of 88 respondents. A study of Syam added that 34.2% of the 38 parents reported could not control the tantrums of their children.

Parents are often unaware that they can allow the occurrence of the tantrum in their children. Parents with low parental self-efficacy (PSE) are usually unsure of their own abilities as parents so that when the child...
throws a tantrum, they cannot show a proper response.\textsuperscript{12} The parents often give in to the wishes of the children, provoked by the show of emotions or could not show persistence in parenting.\textsuperscript{1} Parents who always follow the request of their children will lead to the occurrence of tantrum behaviour when the request is rejected. The children with strict protection and domination by their parents will also react against their parent’s wish by acting out a tantrum behaviour.\textsuperscript{10}

Parents with high levels of PSE will display positive parenting behaviours by building a healthy and fun nurturing environment.\textsuperscript{13} The high self-efficacy level makes the mother fully involved in performing her role as a parent.\textsuperscript{14} Parents with a high PSE level also have higher interest, commitment, and persistence in facing challenges during the parenting activities.\textsuperscript{15} This makes the parents consider difficult child behaviour as a challenge that requires more effort and creative ways to overcome the behaviour.\textsuperscript{12,16}

Parental behaviour in nurturing and educating children is one of the main predictors of a temper tantrum in children besides environmental factors and characteristics of the children.\textsuperscript{17} PSE is the main determinant that will influence the strategy chosen by parents in facing a temper tantrum which then influences the behaviour of the tantrum.\textsuperscript{18} Parents with high PSE will be more responsive to all the needs of children during tantrums, so parents can deal with and prevent tantrums well. The level of PSE also affects the parenting style chosen by parents. Parents with a democratic parenting style tend to have children with normal temper tantrums and parents who apply an authoritarian parenting style tend to have children with abnormal tantrums.\textsuperscript{10}

However, there is no previous study of the PSE regarding the frequency of temper tantrum. Therefore, the purpose of this study was to identify the correlation between PSE and the temper tantrum frequency in children aged 2-5 years.

**Method**

This study used a cross-sectional approach. The study involved 96 parents of students of three preschool programs of Mawar, Melati 3 and Flamboyan in Mulyorejo District, Surabaya, Indonesia. The data were collected using Self-efficacy for Parenting Task Index-Toddler Scale (SEPTI-TS) questionnaire to measure the PSE level and the Multidimensional Assessment of Preschool Behaviour Problem (MAP-DB) questionnaire to measure the children’s temper tantrums.

SEPTI-TS has 53 questions divided in seven subscales encompassing emotional availability, nurturance/valuing/empathetic responsiveness, protection, discipline/limit setting, play, teaching and instrumental care/structure/routines. The scoring system was a 6 point Likert scale where a score of 1 meant very disagree and 6 meant very agree.\textsuperscript{19}

MAP-DB was a questionnaire with 22 questions. The questionnaire was developed with 14 items which captures behavioural expressions, interactional context and triggering events, plus 8 items of anger regulations. The scoring system used a 6-point Likert scale where score 0 meant never and 5 meant many times each day.\textsuperscript{20} The data was analysed using Spearman’s rank correlation test with $\alpha \leq 0.05$.

**Results**

Table 1 shows the demographic data of the respondents. All respondents were female and the majority aged between 26-30 years (40.6%). The respondents were mostly high school graduates (55.2%). The majority were housewives (69.8%). Forty-two respondents (43.8%) had 2 children, 33.3% had only 1 child, and 22.9% had more than 2 children.

Based on Table 2, 62.5% of the children were female, and 37.5% were male. Half of those (50%) was 3 years old, and 49% of those were the first children.

Table 3 shows cross-tabulation between two variables. The parents with high PSE level were 14 respondents (14.6%) with 12 of those having children with low category temper tantrums and 2 respondents having children with temper tantrums in moderate category. In addition, 82 parents (85.4%) had moderate PSE level where 44 of those had children with low temper tantrums, meanwhile the other 38 had children with moderate tantrums.

Spearman’s rho test result on PSE with temper tantrums in children aged 2-5 years obtained degree of significance $(p) = 0.000$, which means there is a correlation between parental self-efficacy with the frequency of tantrums in children aged 2-5 years. The value of correlation coefficient $(r)$ of -0.669 shows a
fairly strong level of relationship between two variables. The correlation coefficient is negative, which means there is an inverse correlation between the two variables. So it can be inferred that the higher the parental self-efficacy means the temper tantrums experienced by the children will be lower.

Table 1: Demographic distribution of the respondents (n = 96)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-25 years</td>
<td>18</td>
<td>18.8</td>
</tr>
<tr>
<td>26-30 years</td>
<td>39</td>
<td>40.6</td>
</tr>
<tr>
<td>31-35 years</td>
<td>21</td>
<td>21.9</td>
</tr>
<tr>
<td>36-40 years</td>
<td>18</td>
<td>18.8</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
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<tr>
<td>Junior High School</td>
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<td>31.3</td>
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<tr>
<td>Senior High School</td>
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<td>55.2</td>
</tr>
<tr>
<td>College</td>
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<td>3.1</td>
</tr>
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</table>

Table 2: Children characteristics of the respondents (n = 96)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>37.5</td>
</tr>
<tr>
<td>Female</td>
<td>60</td>
<td>62.5</td>
</tr>
<tr>
<td>Age</td>
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<td></td>
</tr>
<tr>
<td>2 years old</td>
<td>11</td>
<td>11.5</td>
</tr>
<tr>
<td>3 years old</td>
<td>48</td>
<td>50.0</td>
</tr>
<tr>
<td>4 years old</td>
<td>37</td>
<td>38.5</td>
</tr>
<tr>
<td>Order in family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st child</td>
<td>47</td>
<td>49%</td>
</tr>
<tr>
<td>2nd child</td>
<td>29</td>
<td>30.2</td>
</tr>
<tr>
<td>3rd child</td>
<td>17</td>
<td>17.7</td>
</tr>
<tr>
<td>4th child</td>
<td>3</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Table 3: Correlation between parental self-efficacy and temper tantrums frequency (n = 96)

<table>
<thead>
<tr>
<th>Temper Tantrums Frequency</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental Self-efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>2.1%</td>
<td>12</td>
<td>12.5%</td>
<td>14</td>
<td>14.6%</td>
</tr>
<tr>
<td>Moderate</td>
<td>38</td>
<td>39.6%</td>
<td>44</td>
<td>45.8%</td>
<td>82</td>
<td>85.4%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>41.7%</td>
<td>56</td>
<td>58.3%</td>
<td>96</td>
<td>100%</td>
</tr>
</tbody>
</table>

Spearman’s rho coefficient = -0.669 p = 0.000

Discussion

All respondents were mothers of the children. A study revealed that mothers have higher self-efficacy than fathers.21 In addition, most of the respondents reached senior high school education. The level of education is important as it affects the health literacy of the parents. The parents with lower health literacy will also have lower PSE.22 The mothers self-efficacy also can be raised by providing proper education for the mothers.23 Most of the respondents work as housewives. Career women tend to have limited time to interact with their children and this affects their ability to always accompany their child as well as their self-efficacy.24

The findings are in accordance with a study which mentioned that there is a significant relationship between the level of PSE with the child’s developmental status and behaviour, where the higher the level of PSE will lead to the better the status of development and behaviours shown by the child.16,19 Also, maternal self-efficacy had a negative correlation with dysregulation in child behavior.25 Other studies have also identified PSE as a factor mediating components that affect parenting qualities such as maternal depression, child temperament and social support.26–28

The subscale of discipline in children is closely related to the parenting pattern that parents follow in
dealing with their children, one of which influences authoritarian attitudes and disciplines. In authoritarian parenting, parents have a tendency to take care of the children according to what is best regarded by them, such as with punishment and indifference. This attitude can cause tension and discomfort that allows the occurrence of chaos in the house. It is supported by a study which mentions that parenting patterns are related to the incidence of temper tantrums. Parents with authoritarian parenting have children with uncontrolled temper tantrums more than parents with democratic parenting.

**Conclusion**

The study concludes that the PSE level for most parents is in the medium category. The frequency of temper tantrums of most children is in a low category. There is a strong correlation between the PSE and temper tantrum frequency in a negative direction, which means the inverse correlation between the two variables.

Preschool programs are expected to establish and run a parenting class program to increase parenting knowledge and abilities on parenting to enhance the PSE. In addition, the preschool programs are also recommended to increase the quantity of character building programs that shape the characteristics of children to prevent temper tantrums.

**Ethical Clearance:** This study has passed ethical clearance from the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga, Indonesia, with number 467-KEPK.

**Source of Funding:** Self-funded.

**Conflict of Interest:** None.

**REFERENCES**


Motivation Affects Self-Efficacy Greater than Age, Sex, and Education in Diabetic Patients in West Coast Area of Java Island

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ABSTRACT

Self-efficacy and motivation are required for patients with type 2 diabetes in managing their diabetes. This study used observational analytic design with a cross-sectional approach. Samples recruited were 115 respondents selected by using purposive sampling method. The data analysis used logistic regression with significance level of α < 0.05. This study results showed that motivation more affects patient’s self-efficacy (p < 0.001) after being controlled by age, sex, and education. Conclusion of this study was that the highest patient motivation is influenced by the patient’s desire to recover from his illness and support from the family. The recommendation of this study is how to develop self-efficacy and motivation to establish the adherence of diabetic patients to carry out their self-care management.

Keywords: characteristics, motivation, self-efficacy, diabetes mellitus

Introduction

Diabetes mellitus (DM) is a chronic disease that requires adherence in carrying out self-care in order to achieve glycemic control and slow the emergence of complications.¹ Patient adherence to do self-care management for current DM is not yet entirely good and optimal. Adherence of DM patients is influenced by internal factors (individual characteristics, knowledge, self-awareness, and motivation) and external factors such as physician’s ability and health system support.² The results showed that motivation, self-efficacy, perception, treatment process, and degree of illness can inhibit the implementation of self-care in addition to individual factors such as age and gender.²-⁴ These barriers can affect adherence of DM patients running self-care, causing poor glycemic control, increasing the risk of hypertension, occurrence of complications, and maintenance costs.⁴

DM patients are expected to increase globally by 204 million, from 425 million in 2017 to 629 million in 2045 or an increase of around 48%.³ Indonesia ranks 6th out of ten countries with the highest number of patients diagnosed globally with DM, namely 10 million. The highest number of patients diagnosed with DM was at the age of 20-64 years, amounting to 327 million people compared to ages 65-99 years at 123 million people.⁵

Adherence to self-care management among DM patients requires the confidence of the patient that he can deal with and undergo treatment after being diagnosed. The results of the current research showed that one of the causes of the failure of DM patients to carry out self-care management is lack of motivation. This motivation is the driver of the patient’s self-awareness because of the belief in healing the illness.³⁶⁷ Other factors related to adherence to the implementation of DM self-care are patient characteristics, such as age, gender, occupation, education, and also local culture.³⁴⁸⁻¹²

The previous research showed, among other factors, that intrinsic motivation and self-efficacy are often found to be major factors in influencing patients to manage their diabetes.³⁹⁻¹⁴ Motivation makes someone have a strong desire to make efforts so that the goal is achieved.
Motivation can affect self-efficacy.\textsuperscript{2,15} Self-efficacy of diabetes patients refers to an individual’s belief in one’s competence in successfully performing a given action on diabetes management. Higher self-efficacy is associated with more prudent self-care behaviors and better glycemic control, indicating that individuals who perceive themselves more confident in managing their disease are also more likely to do so.\textsuperscript{1,8,15}

The aim of this study was to determine the self-efficacy determinants of the characteristics and motivation of patients with type 2 diabetes mellitus.

Method

Study Design, Setting, and Sampling: The study design used observational analytic with cross-sectional design which was held from May to September 2018. The population in this study was diabetes mellitus outpatients. The sampling technique used a nonprobability sampling with purposive sampling approach as many as 115 subjects.

Study Variables: The questionnaires for motivation measurement were validated and the reliability tested with Cronbach’s alpha value of 0.92. Motivational instruments were adopted from previous studies and validity and reliability were tested by researchers, consisting of 13 closed-ended questions.

The self-efficacy questionnaire used the Diabetes Management Self-Efficacy Scale (DMSES) in which the language had been modified; the validity and the reliability were tested with Cronbach’s alpha 0.919, consisting of 16 questions.

The process of data collection was carried out in an outpatient room. Patients who met the inclusion criteria and were willing to be involved as research subjects were determined as respondents. Respondents involved were given instruments in a certain room so that the confidentiality of the data was guaranteed.

Data Analysis: The data were analyzed using SPSS software version 16. The data analysis was performed by using Chi square in bivariate and logistic regression for multivariate analysis. The research results are displayed in the form of percentages, p values and OR values

Results

The results of the analysis in Table 1, show occupation variable has P value 0.442, so that it is excluded from the model. However, sex and education variables remain included in the model because previous studies show that age and education are related to self-efficacy.

Table 1: Bivariate selection of independent variables and self-efficacy n = 115

<table>
<thead>
<tr>
<th>Variables</th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.007</td>
<td>2.121</td>
</tr>
<tr>
<td>Sex</td>
<td>0.198</td>
<td>1.754</td>
</tr>
<tr>
<td>Education</td>
<td>0.018</td>
<td>0.610</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.442</td>
<td>1.173</td>
</tr>
<tr>
<td>Motivation</td>
<td>0.001</td>
<td>4.239</td>
</tr>
</tbody>
</table>

Table 2 shows the results of the first multivariate analysis of the four dependent variables; the education variable has the highest p value. Table 3 shows that, after occupation variable is excluded, there is no change in OR value > 10% in other variables. So the occupation is put back into the model. Then, because the education variable has P value greater than 0.005, it is excluded from the model.

Table 2: First modeling logistic regression  N = 155

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>P Value</th>
<th>OR</th>
<th>95% CI (lower-upper)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.747</td>
<td>0.081</td>
<td>2.111</td>
<td>0.912 – 4.882</td>
</tr>
<tr>
<td>Sex</td>
<td>0.573</td>
<td>0.272</td>
<td>1.774</td>
<td>0.638 – 4.928</td>
</tr>
<tr>
<td>Education</td>
<td>-0.492</td>
<td>0.311</td>
<td>0.611</td>
<td>0.236 – 1.582</td>
</tr>
<tr>
<td>Motivation</td>
<td>1.462</td>
<td>0.001</td>
<td>4.312</td>
<td>1.838 – 10.120</td>
</tr>
</tbody>
</table>

Table 3: Changes in OR values before and after occupation variable is excluded  n = 155

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR gold standard</th>
<th>OR without occupation variable</th>
<th>The OR Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>2.121</td>
<td>2.111</td>
<td>5 %</td>
</tr>
<tr>
<td>Sex</td>
<td>1.754</td>
<td>1.774</td>
<td>1,1 %</td>
</tr>
<tr>
<td>Education</td>
<td>0.610</td>
<td>0.611</td>
<td>0,2 %</td>
</tr>
<tr>
<td>Occupation</td>
<td>1.173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>4.239</td>
<td>4.312</td>
<td>1,7 %</td>
</tr>
</tbody>
</table>
Table 4 shows the results of the second multivariate analysis of the three dependent variables; the sex variable has the highest p value.

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>P Value</th>
<th>OR</th>
<th>95% CI (lower-upper)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.847</td>
<td>0.041</td>
<td>2.334</td>
<td>1.034 – 5.268</td>
</tr>
<tr>
<td>Sex</td>
<td>0.824</td>
<td>0.071</td>
<td>2.280</td>
<td>0.931 – 5.584</td>
</tr>
<tr>
<td>Motivation</td>
<td>1.498</td>
<td>0.001</td>
<td>4.473</td>
<td>1.915 – 10.449</td>
</tr>
</tbody>
</table>

Table 5 shows that, after the age variable is excluded, it is found that the education and motivation variables have OR> 10%, so the age variable is put back into the model. Then, the final analysis is carried out after the age variable is re-entered (Table 10).

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR gold standard</th>
<th>OR without occupation variable</th>
<th>The OR Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>2.121</td>
<td>2.015</td>
<td>5 %</td>
</tr>
<tr>
<td>Sex</td>
<td>1.754</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.610</td>
<td>0.471</td>
<td>23 %</td>
</tr>
<tr>
<td>Motivation</td>
<td>4.239</td>
<td>3.908</td>
<td>7.8 %</td>
</tr>
</tbody>
</table>

Table 6: Logistic regression modeling results

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>P value</th>
<th>OR</th>
<th>95% CI (lower-upper)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.747</td>
<td>0.081</td>
<td>2.111</td>
<td>0.912 – 4.882</td>
</tr>
<tr>
<td>Sex</td>
<td>0.573</td>
<td>0.272</td>
<td>1.774</td>
<td>0.638 – 4.928</td>
</tr>
<tr>
<td>Education</td>
<td>-0.492</td>
<td>0.311</td>
<td>0.611</td>
<td>0.236 – 1.582</td>
</tr>
<tr>
<td>Motivation</td>
<td>1.462</td>
<td>0.001</td>
<td>4.312</td>
<td>1.838 – 10.120</td>
</tr>
</tbody>
</table>

The final results of multivariate analysis are shown in Table 6. It shows a significant correlation between motivation and self-efficacy, while the variables of age, education, and gender become the control variables. The results of the analysis showed that the Odd Ratio (OR) of the motivation variable was 4.3 (95% CI: 1,838 - 10,120), meaning that patients with high diabetes motivation would increase their chances of showing positive self-efficacy by four times compared to those with low motivation after being controlled by age, gender, and education.

Discussion

The results of this study indicated that motivation plays an important role in the self-efficacy of diabetic patients to carry out self-care. Motivation provides a more meaningful correlation than age, sex, and education. This study revealed that internal motivation is important in shaping the beliefs and confidence in carrying out self-care. Patients with strong motivation have strong fighting strength, so that they are not burdened to undergo diabetes management and this can affect patient self-efficacy.15 Self-efficacy is part of the most important mechanism of human self-reflection and is one part of human agents. Human beliefs about self-efficacy affect the form of the action that they will choose to do, what effort they will give to this activity, how long as they will survive in the face of obstacles and failures, as well as their toughness following a setback.15 Self-efficacy has a very strong quality influence in human actions. Self-efficacy combines with the environment, previous behavior, and other personal variables, especially expectations, for results to produce behavior. People who believe that
they can do something that has the potential to be able to change events in their environment will be more likely to act and be successful than people who have low self-efficacy.\textsuperscript{1,15}

The results of this study were supported by several previous studies. Internal motivation and self-efficacy play the biggest role in diabetes management. Therapy, advice from a professional health worker, or existing health facility is not sufficiently helpful if the patient does not have the desire within himself to be willing to comply with the recommended treatment.\textsuperscript{2,3,9} Motivation constraints that are commonly encountered and based on the results of previous research are the boredom of adherence on diet, continuity in exercising, and fear of complications due to prolonged medication.\textsuperscript{2,6,8,9} The concept and assumption of a diet, for example, is a factor that is often found as an obstacle to the implementation of diabetes diet management when there is no motivation to run it.\textsuperscript{1,9,12}

Motivation can also affect other diabetes self-care adherence, such as medication failure. Recent study found that 50% of medication failure was caused by physician factors, 30% of patient factors, and 20% healthcare-related factors.\textsuperscript{17} Patient factors that contribute to the failure of treatment for diabetes are denial of the disease, denial of the seriousness of the disease, low health literacy, high cost of medication, too many medications, side effects of the medication, poor communication between physician and patient, lack of trust in physician, depression, lifestyle and absence of symptoms.\textsuperscript{17,18}

Motivation is not the only factor that influences self-efficacy. Patient characteristics can also affect the efficacy of his treatment of the disease and the care that must be taken.\textsuperscript{13,19,20} The study also showed that patients over 56 years had more positive self-efficacy than those under the age of 56. The reason obtained from in-depth interviews was that they were more receptive to their illness than those aged less than 56 years. Especially for elderly patients (over 60 years), they lived their lives and diseases by surrendering to God and had no difficulty in carrying out therapy according to the advice of a doctor or nurse, while younger patients said it was more difficult to accept the disease and didn’t expect to have diabetes therapy and management every day of their lives.\textsuperscript{3,8,13} Psychologically, acceptance of the disease and surrender to the ultimate God helped the patients sincerely set the therapeutic program.\textsuperscript{1,7,21}

The limitation of this study is not analyzing external factors that can affect self-efficacy, such as family factors or health workers. Limitations in sampling also became one of the weaknesses in this study. Samples should be taken randomly so that the results are better and cover a wider area.

**Conclusion**

The findings revealed that motivation had a great potential to achieve the self-efficacy needed to achieve glycemic compliance and control. The characteristics of age, education, and gender were confounding factors that can affect self-efficacy, but can be overcome if the internal factors, such as motivation, are more positive. The findings can explain why motivation and self-efficacy are very important for adequate glycemic control. This research can be developed to find internal self-efficacy factors, including internal motivation, to achieve self-care adherence and glycemic control.

**Ethical Clearance:** The study protocol was approved by The Faculty of Nursing Science of Universitas Islam Agung Semarang Indonesia.

**Source of Funding:** This research was supported and funded by the institution of Faletehan Serang Banten Institute of Health through the Institute for Research and Community Service.

**Conflict of Interest:** None

**REFERENCES**


The Correlation of Duration of Hormonal Contraception with the Case of Breast Cancer at RSUD Jombang

Sestu Retno Dwi Andayani¹, Rizki Aprillia², Mamik Ratnawati³
¹Lecturer, ²Student, Nursing Study Program, Stikes Pemkab Jombang, Jombang, Indonesia

ABSTRACT

Breast cancer is the most deadly case for women. One of the causes is duration of hormonal contraception use. The purpose is to determine correlation of duration hormonal contraception use with breast cancer cases. Study design used analytic correlation with a cross-sectional method. The population is all users of hormonal contraception at RSUD Jombang (396 people). The sample size used purposive sampling technique with 364 respondents. Independent variable is duration of hormonal contraception use and dependent variable is breast cancer cases. Furthermore, analysis test used chi-square with α = 0.05. The result indicated that 60 (48.1%) from 125 respondents using hormonal contraception >5 years had got breast cancer. However, all of 239 respondents (65.8%) using hormonal contraception <5 years did not get breast cancer. The result of chi-square is p = 0.000 <0.005, which means strong correlation of duration hormonal contraception use with breast cancer cases. The conclusion is hormonal contraceptive use >5 years will increase the risk of breast cancer cases.

Keywords: hormonal contraception, breast cancer.

Introduction

Breast cancer is a type of cancer which often occurs in women in Indonesia. The risk factors for breast cancer are, age > 50 years, alcohol consumption, obesity, giving birth at the age of more than 35 years, never giving birth, not breastfeeding, menopause at age > 50 years, early menarche, radiation exposure, and the long term use of hormonal contraception.¹ The hormone is exposure to sex hormones such as estrogen and progesterone in which excessive amount interferes with physiological processes in the body, including mammary tissue.²

Based on the Hospital Information System (SIRS) in 2014, the number of outpatients and inpatients (12.8%) had breast cancer as many as 12,014 people (28.7%) and cervical cancer with total 5,349 people.³ Breast cancer had a contribution of 30% and is the most dominant in Indonesia, outstripping cervical cancer or cervical cancer which contributes 24%.⁴ The mortality rate from breast cancer is high in developed countries and it is still low in developing countries, including Indonesia.³ Based on early detection of breast cancer in Indonesia as of 2016, the number of breast cancer patients was 4,030 people with those surviving cervical cancer numbering 1,739 people.³ Based on breast cancer data in Jombang Hospital in 2017 there were 31 people with breast cancer.

Many factors can cause breast cancer, one of them is the use of hormonal contraception. It is a part of a program known as family planning which is an attempt to delay pregnancy or determine the number of or time between pregnancy using contraception.⁶ According to the World Health Organization (WHO), nearly 380 million couples used family planning and 65-75 million of them used hormonal contraception such as oral contraceptives, injections and implants.⁷ Data of the National Population and Family Planning Board showed that the choice of contraception was the most interested or chosen by new and active family planning users, namely pills and injections.¹ Data from the national population and family planning body (BKKBN) in 2013 received 8,500,247 couples of reproductive age who
were new family planning participants, with details of injectable contraceptive use 4,128,115 participants (48.56%), pills as many as 2,261,480 participants (260%), implants were 784,215 participants (9.23%), condoms were 517,638 participants (6.09), intrauterine contraception 658,632 participants (7.75%), MOW (female surgery method) 128,793 participants (1.52%), MOP (male surgery method) 21,37 participants (0.25%). From the above data, we can see that the most widely used is hormonal contraceptive methods. In addition, data from the health profile of Jombang district, showed that the type of contraception used by acceptors is injection KB, as much as 61.9%, followed by pills and implants. Previous studies had shown that there was a correlation between the use of hormonal contraception and the incidence of breast cancer.

Some studies suggest that the use of hormonal contraception over a long period of time or ≥5 years can increase breast cancer risk. Women who use hormonal birth control have a risk of 2,990 times more likelihood of getting breast cancer. Other studies suggest that hormonal contraceptive use causes increased exposure to estrogen and progesterone hormones which can cause cell proliferation in the breast glands and inhibition of the apoptotic process. This, hormonal contrast was one of the risk factors for breast cancer.

Prevention efforts were a healthy lifestyle, counseling, and also early detection with the BSE system (check your own breasts) to see whether there were lumps or other changes that were a sign of breast cancer and required medical attention. Based on the above background, the researchers are interested in conducting research related to the use of hormonal contraception with the occurrence of breast cancer in Jombang General Hospital.

Method

Study Design, Setting, and Sampling: The design of this study was cross-sectional analytic. Population was all hormonal contraceptive participants who used injections, pills and implants in the Jombang Hospital, as many as 396 people. The sample size, as many as 364, used purposive sampling technique. The independent variable was duration of hormonal contraceptive use and the dependent variable was breast cancer cases. The place and time of the study were the Jombang District Hospital, 9-15 May, 2018.

The study used observations and used the chi-square statistical test

Results

Long usage of hormonal contraception

Table 1: Frequency distribution of respondents based on duration of hormonal contraceptive use at the Jombang Hospital Polyclinic, 19-30 May, 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>The duration of family planning</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>&gt; 5 years</td>
<td>125</td>
<td>34.2</td>
</tr>
<tr>
<td>2.</td>
<td>&lt; 5 years</td>
<td>239</td>
<td>65.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>364</td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: 2018 primary data

Table 1 shows that the majority of respondents (65.8%) used <5 years hormonal contraception, as many as 27 respondents.

Table 2: Characteristics of respondents based on the incidence of breast cancer

<table>
<thead>
<tr>
<th>No.</th>
<th>Incidence of breast cancer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
<td>60</td>
<td>16.5</td>
</tr>
<tr>
<td>2.</td>
<td>No</td>
<td>304</td>
<td>83.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>364</td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: 2018 primary data

Table 2 shows that almost all respondents (83.5%) did not have breast cancer, as many as 364 respondents.

Correlation between the duration of hormonal contraceptive use and the incidence of breast cancer

Table 3: Cross-tabulation of the correlation between the duration of hormonal contraceptive use and the incidence of breast cancer in the Gynecology Department of Jombang Hospital on 19-30 May, 2018

<table>
<thead>
<tr>
<th>Hormonal Usage</th>
<th>Breast cancer history</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>%</td>
</tr>
<tr>
<td>&gt; 5 Years</td>
<td>60</td>
<td>48.1</td>
</tr>
<tr>
<td>&lt; 5 Years</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: primary data 2018
Based on Table 3, 12 of the 52 respondents who used <5 years of Hormonal KB all 100% had no breast cancer.

**Discussion**

**Long usage of hormonal contraception:** Table 1 shows that most (65.8%) of the older respondents use hormonal contraception <5 years, as many as 27 people. Previous theory mentioned that nearly 70% of acceptors used hormonal contraception methods. The duration of use of hormonal contraception depended on the type of contraception which was used every day for many years, but there were also many side effects complained about by family planning acceptors because they use hormonal contraception methods.

According to researchers, some respondents used hormonal contraception <5 years because the contraception which was chosen was inappropriate or unsuitable, so they replaced it with other hormonal contraceptives for a period of <5 years.

Based on the results of the study, it was shown that almost all (77.2%) of the respondents obtained information, as many as 66 people. The delivery of information or messages about family planning programs can use radio, TV, and promotion with the aim of problem solving within the community to improve or achieve family planning programs. Information on the selection of appropriate contraception types and good time periods can be obtained by consulting a doctor or health worker.

According to the researchers, the information obtained by respondents about KB programs and hormonal contraceptives was obtained from many various sources. Before starting a plan to use hormonal contraception, the acceptor candidates will be given information on the types of side effects and how to overcome them.

Based on the results of the study, it showed that the majority (53.2%) of respondents used injectable contraception type, as many as 42 people. This can be due to the benefits of using hormonal contraception, which can be used by breastfeeding mothers, do not need to be consumed every day or used before sexual intercourse, and help to overcome cramps during menstruation and reduce menstrual blood.

According to injectable contraceptive research, many respondents used these methods because most considered them suitable and effective as they did not require lengthy usage and were not as difficult as other contraception. The use was only 1-3 times a month, whereas contraception pills must be routinely taken every day and the user must understand how to take medication and people who do not know and use other contraceptives, might feel sick and be afraid of the risks of breast cancer incidence.

**Breast cancer incidence:** Table 2 shows that for almost all respondents, the incidence of breast cancer did not occur, as many as 304 people (83.5%). This supports previous research into causes of breast cancer not only from hormonal contraception, but also age, genetics, pregnancy, radiation, diet and being overweight.

According to research, the occurrence of breast cancer because of hormonal birth control alone cannot be generalized as a cause of breast cancer as breast cancer itself occurs due to factors such as age, occupation, offspring, and not having children as well as hormonal factors. One of the hormonal factors can be obtained by using a long-term hormonal birth control because of the frequent exposure to estrogen and progesterone, which can trigger the growth of breast cancer cells.

According to research, respondents aged >35 years were more susceptible to breast cancer because at that age a person experiences a decrease in the immune system, so that they are easily exposed to diseases, one of them being breast cancer. Especially if supported by factors that cause breast cancer.

Based on the results of the study, it showed that the majority of respondents were aged >35 years, as many as 50 people (63.3%). Women in their mid-30-40s were at risk of developing breast cancer at that age because this is the most common ages in which the first stages of breast cancer were detected.

According to research, respondents aged >35 years were more susceptible to breast cancer because at that age a person experiences a decrease in the immune system, so that they are easily exposed to diseases, one of them being breast cancer. Especially if supported by factors that cause breast cancer.

Based on the results of the study, it showed that the majority of respondents did not work, as many as 56 people (70.9). Women who work have a higher risk of breast cancer, especially in women who work at night, because the light at night can suppress the production of melatonin in the brain so that the hormone estrogen increases; melatonin is believed to increase breast cancer cell growth.
According to research, some jobs could be a risk factor for breast cancer, such as work that is directly exposed to chemicals, such as in factories. Women who were often exposed to light at night, such as watching the screen of a cellphone with high light intensity for a long time, could trigger the growth of breast cancer cells.

Based on the results of the study, it showed that all respondents did not experience a family history of cancer, as many as 79 people (100%). Women with offspring or who previously had a family member suffering from breast cancer had a high risk of developing breast cancer. About 5-10% of breast cancers were reduced, meaning the seeds of cancer were a direct result of gene abnormalities (gene mutations) that were lowered from their parents.3 those who have family members aged 65 years have twice the risk, and, among younger women with breast cancer, the more likely it is the disease is hereditary.15

According to the research no history of breast cancer in the family would reduce the risk of breast cancer. Breast cancer could also be avoided with a healthy lifestyle and not choosing jobs that trigger breast cancer. Women could also do an early check-up with a health service if there were one or two family members who had previously had breast cancer as this could help to prevent the spread of cancer and allow prevention as soon as possible.

Based on the results of the study, it showed that the majority of respondents did not experience a weight gain (43 people equal to 54.4%). Women who were overweight after entering menopause at the age of > 35 years had a higher risk of developing breast cancer.3 Women who are overweight have a higher level of estrogen than they should, because, before menopause, the ovaries and fat tissue both produce estrogen. After menopause, the ovaries stop producing estrogen so that estrogen comes from fat tissue. Having more fat tissue means increasing estrogen levels after menopause, thereby increasing the risk of breast cancer.

According to the research, there was no increase in body weight due to a match with the type of contraception used; those who used hormonal contraception were asked if they experienced weight gain or side effects.

The correlation duration of hormonal birth control with breast cancer: The results of the Contingency Coefficient statistical test obtained a significant number with a value of 0.524, which means there was a correlation between the two variables with medium strength and a positive direction.

Previous research stated that the risk factors affecting breast cancer incidence were the age of the respondent, age of menarche, age of menopause, length of breastfeeding, duration of oral contraceptive use, consumption patterns of fatty foods, fibrous food consumption patterns, obesity, dietary patterns, passive smoking and alcohol consumption.16 Women currently taking oral contraception had a one-fourth greater risk than women who have stopped using it 10 years ago, but the increase in risk is not statistically significant. This supports other studies which state that hormonal contraceptive use causes increased exposure to estrogen and progesterone hormones, which can cause cell proliferation in the breast glands and inhibition of the apoptotic process.11

According to the research, hormonal contraception used > 5 years could be trusted as the cause of breast cancer. The incidence of breast cancer itself was usually detected at the age of > 35 years, so that more women who had already been affected by the impact of breast cancer, with awareness for early examination would certainly be able to reduce the factors that cause breast cancer. The use of hormonal contraception could not be used as a reason for breast cancer. Hormones were not only obtained from contraception, but could be obtained from other drugs that contain the hormones estrogen and progesterone. The occurrence of breast cancer could be triggered from the use of hormonal contraception > 5 years and is supported by other factors, including unhealthy lifestyles, rarely exercise, working in places that were often exposed to chemicals, and tobacco. The results of the study showed that there was a correlation between the use of long-term hormonal birth control and the incidence of breast cancer, even though from 239 respondents and there were 364 respondents who used family planning < 5 years, which means they had a lower risk of breast cancer.

Conclusion

This study illustrates that there is a relationship between the duration of use of hormonal contraception and the incidence of breast cancer in Jombang Hospital with a probability value (0.000) and is supported by the results of contingency statistics with a value of 0.524,
which means there is a correlation between two variables with moderate strength and positive direction, where the duration hormonal contraceptive use is directly proportional to the minimum incidence of breast cancer. Further research is expected to develop nursing planning and increase knowledge and early detection of breast cancer.

**Ethical Clearance:** The ethical approval for this study was granted by The Health Research Ethics Committee High School Science Pemkab Jombang in 2018.

**Source of Funding:** None

**Conflict of Interest:** None

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Experiences of Recovery from Acute Coronary Syndrome: A Systematic Review

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ABSTRACT

Understanding how patients experience recovery from acute coronary syndrome is critical for improving continuity of care. Continuity of care from hospital to home can be particularly challenging. This review aims to provide an overview of patients’ experiences of recovery from ACS. Data sources used keyword search of Medline, CINAHL plus, Scopus, Science Direct and Proquest databases. The inclusion criteria were conducted with adult population, qualitative research and articles published in English language in 2008-2018. This review used Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) guidelines. The samples of 21 qualitative articles were included. Discharge planning and systematic follow-up shortly after discharge are increasingly viewed as being important. Patients need adequate instruction and information on how to integrate health information. Further research is needed to improve intervention strategy among people suffering from ACS, especially in developing countries.

Keywords: Acute coronary syndrome, experience, recovery

Introduction

Acute coronary syndrome (ACS), especially ST elevation myocardial infarction (STEMI) and non-ST elevation myocardial infarction (NSTEMI), can cause significant morbidity and mortality.¹ The risk of recurrence of heart disease is also still high after ACS, especially in the first year.² Stroke, or cardiovascular death after acute coronary syndrome. We investigated these aspects and developed tools for predicting these events according to the time of their occurrence. Methods: A retrospective study was conducted of 4858 patients who survived an acute coronary event. We analyzed the incidence and predictors of acute myocardial infarction, stroke, or cardiovascular death during the first year (n = 4858) The transition period of recovery is a complex process requiring input, timely exchange of information and coordination between various disciplines, both with patients and families.³ Healthcare professionals need to pay attention to patient perspectives through a carefully performed dialog formulated in a personal care plan for each patient with ACS.⁴ There is a need to better understand patients’ perceptions of their illness. Objective: To explore patients’ experiences of ACS during their hospital stay. Design: A qualitative interpretative interview study was conducted among patients during their hospitalization for ACS. Setting: The study was performed in two designated coronary care units at a hospital in Sweden. Participants: Twelve participants (five women and seven men; age range, 45-72 years

Experience in adjusting and adopting lifestyle changes after ACS is influenced by subjective experience in an individual, sociocultural and environmental context. Other factors that influence the adjustment of post-ACS patients are misunderstanding, misconception and confusion about the process and management of the disease. Post-ACS patients need continuous input and support from professional health personnel during the rehabilitation and recovery process.⁵ The purpose of this review is to provide an overview of patients’ experience of recovery after ACS.

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Method

Study Design, Setting, and Sampling: The researchers searched CINAHL plus, Medline, Scopus, Science Direct and Proquest databases for studies conducted with adult population, qualitative research and articles published in English language in 2008-2018. The keywords included recovery, rehabilitation, experience, acute coronary syndrome, and myocardial infarction. This review used Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) guidelines. Studies were included if they were original articles assessing the patients’ experience of recovery from ACS. The researchers excluded reviews that did not explore patient experiences, e.g. the experiences of family, carers, nurses, and partner following the spouse’s coronary attack.

Results

There were 252 papers found from five databases: 43 papers from Scopus, 15 from CINAHL plus, 46 from MEDLINE, Science Direct 8 papers and Proquest 140 papers. There were 189 papers which were excluded because of irrelevant studies. There were 21 papers that met the inclusion criteria after a review based on abstract and full text.

Twenty-one qualitative studies published during 2008-2018 were identified exploring the experience of recovery after ACS or MI. Six studies were conducted in Australia,\textsuperscript{6-11} five in Sweden,\textsuperscript{4,12-15} three in USA,\textsuperscript{16-18} two in Norway,\textsuperscript{19,20} two in Denmark,\textsuperscript{21-22} one in Ireland,\textsuperscript{23} and one in the United Kingdom.\textsuperscript{24} These studies involved a total of 438 participants post-ACS/MI including (270 women, 168 men), and seven mentors. Sample size was ranging from eight to 130.

Data collection used a variety of interview techniques with age ranging from 40-90 years. Various qualitative designs were used, including phenomenology, grounded theory, and case study. The majority of interviews were conducted at the participant’s home and in hospitals, which lasted between 20 and 120 minutes.
Discussion

Women’s views of their MI were complex and diverse. The basic psychosocial problems were: changing patterns of fear (fear of living with heart disease, fear of death and fear of recurrence), anxiety, and uncertainty.

The basic psychosocial process to resolve the conflict is living a new normal: uncertainty in seeking help (indecisiveness; self-treatment; emerging perception), rapid changing, evolving patterns (confronting mortality; avoidance; readjustment, reminiscing the past) and spiritual solace. Patients were motivated to change their lifestyle and contemplated taking their life in new directions, adopting a change of life perspective, finding a meaning in what had happened and managing consequences of MI. Individual perceptions of patients’ lifestyle and support, one year after an AMI, with or without mentorship, had similarities and tendencies to variation in their perceptions, with both a positive and negative view of life.

The lived experience of individuals in cardiac rehabilitation who have positive outlooks on their cardiac recovery includes choosing life over death, learning to live a new self, and a life-transforming cardiac event. Choosing life over death describes an increased awareness of mortality that leads individuals to make improvement in their health a priority. Learning to live a new self was used to describe participants’ experience of changing their lifestyle and the usage of facilitators to overcome barriers. All of the participants described cardiac rehabilitation as one of the important first steps toward successful cardiac recovery. Some participants described their cardiac event as a life-transforming experience, despite the negative effect of cardiac event on the participant’s life.

Both men and women have recovery experiences after ACS. The women’s recovery process is a multidirectional process with a desire to develop and approach a new perspective on life, including engaging in activities (behavioral dimension), appreciating social life (social dimension: how women receive and give support in their social environment) and psychological (their way of thinking, reflecting, and appreciating life), and mobilizing own resources. The experiences of midlife women who survive MI and return home to recover included freedom/un-freedom, knowing/not knowing. Not only the women, the men also have awareness that life is lived forwards and understood backwards. The myocardial infarction causes limitations in their lives even five years after the MI. The women experience physical restrictions, fatigue and also other health complaints. Furthermore, the older women suffer from various co-morbidities.

Conclusions

Transition to recovery is a phased psychological process and where people gradually accept the details of the new situation and the changes that come with it. Further studies are strongly recommended to research to improve intervention strategy among people post-ACS, especially in developing countries.

Ethical Clearance: N/A

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Conflict of Interest: None

REFERENCES


ABSTRACT

HIV/AIDS is a disease that weakens the immune system, causes opportunistic diseases, and increased morbidity and mortality. Since the beginning of its discovery, the HIV/AIDS epidemic now has spread and infected all countries. There are still many people living with HIV/AIDS (PLWHA) neglecting to prevent transmission of HIV infection. Prevention of HIV transmission is a serious challenge and it is important to reduce new infections. Not many people with HIV positive status are willing to tell their partners, and this has the potential to infect others. This cross-sectional study is aimed to identify the relationship between factors of knowledge and spirituality with the prevention behavior of HIV/AIDS transmission by PLWHA, and recruited 100 PLWHA in Jakarta. The results of bivariate analysis through the chi-square test concluded that there was no relationship between knowledge and the prevention behavior of HIV/AIDS transmission, and there was a significant relationship between spirituality and prevention behavior of HIV/AIDS transmission. Therefore, the spirituality aspect of PLWHA needs to be considered by the health team to behave positively in the prevention of HIV/AIDS transmission.

Keywords: Knowledge, Spirituality, Prevention Behavior of HIV/AIDS Transmission

Introduction

HIV/AIDS is a disease that weakens the immune system, creates vulnerability to opportunistic infections, and threatens morbidity, and is main cause of death.\textsuperscript{1,2} UNAIDS stated that no country in the world is free from HIV/AIDS.\textsuperscript{3}

The first HIV case was reported more than 35 years ago has since caused 36.7 million of the world’s population to live with HIV and more than 35 million die from AIDS.\textsuperscript{4} The Indonesian Ministry of Health in 2017 reported that, as of March 2017 the highest number of HIV infections was in Jakarta (46,758), followed by East Java (33,043), Papua (25,586), West Java (24,650), and Central Java (18,038), with a cumulative number of 242,699 cases. Whereas most AIDS was in East Java (17,014), Papua (13,398), Jakarta (8,769), Bali (6,824), Central Java (6,531), West Java (5,289), North Sumatra (3,897), South Sulawesi (2,812), Kalimantan West (2,597), and East Nusa Tenggara (1,959), with a national cumulative number of 87,453 cases.\textsuperscript{5}

According to the Pelita Ilmu Foundation report in 2017, there were 3064 PLHIV living with HIV at the foundation, of whom 2658 were still alive, and 406 had died. The foundation develops four types of programs, including prevention programs, health services, and support for people with HIV. Prevention programs consist of reproductive health education and AIDS in schools; guiding teenagers in the community; guiding street children and adolescents; prevention of mother-to-child transmission (PMTCT); reproductive health education and AIDS for children in prison; community-based drug prevention; counseling for prospective workers; and AIDS campaigns in public places. Whereas VCT programs and health services include HIV testing and counseling (VCT) services for risk management; adolescent health clinic services; family clinic services (general, women and children); and VCT and CST for prisoners.\textsuperscript{6}
Support programs for PLWHA are carried out with a variety of activities, including Ramadhan studies for PLWHA Muslims, and night contemplation is carried out regularly. In the evening, service events are held by experts, such as theater of love and education about the latest information about HIV/AIDS. “Memorial Temple” is one of the activities attended by PLWHA and their families. In the “Memorial Temple”, the ODHA family draws on a canvas about the daily activities or ordinary work done by PLWHA. All programs are dedicated to the vision of the foundation, namely to create a society that behaves healthily independently and with broad insight so that it can lead a productive and quality life.6

PLWHA can be at high risk of transmitting HIV, both consciously and unconsciously. An investigative report has proven that. From 1997-2009, an ODHA man in Texas carried out “attacks with deadly instruments in the form of body fluids” to 13 women he dated, so that all of them were tested positive for HIV. Five of the 13 women reported to the police and testified in court, until finally the man was found guilty of crimes and the Texas court sentenced him to 45 years in prison.7

Other factors also play a role, namely the negative environmental response, including ODHA families, can provoke anger among PLWHA and encourage deliberate transmission of the virus. In addition, it can reduce the desire of individuals to take HIV tests, have safe sex, access to health services, and to adhere to ARV therapy.

Efforts to deal with the endemic of HIV/AIDS through increasing public knowledge are carried out by many parties, including HIV/AIDS activists, governments, and non-governmental organizations, including the involvement of religious leaders and religious organizations. The CDC, on its website, informs about prevention of HIV infection with five strategies, including abstinence, limiting sexual partners, not sharing needles, using condoms properly, using HIV prevention drugs and post-exposure prophylaxis. The most important thing is to take antiretroviral drugs, because you can stay healthy and, if you have an HIV-negative sex partner, it can be effective without the risk of transmitting it.8

Millions of information about HIV/AIDS can be accessed through the Google search engine. By using HIV/AIDS keywords, there were 261,000,000 information content, with 139,000,000 HIV/AIDS prevention keywords, and with HIV/AIDS transmission, there were 23,700,000 information content.7,9 HIV/AIDS prevention efforts also involve the Faith Based Organization (FBO), both related to prevention, transmission and care in a socio-cultural perspective.

In-depth interviews and observations of phenomena in Central and Bali found that the involvement of religious institutions and leaders in the prevention of HIV/AIDS has strategic values, both directly and indirectly. These different regions have shown changes in discourse and practice regarding the issue of HIV/AIDS, both among religious leaders and the wider community.10 Involvement of spiritual values as a foundation of faith that will fortify oneself from behaviors that are at risk of contracting and transmitting HIV to and from other people around them.10 The involvement of religious institutions and figures is expected to instill spiritual values as a foundation of faith that will fortify themselves from behaviors at risk of transmitting HIV to others.

Indonesia is known as a country with the fastest increasing HIV/AIDS prevalence. New infections are still high, between 20,000-25,000 cases per year. This means that the threat of HIV/AIDS is still serious and requires continuous action.10

The high addition of new infections requires an approach, not necessarily from the view of the medical field, but also social and cultural. Realizing the importance of this, wherein religion and its characters are important elements that influence society, the government has since involved the Ministry of Religion to integrate the issue of HIV/AIDS.

Public education and the involvement of religious institutions and figures have broadened the HIV/AIDS intervention effort not only in order to increase knowledge about HIV/AIDS, but also to build the spiritual quality of PLWHA and the community as a bastion against risky behavior. However, the factors of knowledge and, especially, spirituality in relation to the prevention behavior of HIV transmission are more regarded as opinions than evidence. This research found new findings (evidence) that show a positive relationship between the two factors mentioned above to prevent HIV transmission among the PLWHA. Therefore, this study is intended to explore the relationship between the factors of knowledge and spirituality of HIV/AIDS transmission among PLWHA.
Method

Study Design, Setting, and Sampling: This descriptive correlation study involves about 2,658 HIV/AIDS population in the Pelita Ilmu Foundation at Jakarta. The total sample of 100 clients was obtained through purposive sampling with the criteria of respondents as PLWHA, aged over 18 years, able to write and read, in a conscious state, and willing to participate in research. Data collection was done using a questionnaire that has been tested for validity, and includes three main aspects, namely: 1) knowledge of HIV/AIDS transmission (Cronbach’s alpha: 0.368), 2) instruments of spirituality level of PLWHA (Cronbach’s alpha: 0.692), and 3) behavioral instruments to prevent HIV/AIDS transmission (Cronbach’s alpha: 0.606).

Data Analysis: Descriptive statistics method was employed to analyze the data. Univariate analysis is intended to determine the frequency and percentage of each variable, while bivariate analysis uses the chi-square test to test the differences between the two groups of categorical data in order to see the significance of their associations.

Result

1.1 Demographic data of respondents

Table 1: Frequency distribution of respondents based on the demographic characteristics of respondents (n = 100)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Categories</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20-30</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

The results of the univariate analysis in Table 1 above show that, based on age, the majority of PLWHA are the age group 31-40 years (47%), generally men (59%), with senior high school education (58%), married (66%), with a background in the employment of private employees (36%), and, based on religion, the majority are Muslim (94%).

1.2. Relations between variables

Table 2: Relationship between knowledge level and prevention behavior of HIV/AIDS transmission (n = 100)

<table>
<thead>
<tr>
<th>Level of knowledge</th>
<th>Prevention behavior of HIV/AIDS transmission</th>
<th>Total</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Well</td>
<td>67</td>
<td>93.1</td>
<td>5</td>
</tr>
<tr>
<td>Low</td>
<td>24</td>
<td>85.7</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>85.4</td>
<td>9</td>
</tr>
</tbody>
</table>

The results of the analysis of the relationship between the level of knowledge and the behavior of prevention of HIV/AIDS transmission found that there were as many as five (6.9%) PLWHA who had a good level of
knowledge, and behaved positively in the prevention of HIV/AIDS transmission, while, among PLWHA with moderate levels of knowledge, there were four (14.3%) PLWHA, who behaved positively in preventing HIV/AIDS transmission. The results of the statistical test obtained a value of \( p = 0.262 \), thus, it can be concluded that there is no relationship between the level of knowledge and the behavior of prevention of HIV/AIDS transmission.

### Table 3: Relationship between spirituality level and prevention behavior of HIV/AIDS transmission (\( n = 100 \))

<table>
<thead>
<tr>
<th>Level of spirituality</th>
<th>Prevention behavior of HIV/AIDS transmission</th>
<th>Total</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative</td>
<td>Positive</td>
<td>n</td>
</tr>
<tr>
<td>High</td>
<td>7</td>
<td>29.2</td>
<td>17</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>2.6</td>
<td>74</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>91</td>
<td>100</td>
</tr>
</tbody>
</table>

The results of the analysis of the relationship between the level of spirituality and the preventive behavior of HIV/AIDS transmission were obtained. There were 17 (70.8%) PLWHA who had a high level of spirituality, behaving positively in preventing HIV/AIDS transmission, while, among PLWHA with moderate levels of spirituality, there were 74 (97.4%) PLWHA who behaved positively in preventing HIV/AIDS transmission. The results of the statistical test obtained a value of \( p = 0.001 \), thus, it can be concluded that there is a significant relationship between the level of spirituality and the behavior of prevention of HIV/AIDS transmission.

### Discussion

The statistic test results between the variable level of knowledge and the prevention behavior of HIV/AIDS transmission showed no relationship between the two variables. The results of this study are in line with study that argues that high levels of HIV knowledge, are not enough to reduce the risk of sexual behavior, and consuming alcohol may increase sexual relations at high risk in the female population. Likewise, other study suggests that there is no significant relationship between the level of knowledge of HIV/AIDS and adolescent attitudes toward premarital sexual behavior. The same thing was also concluded by Astuti, who stated that there was no relationship between knowledge of HIV/AIDS and attitudes toward prevention of HIV/AIDS transmission. There are still possible other factors that influence the prevention behavior of HIV/AIDS transmission among PLWHA, including the strong peer influence. Eighty-seven percent (24) of respondents with low knowledge had negative behaviors in the prevention of HIV/AIDS transmission, and are at risk of transmitting to others, as the results of a study suggest that people with low HIV knowledge have a 47% higher chance of having sex under the influence of alcohol and have a 40% chance of having unprotected sex with their last three sex partners.

The results of statistical tests between variables of spirituality level and prevention behavior of HIV/AIDS transmission concluded that there was a relationship between the two variables. The spiritual values contained in religious teachings are a span of daily behavior, including understanding of commands such as in the Holy Qur’an: “And cooperate in righteousness and piety, but do not cooperate in sin and aggression. And fear Allah; indeed, Allah is severe in penalty.” This value is believed by the people and is a guide for them to avoid behaviors such as unauthorized and risky sexual relations, as a sin and violation, which will bring consequences if violated.

Adultery or sexual intercourse outside of marriage by changing partners is very high risk of transmission of HIV/AIDS. The prohibition on adultery is very real and firm: “And come not near unto adultery. Lo! it is an abomination and an evil way.” Likewise, the warning as well as the threat that states: “And those who cry not unto any other god along with Allah, nor take the life which Allah hath forbidden save in (course of) justice, nor commit adultery – and whoso doeth this shall pay the penalty.”

The spiritual values above clearly explain that adultery is forbidden, if a Muslim who obeys with a
high level of spirituality can have a greater chance of behaving positively toward the prevention of HIV/AIDS transmission, this can also prove the need for spiritual support for PLWHA. This is in line with Stacy, who conducted a systematic review of 137 studies and concluded that the level of risk of sexual HIV was lower among Muslims.16

Conclusion

The results of bivariate analysis through the chi-square test concluded that there was no relationship between knowledge with the prevention behavior of HIV/AIDS transmission, and there was a significant relationship between spirituality and prevention behavior of HIV/AIDS transmission. This research suggests that the healthcare team can facilitate services to increase knowledge about HIV/AIDS and improve the spirituality of PLWHA, which can be done through working with religious/spiritual institutions and figures such as clerics, clergy and others.

Ethical Clearance: The ethical approval for this study was granted by the IRB committee of the Faculty of Nursing at the Airlangga University in 2018.

Source of Funding: No funding supported this research, and the author used self-funding

Conflict of Interest: None

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